Economic Openness, Power, and Conflict

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ABSTRACT

Economic integration between major powers has long been viewed as a force for international stability. The intuitive logic is appealing: states that are trading with and investing in each other stand to lose if that commerce is jeopardized by conflict. Yet there are sound reasons for supposing that such deepening economic integration can also shift the balance of power between major states, by causing follower economies – states that are not among the most developed in the international system – to grow faster than leading economies, and economic size and development are what underpin national material capabilities. Moreover, a rich body of theory and history suggests that such shifts in the balance of power make interstate war more likely. This dissertation argues, therefore, that economic integration can actually be a potent cause of security competition and war. A theoretical framework that unites economic theory on the differential growth impact of trade, financial flows, and technology diffusion with realist arguments on the conflict implications of polarity shifts and dynamic power differentials is constructed. It is then explored using evidence from three key historical cases: the rise of the Dutch Republic during the 1581-1648 period, the relative decline of the United Kingdom and the relative rise of other great powers between 1870 and 1914, and the differential growth rates and corresponding tensions of 1945-89. Certain scope conditions and qualifications notwithstanding, the empirical evidence supports the theoretical framework. As such, the argument that deepening economic integration raises the mutual cost of fighting and thereby makes conflict less likely is not directly refuted, but an important countervailing mechanism is found to be at work. Such a finding has implications for debates over the security implications of economic globalization, the foundations of realist theory, and the causes and potential consequences of the rise of new powers today.

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But nothing seems more likely to establish…equality of force than the mutual communication of knowledge and of all sorts of improvements which an extensive commerce from all countries to all countries naturally, or rather necessarily, carries along with it.

- Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations*, 1775.

The privilege of historic backwardness – and such a privilege exists – permits, or rather compels, the adoption of whatever is ready in advance of any specified date, skipping a whole series of intermediate stages. Savages throw away their bows and arrows for rifles all at once, without travelling the road which lay between those two weapons in the past.

- Leon Trotsky, *History of the Russian Revolution*, 1932.

…a world market economy fosters the spread of economic growth throughout the international system. Through trade, foreign investment, and the transfer of technology, wealth and economic activities tend to diffuse from the old centers to new centers of economic growth. Enjoying the "advantages of backwardness"...these new centers frequently overtake and surpass the original center… they can adopt the most advanced and thoroughly proven techniques, whereas prior research-and-development costs and vested interests deter the more advanced economy from substituting the very latest techniques for obsolescent techniques. Thus, with lower costs, untapped resources, and equivalent technology, backward societies frequently can outcompete the more affluent society economically or militarily.

- Robert Gilpin, *War and Change in World Politics*, 1981.

I. Introduction

What is the impact of interstate commerce on patterns of international conflict and war? This is a question that has been of both scholarly and practical concern since the earliest days of inter-community economic exchange.[1] Moreover, this question has now taken on greater importance than ever before, due to a confluence of two factors. First, contemporary economic globalization has produced a world in which nation-states' economies are more integrated with each other than they have ever been. Second, despite the apparent muting of international security competition in the post-Cold War world, today's major states have attained a level of military capability sufficient to inflict death and destruction on other states' populations that is both unprecedented in human history and unrivalled by non-state actors. Bringing these two facts together presents a vital challenge for international relations scholarship: if international economic integration affects the likelihood of war between the international system's major powers, then its precise impact needs to be understood.

Such a finding paves the way for consideration of this dissertation's specific puzzle. Since the latter stages of the twentieth century and continuing in the early stages of the twenty-first century, we have witnessed the beginnings of a rapid shift in the distribution of total global wealth towards comparatively underdeveloped states, as their economic growth far outstrips that of the most developed states in the international system. Some of these countries, such as China and India, are so large that their total national economic output is likely to soon surpass that of the states – principally in Western Europe and North America, along with Japan – that accounted for the bulk of global industrial output throughout most of the twentieth century. Crucially, these rising states' development patterns suggests that much of their rapid growth owes to their integration into global trade and investment markets – a

[1] The quotations on the first page are, respectively, taken from: (Gilpin, 1981, pp. 178-179; A. Smith, 1976 [1775], pp. 141 (Book IV, Chapter VII); Trotsky, 2008 [1932], p. 4)

process usually known as economic globalization – which has in turn expanded their access to developed-world capital, skills, and technology.

However, less-developed economies catching-up with more-developed economies' levels of national output on the back of expanding international commerce is not unique to today. On the contrary, it is a pattern that has recurred many times before. Indeed, differential gains from international economic exchange represent one of the principal factors explaining the change in different states' relative levels of national economic output. Even a cursory glance through history shows broad macro-level shifts in both global and regional balances of economic power coming about as a result of less-developed states absorbing capital and technology from more-developed states through commerce. Moreover, a large body of economic growth theory offers plausible explanations for why this convergence result can come about.

It is this change in the balance of economic power that has historically been brought about by differential gains from international commerce that in turn gives rise to this dissertation's question. A rich body of liberal international relations theory has long argued that deep economic interdependence can act as a force for peace and stability between the major states. Yet another influential body of realist international theory attributes the war-proneness of the international system to the balance of power between the major states, with rapid shifts in the balance seen as likely to foster conflict. If economic integration and interstate commerce brings about rapid changes in the balance of material power between countries, could it not actually function as a cause of war rather than a source of peace? At the very least, it seems plausible that there could be two countervailing mechanisms acting against each other. As such, the principal question that this dissertation will address is: *Does a move towards deeper international economic integration foster a rapid change in international power configurations that subsequently results in an increased chance of major*

power war? Here, it is argued that this can indeed be the case. A corollary question for treatment at the conclusion of the dissertation is: *If so, what are the implications for international politics and national security policy in the twenty-first century?*

The Argument and Concepts

This dissertation makes a simple argument: that periods of deepening international economic integration foster the rise of new great powers, which in turn exacerbates interstate security competition and increases the likelihood of major war. Such an argument rests on three basic underlying causal steps. First, moves towards greater international economic integration expand three mechanisms – trade, cross-border financial flows, and technology diffusion – that can cause less-developed economies to grow faster than the most advanced economies of the age. Second, this differential economic growth changes the international balance of power, as newly-enlarged follower economies now have the wherewithal to procure significantly more capable military forces than they previously possessed. Third, this shift in the balance of power in favour of newly-rising major states can move the international system towards greater conflict proneness, by increasing the system's polarity (number of great powers), and by generating dynamic differentials that give both rising and declining states reason to fear each other.[2] Below, I outline each step in turn.

The independent variable (IV) in this dissertation's causal theory is economic integration: the level of economic interconnectedness between the significant states in the international system. In the contemporary era, this is a process that tends to be called economic globalization. Here, 'integration' is used more frequently than 'globalization,' for two reasons. First, globalization is a term with contemporary meaning that goes beyond the strictly economic sphere to encapsulate broader cultural and social processes relating to the

[2] This argument builds on the link between economic globalization and balance-of-power shifts identified in my previous academic work; specifically, my M.A. thesis: (Blagden, June 2008)

information transfer-driven compression of political space and the fragmentation of international boundaries.[3] But the theory presented here is preoccupied solely with the economic aspects of globalization, and operates with an understanding that globalization has not fundamentally altered the underlying nature of the states system.[4] It therefore makes only limited reference to the rich literature on globalization in its 'broad' sense. Second, this dissertation is interested in the impact on international stability of periods of economic globalization other than the most recent one, and while some scholars have used 'globalization' as a moniker for past epochs, others have not. Accordingly, integration is a more precise term that makes the full sweep of the theory's applicability clear – that is, *all* historical periods characterised by what we *now* call economic globalization – while simultaneously limiting the theory to economic-material rather than socio-cultural analysis. Nonetheless, it should be noted that the contemporary relevance of this dissertation lies in thinking about economic globalization, and the two terms are used in such a way as to render them essentially interchangeable throughout.

How, then, does the independent variable function? When the world moves towards greater economic integration, three processes are expanded: international trade in goods and services, cross-border financial flows, and international technology diffusion. Each of these mechanisms can cause the national economic output of follower economies – states that are not amongst the most technologically-advanced economies of the day – to grow faster than such lead economies. In the short to medium term, this can come about because the profits from trade and an influx of international finance boost the national capital stock, which is essential to maximising the level of output that can be generated from a given national pool of labour. In the longer term, all three mechanisms – trade, investment, and technology

[3] (Held, McGrew, Goldblatt, & Perraton, 1999, pp. 14-16)
[4] This dissertation's assertion that globalization and the states system are not antinomies, but that – on the contrary – the former takes place in the context of the latter corresponds approximately with that used in (Weiss, 1999, p. 60)

diffusion – can improve the national technological base, thereby boosting total factor productivity. Technological progress is the key determinant of long-run growth in all mainstream variants of economic growth theory: there is disagreement over whether such progress should be treated as exogenously-determined or as an endogenous component of the model, but not over whether technological progress is a key cause of growth. 'Technology' in this context does not mean simply the physical aspects of technology, but rather the progress in *human* technology – that is, the development of skills and know-how – that underlies improved productivity.

Why would these mechanisms differentially favour follower economies, resulting in these states' total national economic output catching-up with that of the leading states in the system? The simple answer is that copying is almost invariably cheaper, faster, and easier than innovating. Technological lead economies bear the cost and time burden of invention and innovation; for the advanced economies to grow, they must drive technological progress themselves. Follower economies, meanwhile, bear a much smaller share of the innovation burden, *provided* that the world economy is integrated. High levels of trade, cross-border finance, and international technology and knowledge sharing allow follower economies to quickly and cheaply absorb the skills, capabilities, and capital necessary to make rapid strides in productivity, thereby resulting in more rapid economic growth than in the leading economies. By contrast, if the world economy is less integrated, there is less trade, cross-border investment and technology sharing, and therefore less opportunity for follower economies' growth to outstrip that of the lead economies sufficiently for economic catch-up to take place.

The implications of this process for the balance of power are not hard to discern. If international economic integration has the potential to cause follower economies to grow at a rate that substantially outstrips that of lead economies, then those emerging states' total

national economic output can converge on that of the most developed state(s). If these rising states also happen to have large populations, then the result is that their economies can become amongst the largest in the international system. Since national wealth is the fungible resource that underpins national power, including the ability to procure military forces – which remain the *ultima ratio* of the anarchic international system – this is akin to saying that *international economic integration (globalization) can create great powers*.

Such a finding yields potentially important insights into the causes of major power war, the dependent variable (DV) in this argument. Structural realist theories of conflict derive their predictions for the war-proneness of the international system from assessment of the relative stability of different international power configurations. In particular, while uni- and bipolarity – systems of only one or two great powers – are comparatively peaceful (at least at the great power level), multipolarity – particularly if it becomes unbalanced in favour of one particular major state – is often more war-prone. This is because, under multipolarity, there are more potential great power conflict dyads, there is greater likelihood of significant power inequality, and most importantly, there is greater uncertainty over which states will balance against an emergent threat, due to all sides' incentive to pass the buck. Insofar as international economic integration can create great powers, this means that it can also shift the international system towards a more war-prone polarity configuration.

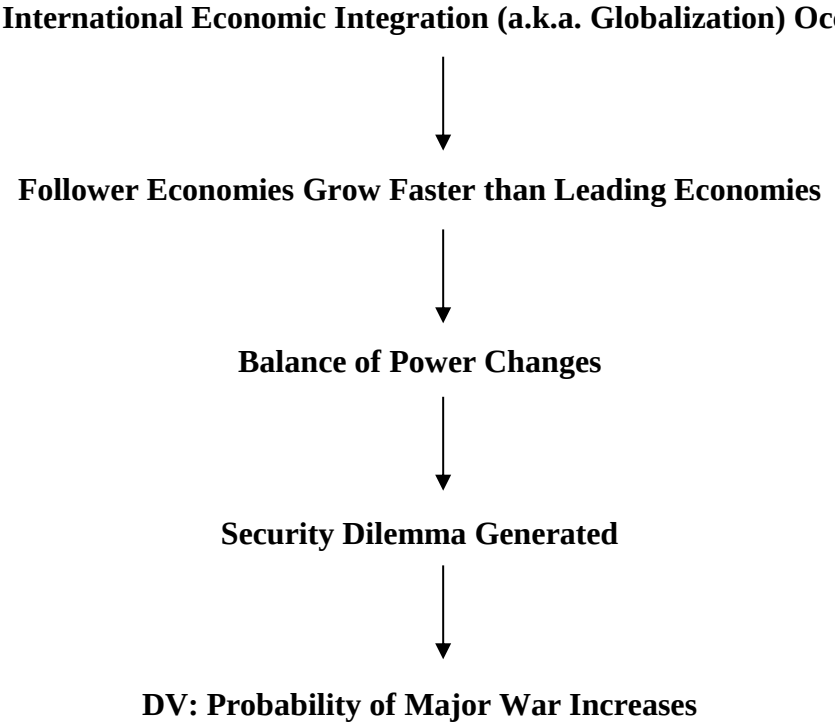
Moreover, these integration-driven power shifts can further raise the risk of major war by generating acute aggression incentives for the great powers. The economic catch-up process causes dynamic differentials in power growth between the major states: a necessary corollary to the relative rise of some powers is that others will be in relative decline. These dynamic power differentials generate sound strategic reasons for both types of state to fear the other. Declining states will know that as time passes, their ability to safeguard their vital interests against the possible predations of rising powers will wane, giving them incentives to

contain or retard the rise of the ascendant states while they still have the advantage. For their part, rising powers will be aware of this incentive structure facing declining powers, and also be aware that the best way to protect their own vital interests is to remove the ability of declining powers to threaten them as soon as possible. This dyadic process can thus generate an acute security dilemma: both rising and declining states have no intrinsic reason to want to harm the other, except for the fact that their desire to be secure against the other in the presence of relative power shifts gives the other good reason to fear them, and *vice versa*. In short, economic integration-driven power shifts have the potential to both elevate overall systemic war-proneness (by increasing polarity) and generate severe aggression incentives at the dyadic level (via the security dilemma produced by dynamic differentials). The overall theory – which the dissertation calls the integration-convergence theory of major power conflict – is summarised in figure 1.

Of course, the case can be made that 'the balance of power' is no longer a meaningful concept in such a deeply transnationalised world, which would render this dissertation's theory anachronistic and obsolete. Likewise, it can be argued that in a world where weak states and even non-state actors have done enormous damage (and could do immeasurably more with weapons of mass destruction), the balance of power is no longer important to international security considerations. Such positions contain some utility, and are relevant perspectives from which to analyse aspects of the modern world. However, nation-states remain the principal actors of international politics – both as an ordering framework, and as the possessors of unrivalled levels of destructive military capability – and as such, their power relationships continue to define both the structure and the stability of the international system. If major states ever again turn their full destructive wherewithal on each other, as they have repeatedly in the past, the human suffering unleashed will render all other subjects of study redundant. This dissertation is therefore justified in using a traditional conception of

the balance of power that focuses on the relative material capabilities of nations. Material power may no longer be the currency that openly defines the discourse of foreign policy, but it will remain the underpinning of world politics as long as humanity's global existence is organised as an anarchic system of sovereign states.

Figure 1. Integration-Convergence Conflict Theory in a Nutshell



Moreover, insofar as communities in the pre-modern era were organised as 'state-like' communities whose principal business was to look out for the community's collective interests, via armed force if necessary, this theory's applicability may stretch back into the pre-modern past. And insofar as the collectivisation of interest-protection along national (or at least sub-global) lines rather than under a single sovereign 'world state' seems likely to endure for the foreseeable future, the theory's applicability looks set to continue.[5] The

[5] Nationalism has been by far the most powerful political ideology in the world since the eighteenth century, and contemporary evidence – the ongoing proliferation of nation-states, bitterly fought secessionist movements and insurgencies, and the frequent vocal displays of patriotism in even the developed states of Western Europe and

conflict incentives generated by the security dilemma are not unique to the post-1648 'Westphalian' states system, as my 1581-1795 case study illustrates, and neither are the relative power shifts that can be brought about by inter-community economic exchange. As such, this theory cannot be dismissed as inapplicable to the pre-Westphalian era or as likely to be irrelevant in some post-Westphalian order that we may yet enter.

The dissertation therefore operates with a traditional materialist conception of a 'great power,' and maintains that this is the most valid use of the term even in the contemporary era. It defines great powers as states with the latent underlying economic wherewithal to generate sufficient military force to fight with a greater than 25 percent chance of success in an all-out *defensive* war against any other state in the international system, given at least a modest military build-up period.[6] Great powers must also possess the concomitant ability to pose an *offensive* military threat to at least one other state meeting this same criterion. Amongst these, some will be major powers that conceivably could defend themselves against any other state in the system, but have a geographical location within a sufficiently wealthy, and therefore strategically important, region of the world that leads them to be most geopolitically salient within – and preoccupied with – that region. Others are truly global great powers that are of geopolitical salience in every region of the world and could threaten any other state in the system individually, but are nevertheless incapable of exercising complete hegemony over other important regions due to the wherewithal of major powers within those areas.

North America – suggests that it will remain influential for the foreseeable future. (Hutchinson & Smith, 1994, pp. 10-12)

[6] This focus on underlying latent power resources differs from approaches that focus predominantly on current levels of realised military power: (Mearsheimer, 2001, p. 5) However, Mearsheimer's definition is less appropriate when considering both how the long-term power position of states evolves, and the related matter of how rising or declining states will pay at least as much attention to their rivals' levels of underlying wherewithal when considering the severity of the long-term security threat they pose. For example, on this metric, contemporary Japan is an Asian major power – and its neighbours will view it as such – despite its current low levels of defence spending (in proportional terms) and pacifistic constitution, since its aggregate national wealth and technological sophistication would allow it to rapidly develop much more capable military forces if it chose to.

Why It Matters (I): Implications for Theory

The arguments presented in this dissertation will contribute to three related areas of international relations scholarship, each of which has contemporary importance. First, the dissertation contributes to the nascent literature on the impact of globalization on international security. There are abundant studies of what social and cultural globalization might mean for levels of weak state, sub-state, and intra-state violence.[7] However, the impact of *economic* globalization on inter*national* relationships between the great powers – which are still ultimately the possessors of the greatest destructive capability in the world today – has remained comparatively under-theorized until recently. Stephen Brooks' 2005 book *Producing Security* represented the first major scholarly step in this direction, with his identification that the globalization of production – that is, the transnational dispersal of industrial processes via the foreign direct investment operations of multinational corporations – may have significantly reduced the economic benefits and feasibility of conquest.[8] Since then, other scholars have studied the impact of globalization on major power relations, but many have tended to conclude that it is both a force for stability and a force that serves the interests of the existing dominant state(s) in the international system.[9] Moreover, even those who have identified that economic globalization is driving a relative power shift *away* from the existing dominant states have still stopped short of analysing this process through a structural framework that considers the impact of such a polarity shift on the international system's propensity for war or peace.[10]

The argument presented here, by contrast, suggests that economic globalization may actually lead to the opposite result from that predicted by those in Brooks' camp who see it as a force for stability in major power relations. This dissertation's hypothesis does not directly

[7] For a seminal work in this vein, see (Kaldor, 2006) For overviews, see (Baylis & Smith, 2005; Held et al., 1999)
[8] (Brooks, 2005)
[9] (Kirshner, Fall 2008)
[10] (Chari, 2008, p. 2; Hurrell, 2007, p. 215; Wolf, 2004, p. viii)

challenge Brooks' logic, but it suggests a powerful countervailing mechanism. While deep economic integration of the kind identified in *Producing Security* may indeed reduce the benefits of conquest, a large body of international relations theory shows that rapid and substantial changes in the balance of power between major states can be a potent contributor to systemic war-proneness. Accordingly, in testing this dissertation's theory, we will also be posing a question to those who see contemporary economic globalization as a pacifying force.

Following directly from this debate about the impact of contemporary globalization on international security is a wider and older debate. There has long been an exchange between those who see deep economic interdependence as likely to foster peace and those who see such interdependence as largely irrelevant and unlikely to serve as much of a check on major powers' national security calculations. Moreover, there has been a narrower section of theorists who have posited that certain types of expectations about future trade patterns could actually serve as a source of conflict – say, if states are presently highly integrated but expect their trade to be curtailed, leading them to pursue military options to maintain access to resources that they hitherto acquired through peaceful commerce.[11] This dissertation's argument speaks directly to this exchange by demonstrating that this latter category of theorists could be correct, although not for the reasons hitherto suggested. Quite simply, if a move towards greater economic integration brings about a rapid shift in the balance of power, then deep economic interdependence may actually serve as a *cause* of war, rather than as a barrier.

Finally, the implications of this exchange widen further still, to encapsulate the broader questions of the international relations theory debate. If economic integration can be a cause of war, rather than a promoter of peace, then one integral branch of liberal

[11] (Copeland, Spring 1996)

international theory is called into question. At the same time, competing approaches may be bolstered. Structural realist theories of international politics have long been accused of lacking dynamic micro-foundations: realists may have a good account for why polarity or dynamic differentials matters for international stability, but since they have no explanation for why polarity itself might shift, they also have no explanation for why the international system might come to be more war-prone at time *B* than it was at time *A*. The argument presented here, by contrast, connects power change in the international system – which at its heart is to do with shifts in relative productive capacity and national wealth – back to a measurable and generalizable feature of the international economic order, namely, changes in its level of openness. Without an account of economic change, structural realist theory is hopelessly endogenous: international conflict is a product of the balance of power, yet the balance of power is itself altered by international conflict. Yet with an account of economic change, structural realism's explanatory power may be restored. Moreover, my argument is entirely consistent with neoclassical realist theoretical approaches, since – despite their focus on domestic political imperatives as an intervening variable between the international system and states' strategic choices – neoclassical realists also attribute a significant underlying causal role to structural pressures. As such, it should not be seen as asserting the sole 'correctness' of 'pure' structural theory, but rather as a theory that can help to elucidate the dynamic micro-foundations of any argument about international politics that retains a substantial structural component.

Why It Matters (II): Implications for Contemporary International Politics

While this dissertation has important theoretical implications, theory itself is most useful when it yields important insights into the real world. Accordingly, it is important to consider the practical value of this dissertation in terms of how well it elucidates salient

aspects of contemporary world politics. The rapid contemporary rise of China, India, Russia and Brazil (the so-called 'BRICs') is being driven by economic globalization, in the sense that the requisite transfer of technology and capital, and subsequent convergence of national wealth, would be less likely to occur in a more closed global economy. Moreover, this is a trend that is likely to continue through the long-term, barring some fundamental upheaval, and the subsequent result is likely to be a shift towards greater multipolarity and significant dynamic differential power growth between the world's major states. The possible decline of the three European Union (EU) major powers (Germany, France and the United Kingdom) vis-à-vis Russia in Europe, the relative decline of Japan and the United States vis-à-vis China in Asia, and the eventual emergence of a three-state top tier of great powers (the United States, China and India) within a nine major power system (the G5 and the BRICs) are all plausible events by 2050. The theory presented here suggests that such developments have been brought about by economic globalization, and that they should give cause for concern, since a shift towards greater multipolarity and dynamic relative power change both make international conflict more likely.

Following from this, there will also be important conclusions to be derived for national and international security policy. If the dissertation does indeed show that conflict can be rendered more likely by deepened international economic integration – but also that a defence-favourable offence-defence balance (say, mutual nuclear deterrence), international institutions, or more familial interstate relations reduce the likelihood of states actually acting on their aggression incentives – then this is a finding that merits consideration as policymakers contemplate how to best handle a multipolar twenty-first century. It would suggest that recent Western grand strategies of direct military intervention around the globe may become decreasingly feasible, with all states likely to have to pay more attention to avoiding confrontation and conserving national power resources so as to remain capable of

guaranteeing their core security and wellbeing. It would also suggest that the current drive to rid the world of nuclear weapons may prove a double-edged sword, since a secure second-strike nuclear arsenal is perhaps the most reliable way to definitively tilt the offence-defence balance in favour of the defence and thereby make both rising and declining major powers more secure in their ability to safeguard their sovereignty and survival.

Methodology and Case Selection Criteria

The principal method of testing the theory in this dissertation will be analysis of historical case studies. Analysis of this kind is appropriate for a number of reasons: it allows underlying causal mechanisms to be exposed in a way that large-*N* statistical correlations do not, it permits all competing explanations of an observed outcome to be weighed and assessed, and it enables us to study rare-but-important events, such as major wars.[12] That said, in conducting this sort of research, we must guard against the risk of selecting cases on the dependent variable; that is, only choosing to analyse historical examples where the outcome is the one that our argument predicts, with the effect that we effectively choose only cases that suit our theoretical claims.[13]

Accordingly, in selecting cases, this dissertation picks instances where a period of deepening economic integration drove a significant dynamic change in two or more states' relative material capabilities. The cases are then scrutinised to assess whether an escalation of interstate security competition resulted from this power shift. So, to put it in methodological terms, the cases studied must display at least a degree of constancy on the independent variable: if there is no international economic integration, then the case cannot be considered a test of the purported causal mechanism. However, it is just as important to choose cases that display variance on the dependent variable, in order to ascertain exactly what set of

[12] (George & Bennett, 2005, pp. 3-36)
[13] (King, Keohane, & Verba, 1994, pp. 100-105)

parameters (if any) brings about the predicted theoretical result and in order to avoid the problem of choosing only examples that seem to prove the theory's point while ignoring those that do not. For this reason, the cases chosen cover an array of different types. One is an easy test: it illustrates the purported mechanisms at work exactly as the dissertation predicts, and is thus close to the theoretical ideal type. Others are hard tests: cases where the independent variable functions as postulated, but where the outcome is either partially or wholly contrary to the predictions of the theory. Such cases merit especially careful consideration, since it may be that they simply illustrate the theory's scope conditions and parameters, but it could also be that they actually falsify the theory. The possibility of falsification occurring is a crucial hallmark of robust explanatory theory: if an argument cannot ever be proven wrong, we can never really be sure how much explanatory power it *does* possess. Accordingly, the case analysis proceeds with this awareness in mind. Finally, some cases also represent crucial tests: cases that are so important that an inability to account for them would cast doubt on the explanatory power claimed by the theory. Of course, crucial cases can be either easy *or* hard, so they do not represent a third discrete category; rather, such cases must be considered irrespective of the ease with which the theory can account for them.

The three cases for consideration are the 1581-1795 early modern European international system (divided into pre- and post-1674 phases), the 1870-1914 Euro-centric international system, and the 1945-89 global – albeit still Euro-centric – international system (divided into pre- and post-1973 phases). Each case study proceeds through three stages. First, the evidence of economic integration is considered, in order to outline how the independent variable operated. Crucially, each case displays a shift from less to more international economic integration, as the theory requires. Second, the effect of this integration on the balance of power is considered, with special attention being paid to the

geopolitical implications of the concerned states' relative power shift. Finally, the outcomes are looked at. Did outright major war ensue? If not, was there nonetheless an exacerbation of the security dilemma and a deterioration of major power relations? If so, what stopped this situation turning into 'hot' war?

Throughout the historical analysis, cases are subjected to both congruence and process-tracing tests.[14] The former seeks to compare the values of the independent and dependent variables actually observed in the cases to the values predicted by the theory.[15] Put simply, did the outcome that the theory said should come about actually come about in reality? If it did, then the empirical data is congruent (consistent) with the theory, but if the theory and evidence are incongruent, then the purported theoretical mechanism starts to look circumspect. It is at this point that process-tracing becomes valuable.[16] This is a within-case method that seeks to track the intervening causal processes and variables between the independent variable and the dependent variable. If a case proves incongruent with the theory and process-tracing reveals that intervening causal mechanisms contrary to those predicted by the theory were at work, then this represents a major step towards falsification. By contrast, if a case is both congruent with the theory and process-tracing shows that the mechanisms predicted by the theory did in fact operate, then this strengthens the theory. In cases where the two types of test point in opposite directions – either congruent outcomes but contrary processes, or consistent processes but incongruent outcomes – then these cases must be evaluated to see whether the theory is in fact being falsified, or whether it merely needs to be further qualified with alternative intervening variables and scope conditions.

[14] The aspiration of structured, focused comparative case analysis is to pick cases that are similar in *every* respect but one: (George & Bennett, 2005, pp. 67-72) However, because epochal events such as eras of globalization and systemic wars are rare, fully meeting this aspiration would be difficult, given this dissertation's topic, because each case differs from the others in *more than one* important way. As such, the case analysis certainly strives to be as structured and focused as possible, but relies on the combination of congruence and process-tracing as its underlying pillars.

[15] (George & Bennett, 2005, pp. 181-204; King et al., 1994, pp. 45-46)

[16] (George & Bennett, 2005, pp. 205-232; King et al., 1994, pp. 85-87, 225-228)

What of the historical periods and regional systems that are not covered by the cases? After all, great power wars have occurred outside these three periods: does that mean that the theory lacks meaningful explanatory power, if variance on the independent variable is met with constancy on the dependent variable? The three cases chosen represent major expansions of international economic integration; ones that saw a step-change in levels of trade, financial flows, and knowledge diffusion compared to what went before. But this is not to suggest that there was not meaningful variation in levels of international economic exchange that may have produced relative power shifts and a commensurate increase in security competition between major states at other times. And as will be stressed throughout the dissertation, integration-convergence conflict theory does not profess to be a master theory that explains all great power wars – indeed, any theory that claimed such explanatory reach should be treated sceptically – so the fact that major wars have occurred in periods not characterised by an expansion of economic integration, for all sorts of reasons, does not falsify the theory. As will be discussed in Chapter IV, falsification may occur if economic integration deepened in a given period but there were no growth (and thus power) differentials, *or* if integration did *drive* a relative power shift but there was no noticeable uptick in security tensions as a consequence.

Case Findings

The cases are ordered chronologically, with the first period for consideration being early modern Europe between 1581 and 1795 (sub-divided as two phases: 1581-1674, the principal focus, and 1674-1795). In 1579, the seven northernmost provinces of the Spanish Netherlands formed the Union of Utrecht, a defensive alliance to protect their interests against the Habsburg imperial masters that they had rebelled against in 1567-1572. Two years later, they declared their independence as the Republic of the Seven United Netherlands. As

an independent state, the Dutch integrated deep into the hitherto Spanish, English and Scandinavian-dominated international economic order. Dutch merchants and shipping firms increasingly competed with (and eventually displaced) their English counterparts on the lucrative northern European routes to the Baltic and Russia-via-Norway.[17] Likewise, the *Vereenigde Oost-Indische Compagnie* (Dutch East India Company) integrated deep into Southeast Asian commerce, at the expense of Spanish and especially Portuguese interests.[18]

Of course, as a mercantilist era of vying national monopolies, the 1581-1674 era does not closely resemble the modern international market system. Nonetheless, integration into the international economic order of the time transformed what had been a mere rebellious imperial possession into a European great power.[19] Despite its small size in terms of population, the Dutch Republic's commerce-derived wealth and technological gains meant that by 1619, it was in a position to pledge armed assistance and financial support to Frederick V's Protestant insurgency against the Holy Roman Empire and its backer, Spain. In doing so, the newly-empowered Netherlands picked a fight with Europe's principal military power, played a role in instigating the first true Europe-wide systemic conflagration, and ultimately secured diplomatic and strategic gains for the Republic via the settlement reached at the 1648 Treaty of Westphalia.[20] From the late seventeenth century, however, the deepening integration of other modernising states into the then-Dutch-dominanted international economic system resulted in the relative rise of others, most notably Britain and to a lesser extent France, as goods, knowledge, and most importantly capital flowed to these then-less developed economies with significant catch-up potential.

The second case for consideration is the period 1870-1914. This period begins immediately before the Unification of Germany, and ends with the outbreak of World War I.

[17] (Findlay & O'Rourke, 2007b, pp. 176-177)
[18] (Findlay & O'Rourke, 2007b, pp. 177-183)
[19] (Findlay & O'Rourke, 2007b, pp. 185-186)
[20] (Israel, 1995, pp. 465-469)

As an era of international economic integration, this period was unprecedented, and on some metrics – such as mass long-term labour migration – remains unsurpassed. In 1880, the United Kingdom still accounted for 22.9 percent of world economic output, compared to the United States' 14.7 percent and Germany's 8.5 percent. Yet by 1913, the United Kingdom's share of world manufacturing output had declined to 13.6 percent, while the United States had achieved 32.0 percent and Germany 14.8 percent of the total. Furthermore, the third-most significant European power – France – declined from a position of near-parity with Germany (7.8 percent of world manufacturing) in 1880 to less than half the economic output (6.1 percent) in 1913.[21] Japan and Russia also experienced rapid industrialisation during this period, albeit to a lesser extent, and became increasingly major powers in the process.

While industrialisation certainly required domestic drive, the rise of all of these states was made possible by the deepening international economic integration of the time.[22] Germany benefitted from its participation in global trade, investment flows from the United Kingdom and other financial centres, and leading-economy technology diffusion. The United States was less involved with international trade, but also benefitted extensively from technology diffusion, financial flows, and labour mobility. These sharp changes in relative shares of global wealth drove a polarity shift in Europe (the ascendance of Germany and Russia) and East Asia (the emergence of Japan), as well as producing marked dynamic power differentials between the major states. These processes in turn played a pivotal role in the causation of two major power wars: the Russo-Japanese War of 1904-1905 and, even more significantly, World War I. Moreover, insofar as World War II can partly be considered a product of the 'unfinished business' left by the political settlement that ended World War I, the case has relevance by extension to both of the pivotal systemic conflicts of the early twentieth century.

[21] (Kennedy, 1987, p. 202)
[22] (O'Rourke & Williamson, 1999, p. 3)

The final study focuses on a harder case for the theory: the Cold War period, broken – like the early modern case – into its 'first' and 'second' phases. This is a case that appears to cut against the predictions of the core theory, insofar as no large-scale direct force-on-force major power warfare ensued. Nonetheless, the Cold War world saw distinct shifts in levels of economic openness. Accordingly, it is an important case that displays a degree of constancy on the independent variable but – compared to the other cases – variance on the dependent variable. A number of complexities are apparent in the case: one of the two greatest powers in the international system largely 'opted out' of the developed-world economic order, many of the other major powers were bound into a tight-knit, institutionalised security community in the face of a common threat posed by the other bloc, and so forth. These complexities will be investigated fully in Chapter VII. Nevertheless, I contend that this case does not falsify my theory. The most integrated that the Soviet economy ever was with the leading developed economies was before, during, and immediately after World War II itself: the United States and United Kingdom supplied substantial amounts of technology and capital to their ally (particularly after 1941), while victory allowed the Soviet Union to transfer large quantities of German and Japanese industrial plant back to Russia in the late 1940s. This paved the way for significant catch-up growth strides in the 1950s and 1960s, which prompted acute concern over Soviet power growth in the United States and its allies, and resulted in a period of intense mutual hostility and tension now recognised as the 'first' Cold War. Meanwhile, the non-US G5 states (Japan, West Germany, France, and the United Kingdom) also experienced strong catch-up growth towards US development levels during this period, and the post-1945 (re-)expansion of trade, financial flows, and technology diffusion – both market-driven and government-directed (that is, the Marshall Plan) – was a key cause of this. Given the scale of the Soviet threat, these

states remained locked into a mutual US-led alliance network, but at least in terms of the economic process, the case is consistent with integration-convergence conflict theory.

Likewise, by the 'second' Cold War (1979-1985), the relative power trajectories were running the other way: the Soviet Union's insularity as the only major industrial power shut off from the global trading order caused its economy to stagnate and then fall further behind, since even the most extensive efforts to acquire advanced technology via duplicate development and espionage were inevitably less efficient than the free market exchange of goods, capital and ideas seen in the Organisation for Economic Cooperation and Development (OECD). At this point, the Soviet Union became the declining power vis-à-vis the United States, West Germany, China, and Japan – the rise of the latter three having been brought about in the preceding two decades by integration-facilitated convergence with the US lead economy – and again, relations deteriorated.[23] Moreover, at this time, many in the United States became concerned about the rise of Japan, while France and the United Kingdom worried about the power of a united Germany, given the Federal Republic's economic dynamism. In other words, there is evidence from this period that economic integration-driven relative power shifts again caused an uptick in major power security tensions. Figure 1, Chapter VIII, summarises the findings of all three cases in the context of their fit with the theory.

In concluding, the dissertation will turn to the contemporary era of economic globalization that had its first seeds in China's 1978 economic opening, that gained momentum following the end of the Cold War in 1989, and that accelerated throughout the mid-to-late 1990s and 2000s. Of course, as a case study, we do not know how the current era of globalization ends. Nonetheless, it is an outstanding case from the perspective of considering the impact of economic integration on the balance of power. Moreover, it is

[23] (Crafts & Toniolo, 1996, pp. 22-23; Maddison, 1991, p. 130)

possible to study the impact that shifts in the balance of power are having on the tenor of major power relations, the prevalence of militarised international disputes and diplomatic crises, and so forth. As such, given its contemporary policy relevance and its confluence of economic and strategic factors, the contemporary wave of globalization appears to offer further support to integration-convergence conflict theory.

The Plan of the Dissertation

The dissertation proceeds as follows. In the chapter immediately following this one (Chapter II), the relevant economic theory is examined, with an explanation provided for how a shift to deeper international economic integration can bring about a change in the balance of power. Next, the two strands of structural realist theory – polarity and dynamic differentials – that explain how this shift in the balance of power can generate conflict incentives and make the international system more war-prone are laid out (Chapter III). The final theoretical chapter (Chapter IV) draws the theory together, considers how it relates and contributes to existing strands of literature, and explains the theory's scope conditions and limitations. Chapters V to VII comprise the three historical case studies described above. The conclusion (Chapter VIII) takes stock of what has been learned, draws together and summarises the case findings, and considers what the findings mean for international relations theory, twenty-first century world politics, and contemporary national security policy.

II. Integration-Convergence Theory: Economic Foundations of the Changing Balance of Power

As discussed above, my argument operates with an understanding that the *ultima ratio* of world politics is military power.[1] This is because, in an anarchic international system that lacks a higher enforcement authority, a state's ability to safeguard its vital interests will depend on what it can do – both defensively and offensively – using force of arms; it is fundamentally a self-help world.[2] Accordingly, in discussing how the 'balance of power' affects the international system's propensity for conflict or cooperation, the discussion ultimately focuses on the relative distribution of military potential between states.[3]

However, despite this broad orientation, the underlying source of military power potential is what matters most for my argument – and the most fungible power resource available to states is national wealth.[4] More specifically, total usable economic power resources are some function of aggregate economic size and per capita development levels. An economy that is large but has low development levels has to devote most of its output to subsistence needs, such as food,[5] while an economy that is highly developed but small will have a usable surplus that is large relative to its economy but small relative to bigger states, meaning that the two are partial substitutes and the greater the sum that they produce in combination, the more powerful a state's overall material base will be.

Some studies focus on the independent role of population or technological sophistication in producing military prowess, and there is certainly something to be said for

[1] (Waltz, 1979, p. 113)
[2] (Mearsheimer, 2001, pp. 32-33)
[3] Note too that when this dissertation discusses 'the balance of power,' it is referring to a fact, rather than a theory or policy. It is not claiming that the international system tends towards a Balance of Power (a theory), or that statesmen should seek to bring about a Balance of Power (a policy) – although this latter point could be a valid policy inference, as will be touched on in Chapter VIII – but simply that there will always be *a* balance of power, meaning the distribution of material capabilities throughout the system. It is thus not in conflict with recent research that demonstrates that the international system, particularly looking beyond the modern Euro-Atlantic system, does *not* necessarily tend towards Balance: (Wohlforth et al., June 2007) (On the argument that the system *does* tend to induce balance, see (Waltz, 1979, pp. 126-127))
[4] (Knorr, 1975)
[5] (Mearsheimer, 2001, p. 62)

this approach.[6] States with only a small number of people struggle to achieve military great power status, given the necessity of manning capable armed forces, while even wealthy states may suffer a long lag period between acquiring their economic power and their military technology catching up with that of leading powers.[7] Nevertheless, national wealth still does a reasonable job of subsuming these other factors.[8] It thereby serves as the best single proxy for overall national power, insofar as it represents the underlying bedrock of both current and potential military capability. After all, a wealthy state, in the aggregate sense, is likely to be so because it has a large population and sophisticated technology. Furthermore, if it does not, it can use its wealth to address the problem: manpower-efficient technology can substitute for people, especially in the modern era, while military-technological inferiority can be overcome through procurement abroad, importation of skilled people, and intensive research. Finally, wealth gives a flexibility to state capability that other power resources may not (for example, a large military force can be rendered obsolete by sudden technological shifts); accordingly, economic power is also a hedge against future strategic uncertainty.

Economic might is thus the fundamental determinant of a state's abilities and status.[9] As such, in considering the effects of economic integration in the context discussed here, what matters is how it affects states' relative economic resources. Of course, latent economic capability does not force a state to spend a lot on defence or act like a 'normal' great power in the short term: a combination of systemic or domestic factors may converge to prevent this, as they did in the nineteenth-century United States and Cold War Japan and West Germany.[10] Yet a state that does not have wealth cannot be a great power: economic capability underpins the broader ability of all states to accomplish their goals.[11] More importantly, however, a

[6] (Waltz, 1979, p. 131) In an applied context, see also (Segal, 2006, p. 310)
[7] (Kennedy, 1987, p. xxiii; Krepinevich, Fall 1994)
[8] (Kennedy, 1987, p. xv)
[9] (Kennedy, 1987, p. xv)
[10] (Zakaria, 1998) See also (Mearsheimer, 2001, p. 382)
[11] (Mearsheimer, 2001, p. 62)

state with the economic prerequisites will struggle to *avoid* acting as a great power in the long term, not least because other states will treat it as being one. A state with considerable latent capability is more likely to be feared, fuelling a feed-back relationship of mutual suspicion and commensurate arming, thus creating a security dilemma.[12]

The Economics of Aggregate National Wealth Convergence

The core argument of this dissertation is that periods of international economic integration change the balance of power between major states, which in turn generates incentives for those states to come into conflict.[13] Economic integration – a political variable, given that states have to choose whether or not to engage in it – is characterised by expanded levels of international trade in goods and services, cross-border financial flows, and international technology transfer. Insofar as the balance of power is contingent on the balance of material wealth, therefore, we must first consider how international integration can differentially impact states' economic growth rates. Accordingly, the dissertation here lays out some core principles of growth economics, before describing how these three principal features of international economic integration – trade, financial flows, and technology diffusion – can drive a convergence process that allows less-developed follower economies to catch-up with technological leaders in terms of national wealth. It must be stressed that it is far beyond the scope of this section to attempt to adjudicate all outstanding debates in growth economics, which naturally remains a field of considerable theoretical and empirical contestation. Rather, this chapter merely attempts to offer an uncontroversial and plausible account of how the three principal features of economic integration – elevated trade, elevated

[12] On such security dilemma dynamics, see (Jervis, October 1978)
[13] The arguments in this section draw on my own prior research, including my M.A. thesis at the University of Chicago. For the most developed previous incarnation, see (Blagden, 2008)

financial flows, and elevated technology and knowledge transfer – may drive a convergence process under mainstream growth theory.

For the argument to work, the dissertation must demonstrate ways in which economic integration can cause GDP (gross domestic product) to grow faster in follower economies than leaders, resulting in a changed balance of power. GDP represents a measure of the final market value of all goods and service produced within a state in a given year, and can be presented as: *GDP = Consumption + Gross Investment + Government Spending + Net Exports*.[14] It is a reasonable proxy of national wealth, and is used as such in economic growth literature. Many in the international relations community have tended to focus on GNP (gross *national* product), which has the advantage of including economic output produced by a state's citizens working abroad.[15] However, the economic growth literature tends to focus on GDP, and I therefore adopt this approach in this chapter also (although in later empirical chapters, I may refer to GNP where this is the data most readily available). Ultimately, it is not a particularly important distinction for my theoretical argument, since GDP and GNP are unlikely to differ so substantially that a state would be a great power on one measure but not on the other.

Follower economies are states that are not themselves at the cutting-edge of technological innovation and associated per capita productivity, but rather tend to duplicate the most recent technologies and practices developed in the leading economies. For illustration, the leading economies in today's world are the more advanced members of the OECD. Due to follower economies' technological and associated productivity lag, they tend to have lower GDP per capita, barring a large natural resource endowment.

[14] GDP can be compared between states at market exchange rates or at purchasing power parity (PPP). The former is more applicable when considering a state's ability to procure top-end military technology and resources off the world market; the latter is more appropriate when considering a state's ability to mobilise its own internal resources for strategic purposes.
[15] (Mearsheimer, 2001, p. 62)

At an intuitive level, the finding that economic integration facilitates a higher GDP growth rate in follower economies that, if sufficiently superior to the growth of the pre-existing lead economies, can result in catch-up convergence seems plausible: the removal of economic barriers between countries will, logically-speaking, remove some of the barriers facing economic laggards.[16] Yet this finding can be unpacked further to reveal its constituent mechanisms, insofar as the trade, financial flows and technological diffusion embodied in economic integration can operate to produce follower economy growth that is sufficiently fast to result in per capita convergence, provided that the states in question respond to it effectively. It should be noted here that since empirical support for the convergence hypothesis is only limited – at least *between* 'tiers' of economic development, as opposed to *within* similar-country 'clubs' – this dissertation is *not* asserting a 'strong' convergence prediction that globalization will *necessarily* lift all boats. Rather, it is simply asserting that deeper integration creates the *opportunity* for follower economies to grow faster than leaders, and that certain well-organised follower states will take advantage of this opportunity to grow sufficiently faster than leading states for their GDP to catch-up in aggregate terms.

The reason that these integration mechanisms can have this effect is that they affect the constituent drivers of economic growth. The simple growth accounting equation is:

$$\Delta Y/Y = \alpha \Delta K/K + \beta \Delta L/L + \Delta A/A,$$

where the growth rate of GDP (Y) is accounted for in terms of the contribution of the growth of the capital stock ($\Delta K/K$) multiplied by the elasticity of output with respect to capital (α), the contribution of the growth of the labour force ($\Delta L/L$) multiplied by the elasticity of output with respect to labour (β), and the growth of total factor productivity, TFP ($\Delta A/A$).[17] Put simply, this means that the factors contributing to the rate of economic growth are growth of the capital stock (that is, durable goods used as factors of production), growth of the labour

[16] (Wolf, 2004, p. 42)
[17] (Crafts, March 2000, p. 20)

supply, and improvements in TFP. TFP is essentially a residual that represents productivity increases not directly attributable to growth of capital or labour, making it a proxy for technological progress. Technology here is defined broadly to include knowledge and human capital as well as physical technologies; after all, improvements in the latter are underpinned by the former. In considering the convergence effects of international economic integration, therefore, we must consider ways in which the three mechanisms described can cause one or more of the growth factors identified by the above equation to expand more rapidly in follower economies than their leading counterparts.[18] Note that once catch-up is fully complete, the convergence effects of integration are exhausted. However, since all large states cannot simultaneously be *the* most advanced economy in the world, in practice there are always likely to be power shifts between major states produced by the convergence mechanism.

There are two principal types of competing economic growth theory: the neoclassical (Solow-Swan) growth model and the endogenous growth model.[19] These models underpin the general growth equation outlined above, by providing mechanisms through which improvements in the growth components can actually come about. In the neoclassical model, growth in the short-run comes about through the expansion of the capital stock, via investment, which expands labour productivity. In the long-run, the capital stock reaches an optimal point – the 'steady state' level – after which the growth benefits of additional accumulation are less than the costs due to diminishing marginal returns.[20] In the steady state, the sole determinant of economic growth is technological progress. It should be noted, however, that for developing countries with a pre-steady state capital stock, the 'short run' in question can be quite long. Furthermore, if this capital accumulation facilitates a shift of large

[18] For an assessment that supports the overall convergence hypothesis but notes important corollary factors that affect the extent to which it has held across different time periods, see (Abramovitz, June 1986)
[19] (Barro & Sala-i-Martin, March 1997, p. 1) For more detailed empirical consideration of this pivotal article's arguments, see (Barro, 1997) For a precursor to the article, see (Barro & Sala-i-Martin, October 1995)
[20] (Barro & Sala-i-Martin, 2004, pp. 23-84)

proportions of the labour force out of subsistence agriculture – where the marginal product of labour is close to zero – then the growth effects of this capital accumulation are likely to be dramatic; this is a particularly important result when we consider developing economies.

In the endogenous growth model, by contrast, technological progress is not only the driver of long-run growth (as in the neoclassical model), but is also explained within the theory: the private profit that flows to an innovator results in commercial research and discovery, leading to a Schumpeterian process of 'creative destruction.'[21] Endogenous growth theories have been seen as carrying weaker (or even non-existent) predictions of convergence in the presence of international economic openness than neoclassical theories (a weakness for endogenous models, given the empirical support for the convergence hypothesis).[22] However, some recent work finds that endogenous models are also consistent with economic openness creating the possibility of faster GDP growth in follower economies than leaders, provided that the developing states in question meet a number of other requirements.[23] Either way, synthesising the two models suggests that short-run growth may be driven by capital accumulation, while in the long run, growth depends on the discovery of new products, technologies and practices in the leading economies, which innovate due to the endogenous profit incentives described.[24]

As stated above, it is clearly far beyond the scope of this paper to attempt to adjudicate all outstanding debates in growth economics. Rather, here an attempt is made to point out various features of the three economic integration processes – trade, financial flows, and technological diffusion – that are broadly accepted to play at least some significant role in the growth process, via their effects in one or both of the models detailed above.

[21] The seminal early work in this field was (Romer, October 1986) See also (Lucas, July 1988) On the practical relevance of Schumpterian creative destruction for contemporary global growth, see (Wolf, 2004, p. 42) For an overview, see (Barro & Sala-i-Martin, 2004, pp. 205-284)
[22] (Leung & Quah, December 1996, pp. 535-536)
[23] See (Barro & Sala-i-Martin, March 1997) See also (Leung & Quah, December 1996)
[24] (Barro & Sala-i-Martin, March 1997, p. 2)

Convergence Driver 1: Trade

A high volume of international trade in goods and services is a defining feature of all eras of economic integration, including the present one.[25] The most immediate way in which a move to expanded free trade can improve growth is simply by improving economic efficiency: if states move from atomised national markets to a single market, they can specialise according to their comparative advantage, along with reaping economies of scale.[26] This 'one-shot' efficiency gain of moving from closed to integrated has growth effects that may yield extensive GDP catch-up gains.[27]

Beyond these basic efficiency gains, however, there are good reasons to suppose that trade can lead to per capita income convergence.[28] Indeed, David Dollar and Aart Kraay assert that, 'Openness to international trade accelerates development: this is one of the most widely held beliefs in the economics profession, one of the few things on which Nobel prize winners of both the left and the right agree.'[29] Insofar as trade efficiency raises national income, there are subsequently more funds – firms' profits and individuals' savings – available for investment. This can lead to capital accumulation, which can in turn foster growth by raising the productivity of labour (especially if large numbers of workers leave subsistence agriculture).[30] In the long run, further capital accumulation will suffer from diminishing marginal returns, yet for developing economies – especially if they have massive pools of agricultural labour – the 'short run' can last for many decades.

More fundamentally, there are ways by which trade can alter the steady state rate of long-run growth. First, exposure to greater competition – a necessity when entering the global

[25] (Crafts, March 2000, pp. 25-26)
[26] (Krugman & Obstfeld, 2006, pp. 24-47)
[27] (Winters, February 2004, p. F5)
[28] (Santos-Paulino & Thirlwall, February 2004, p. F1)
[29] (Dollar & Kraay, June 2001, p. 1) For an overview of three different strands of thinking in this vein, see (Gruber, May 2011, pp. 631-633)
[30] (Winters, February 2004, p. F6)

market – will place greater competitive pressures on domestic firms. Second, participation in the global marketplace – particularly the extensive import of developed world products – exposes domestic economic actors to cutting-edge ideas and technologies, and also overcomes the problem of a small domestic economy making industrialisation inefficient.[31] The result of these two factors may be that technological innovation – or, in the case of follower economies, technological *adoption* – is stimulated, while additional productive inefficiencies are competed away: firms must adopt leading technologies or be wiped-out.[32] The second factor is particularly important: trade can be conceived as an indirect means by which follower economies access leading economies' accumulated research and development (R&D) efforts – their accumulated technology and know-how – raising their TFP.[33]

Openness to trade is particularly important for follower economies, since it removes barriers to convergence. This is intuitively plausible, yet the mechanism can be unpacked further. For follower economies, *the* key determinant of catch-up growth in the long run – that is, excluding short-run growth from capital accumulation – is the rate at which cutting-edge technologies can be absorbed, along with the initial stock of knowledge.[34] Technology absorption will be slower when its costs are higher, meaning that an economy seeking to enjoy catch-up convergence growth requires low costs of technology absorption. An open economy will have lower costs of imitation, because it will necessarily have a greater ability to capture new ideas developed in the rest of the world.[35] Provided that these costs of imitation are lower than the costs of innovation – which seems likely, given that innovation is never free – there will be a tendency for followers to converge on leaders.[36]

[31] On small domestic markets' role as a barrier to industrialisation, see (Murphy, Shleifer, & Vishny)
[32] (Winters, February 2004, pp. F5-F6) See also (Wolf, 2004, p. 41)
[33] (Winters, February 2004, p. F10)
[34] (Edwards, March 1998, p. 384)
[35] (Edwards, March 1998, p. 385)
[36] The importance of knowledge spillovers in driving the trade-convergence mechanism is well documented in (Feenstra, 2004, pp. 338-370)

Trade can also have additional indirect effects that cause convergence growth. A comprehensive review is beyond the scope or needs of my argument; however, trade may diminish corruption, reduce inflation, promote additional investment through economies of scale, foster better institutions (macroeconomic authorities and the rule-of-law), and can also exist in an endogenous relationship with education. All such effects – especially education, which builds human capital and facilitates technology absorption – tend to promote rapid catch-up growth.[37]

There also appears to be significant empirical support for these theoretical propositions. Sebastian Edwards finds the econometric relationship between trade and growth to be robust for nine different measures of openness.[38] Furthermore, Dollar and Kraay find that 'more globalized' emerging economies – defined as the most trade-liberalised third of their sample – experienced real per capita GDP growth of 5.2 percent between 1991 and 2000. This compares to only 2.2 percent in the developed world, and –1.1 percent in the 'less globalized' two-thirds of emerging economies.[39]

Convergence Driver 2: Financial Flows

International financial flows can take three forms: foreign direct investment (FDI), portfolio investment, and bank lending. The former often tends to be the most durable form of international investment, since the foreign parent organisation is directly involved in the control of an investment project, while the latter forms keep the investment project at 'arms' length' from the investor. Like trade, elevated cross-border financial flows are a defining feature of historical periods of international economic integration, including the present

[37] (Winters, February 2004, pp. F11-F16)
[38] (Edwards, March 1998, pp. 391-392)
[39] (Dollar & Kraay, June 2001)

one.[40] The potential convergence growth implications of each form of cross-border investment are discussed here in turn.

FDI is investment by firms based in one country in enterprises based in another country, with a view to acquiring a *controlling* stake; that is, setting-up a subsidiary. The parent and affiliate taken together constitute a multinational corporation (MNC). FDI by MNCs is what Stephen Brooks calls the 'globalization of production': it is not simply that one country's good are traded, but rather that the country's production itself spans across borders.[41] For convergence purposes, FDI can be conceived as a composite bundle of capital stock, knowledge and technology.[42] That said, there are distinct differences in the level of capital, knowledge, and technology transfer entailed by different types of FDI. Market-seeking FDI (where a foreign investor seeks exposure to a large emerging economy's potential domestic consumption base) and export-oriented/efficiency-seeking FDI (where an investor seeks to locate production in a foreign state that has a comparative advantage in export-directed manufacturing) both tend to involve more transfer than resource-seeking FDI (which tends to consist merely of the extraction of a state's natural resources).

The most obvious mechanism through which FDI produces economic convergence is by facilitating physical and financial capital accumulation, via high volumes of efficient investment.[43] Capital accumulation can lead to rapid catch-up growth by hitherto under-capitalised economies; the neoclassical result. Eventually, the marginal returns to capital will diminish and be outweighed by costs of accumulation, but this stage can be far away in developing economies (where a lack of efficient capital is often a key development problem).[44] Furthermore, if human capital expands in line with physical capital – an effect

[40] (O'Rourke & Williamson, 1999, pp. 207-246)
[41] (Brooks, 2005, p. 3)
[42] (Balasubramanyam, Salisu, & Sapsford, March 1999, p. 28)
[43] (Li & Liu, March 2005, p. 393)
[44] (Kolodko, 2003, p. 32)

that is itself partially endogenous on FDI – the point at which diminishing marginal returns are outweighed by costs will be pushed back.

As importantly, FDI generates technology and knowledge transfer from the advanced to developing worlds, which is likely to produce convergence, since it means that developed world capabilities necessarily transfer to follower economies faster than leading economies themselves improve.[45] By encouraging capital accumulation, FDI encourages the incorporation of new inputs and technologies in the production process.[46] In terms of inputs, convergence growth can result from the use of a wider range of domestically-produced intermediate goods in FDI-related manufacturing. In terms of technologies, FDI can be a source of productivity gains via spillovers to domestic producers, especially if the MNC actively facilitates the improvement of its domestic suppliers.

There can also be several other positive growth effects of FDI.[47] First, large FDI inflows tend to ensure a durable financial account surplus within the balance of payments, which can help to offset the possible macroeconomic problems of a current account deficit.[48] Second, FDI tends to boost exports, by setting-up assembly plants and helping host firms access international markets.[49] Third, the competitive pressures caused by an influx of MNCs – which are typically more efficient than local rivals – ensures competitive efficiency gains and incentives to adopt new, more productive technologies; this leads to a process of 'creative destruction.'[50] Fourth – and most fundamentally – convergence growth is heavily contingent on technology transfer to follower states, as stressed throughout. While there are many mechanisms through which this can occur, FDI is one of the most pronounced: MNCs

[45] (Li & Liu, March 2005, p. 393)
[46] (Li & Liu, March 2005, p. 394)
[47] (Zhang, April 2001, p. 177) See also (Balasubramanyam et al., March 1999, pp. 28-30)
[48] (Zhang, April 2001, p. 177)
[49] (Zhang, April 2001, p. 177)
[50] (Kolodko, 2003, p. 32)

do much R&D, and then share it with their subsidiaries (a contagion process).[51] Fifth, an additional effect is that FDI may 'crowd-in' domestic investment; local suppliers of component inputs are likely to be spurred to invest more, to meet incoming MNC demand.[52]

Like trade, the potential convergence effects of FDI are by no means guaranteed to occur. Furthermore, the relationship of FDI and national income growth is endogenous: foreign investors will rarely send their capital to an economy without demonstrable qualities, which often means growth potential (the frequent exception being resource-seeking FDI).[53] Nevertheless, FDI can certainly provide another mechanism that facilitates convergence during periods of international economic integration.

While FDI is a type of particularly remarkable capital flow, there are others of significance, notably private portfolio investment and bank lending. Unlike FDI, these other types of capital flow are not characterised by outright leading-economy ownership; the flow involves finance only, without any intention to obtain direct control. Such flows can take the form of share purchases, bond issues and other forms of indirect financial involvement (portfolio investment) or straightforward lending by banks and other fund managers, many of which are based in the advanced economies. Such financial flows are nothing new: European banks, in particular, have been lending to international ventures for centuries.[54] Yet they expand in periods of international economic integration, and complement the trade and FDI effects.

Since non-FDI financial flows do not involve as much transfer of advanced knowledge or technology (except for *within* the financial sector), one of the most important growth mechanisms identified above is limited.[55] However, such financial influxes *do* fulfil a

[51] (Borensztein, Gregorio, & Lee, June 1998, pp. 116-117)
[52] (Borensztein et al., June 1998, p. 117)
[53] (Li & Liu, March 2005)
[54] (O'Rourke & Williamson, 1999)
[55] On the importance of knowledge transfer to emerging market financial sectors, see (Lin, Yao, & Yueh, 2006, p. 273)

major growth role: the expansion of the capital stock. As stressed during the discussions of trade and FDI, capital is vital to growth: it permits the modernisation and expansion of industry, with subsequent productivity gains, especially if many agricultural workers make the transition to manufacturing or services. Expanded financial flows thus make convergence more possible, since a lack of capital is often a barrier to catch-up in developing economies.[56]

A related mechanism by which economic globalization of this sort may promote convergence is by the extension of a credible financial system to countries where it would otherwise be lacking. Domestic credit markets are typically amongst the weakest components of emerging economies, due to capital constraints, poorly-developed institutions, political interference, and so forth. By extending the developed world's financial system to emerging markets, therefore, a supply of capital for both investment and consumption 'smoothing' may be ensured: developing countries may have high saving rates, but often lack the financial institutions to convert this into investment capital. Of course, as the events of 2007-2009 demonstrated, unmitigated emerging market dependence on the Western financial system is by no means a universal blessing.[57] Nevertheless, in terms of overcoming frictional liquidity constraints and importing a functional system of credit markets, leading-economy financial transfer is likely a net positive.

Convergence Driver 3: Technology Diffusion

The role of technological diffusion has already been covered during the discussion of growth theory, trade, and financial flows. Technological progress – defined broadly to include knowledge and human capital – sits at the long-run heart of both neoclassical and endogenous growth models. In the context of developing economies, the transfer and diffusion of technologies from more to less advanced countries drives convergence: through a

[56] (Kolodko, 2003, pp. 31-32)
[57] (Patrie, Jeffery, Blagden, Pigat, & Mummery, 2009)

process of transfer and imitation, follower economies' per capita output can catch-up with the technological leaders.[58] Productivity convergence can be particularly rapid when technology diffusion facilitates the shift by agricultural labour into other, higher productivity sectors.

The reason for affording this mechanism its own section is that it is facilitated by certain other features of international economic integration, besides trade and financial flows. First, the increase of cross-border communication during integration periods facilitates technology diffusion: in the past, that has meant increased sea travel, cross-border telegraphy and other such innovations; more recently, it has meant the expansion of air travel and rise of fibre optic cables and the internet. In fact, these features have two catch-up effects: they improve developing countries' productivity in their own right, as well as ensuring that advanced economies' knowledge improvements are shared more rapidly around the world, facilitating broader technological diffusion.[59] Second, high mobility of labour in a more integrated world plays a vital role in knowledge diffusion.[60] Human migration tends to rise in periods of economic integration, which both increases the overall size of the destination state's labour force and facilitates international knowledge diffusion.[61] Moreover, the short-term movement of people also increases, which further facilitates the transfer of skills between states. Third, the cultural interchange facilitated by economic integration can have similar convergence growth effects: in integration periods, follower economies tend to be exposed to leading-economy capitalist practices and experience the incentives that this brings.[62] Furthermore, as the Soviet Union's demise demonstrated – and as North Korea continues to demonstrate – those that attempt to resist such practices struggle.

[58] (Barro & Sala-i-Martin, March 1997, p. 23)
[59] On the 'new' economy, see (Temple, Autumn 2002, p. 241) On the link between such forms of technological adoption and growth, see (Bassanini & Scarpetta, Autumn 2002)
[60] (O'Rourke & Williamson, 1999, pp. especially 33-35)
[61] (Crafts, March 2000, p. 29)
[62] (McGrew, 2005)

The reason that this convergence result implied by technological diffusion is more than coincidental is that follower economies necessarily carry a smaller relative share of the innovation burden. Leading economies have no-one to copy, but must instead expend time and resources on achieving technological progress. Follower economies, by contrast, avoid these problems: insofar as they are able to gain access to the advanced economies' knowledge, they can free ride on the benefits of others' efforts. Since imitation is typically cheaper, faster, and easier than innovation, therefore, such economies have the opportunity to converge on the established leaders.[63]

Of course, the observed persistence – and indeed, frequent deepening – of international income inequality demonstrates that the convergence result is certainly not guaranteed to occur, and technological lags can certainly persist for a considerable time even in the presence of an open world economy.[64] Indeed, this is why most scholars qualify their theoretical and empirical findings as representing conditional 'club' convergence, rather than absolute convergence.[65] There are also scholars who are sceptical of deriving *any* convergence conclusions from the economic integration theory offered here, given the importance of domestic policies and institutions to growth outcomes, and the potential for globalization to result in the exploitation of developing economies that do not respond to it effectively.[66] Furthermore, it is clear that convergence growth cannot continue indefinitely: eventually, if it catches-up far enough, a 'follower' becomes a 'leader,' and in turn starts to bear a larger share of the innovation burden itself. Indeed, the slowdown of convergence growth is likely to occur before a follower economy completely reaches the leaders' per

[63] (Barro & Sala-i-Martin, March 1997, p. 2)
[64] Of course, the fact that lags can persist for a long time does not disprove that technological diffusion is important to convergence growth. (Comin, Hobijn, & Rovito, December 2008)
[65] (Barro & Sala-i-Martin, March 1997) For a seminal early statement of this position, see also (Dowrick & Nguyen, December 1989)
[66] (Rodrik, 2007) For an overview of such thinking, see (Gruber, May 2011, pp. 633-636) Moreover, it is important to note that even in cases where economic openness facilitates growth, the proceeds of this growth may well be unevenly distributed domestically, resulting in rising inequality: (Gruber, May 2011, pp. 636-639)

capita income levels, as the 'low-hanging fruit' of technology diffusion become progressively exhausted and imitation costs start to rise.[67] Nevertheless, it is clear that international economic integration can at least open the way for technology and capital diffusion, and subsequent productivity convergence. This being the case, it is reasonable to conclude that catch-up of certain follower economies' national economic output levels towards those of leading economies is made more likely when there is a greater degree of international economic integration, even if other countries do not experience such convergence growth – and the fact that *some* states can experience catch-up is what matters for this dissertation's theory, rather than the debate over *which* states benefit, important though the latter is.

Economic Convergence, the Balance of Power, and the 'Integration Continuum'

As argued above, the principal source of state power is military capability, which rests in turn on a state's underlying industrial potential. Moreover, as demonstrated above, three economic processes – international trade, financial flows, and technology diffusion – facilitate the catch-up convergence of follower economies towards leading economies' per capita income levels. If the follower economies gaining from the convergence process happen to also have large populations, then the subsequent catching up of per capita income turns them into economic major powers. The implication of this is that trade, financial flows, and technology diffusion have the ability to alter the overall balance of international power, insofar as national material power is a function of on economic size and development levels.

From this finding, an even more important conclusion can be derived. Each of the three convergence processes – trade, financial flows, and technology transfer – is substantially expanded in periods of deepened international economic integration and globalization, as my case studies will demonstrate. This means, by extension, that

[67] (Barro & Sala-i-Martin, March 1997, p. 6)

international economic integration – which is defined by an expansion of these three processes – can drive a shift in the material balance of power between affected states. Moreover, when trade, financial flows and technology diffusion are expanded substantially by a deep integration process, this shift in the balance of power has potential to be both rapid and dramatic.

By contrast, in periods of low or minimal international economic integration, changes in the balance of economic power will happen more slowly, if at all. This is because, in the absence of the three convergence mechanisms, follower economies will bear their own capital and technological development burdens, which will make it much harder – or even impossible – for them to catch-up in per capita income terms. Accordingly, internationally 'non-integrated' economic periods must be taken as the point of comparison for my theory, with the move from low integration to higher integration functioning as the mechanism that unleashes convergence growth and thereby sets changes to the balance of power in motion.

What does this 'changed balance of power' mean in terms familiar to international relations (IR) theorists and national security strategists? The most salient point is that *international economic integration has the potential to create great powers*: if a large-but-undeveloped state becomes a large-and-(quite)-developed state through the convergence processes described, then it will acquire the latent industrial potential to become a major military actor. In IR terms, this creating of great powers amounts to a mechanism that moves the international system towards greater multipolarity.[68]

Moreover, the convergence mechanisms described can have an impact on the balance of power within a given great power interstate dyad. Amongst the major states at any given period, some will have higher or lower levels of per capita income, meaning that in the presence of convergence, there remains scope for one or more to rise or decline vis-à-vis the

[68] For a seminal treatment of the concept of international polarity, see (Waltz, 1979, pp. 129-131)

other(s). In short, international economic integration is capable of producing dynamic power differentials between the major states, which is a further important finding.[69]

Of course, international economic integration is a continuum, under which 'integrated' and 'not integrated' represent abstract ideal-types rather than likely actual states of the world. There has *always* been *some* cross-border economic exchange; it is simply the *degree* of integration that can differ significantly over time. Thinking in abstract terms, at one end of the spectrum, a *wholly* integrated economy would cease to be an independent sovereign entity from the economies that it was integrated with. Conversely, a *wholly* closed economy would scarcely be aware that there was a world beyond its borders. As a result, in talking about historically 'integrated' international economies in comparison to historically 'closed' international economies, my argument effectively creates a binary variable out of a continuous variable, and codes states of the world as 'closed' or 'integrated' despite the fact that neither real-world case may look exactly like the theoretical ideal-type.

Furthermore, integration inevitably displays a degree of ongoing deepening over time as a product of technological progress, even while integration can vary considerably within broad historical time periods. Consider the 1870-1914 period in comparison to the present day: both periods display considerable cross-border economic exchange, yet the advent of the internet and satellite communications in the latter has meant that the knowledge diffusion aspect of integration has probably deepened irreversibly. In other words, the point in the continuum at which the national economies are coded as 'integrated' or 'not integrated' probably shifts over time.

Fortunately, however, the theory does not require a timeless, 'perfect' conceptualisation of international economic integration, based on some immutable ideal-type. Rather, what is crucial for my argument is how the level of integration impacts the balance of

[69] (Copeland, 2000, pp. 15-20)

power at a given point in time. Accordingly, what really matters for my argument is how the degree of integration in period *B* changes relative to integration in the preceding period *A*. This is because, given a certain configuration of international power in period *A*, the balance of power in *B* may be either changed or held relatively stable, depending on whether or not convergence is engaged by a deepening of integration. As a result, the related problems of how to code integration and non-integration – both relative to each other and over time – can be dealt with by acknowledging that this is an inherently contextual variable, the impact of which must be studied solely via its relationship to the preceding historical period.

Turning Convergence Potential into National Power: State Rationality, Wealth Extraction, and the Puzzle of Domestic Policy Discretion

For the mechanism that my theory identifies to hold, it is assumed that at least some of the affected states are rational actors.[70] This does not mean that national decision-makers have to have a perfect and omniscient grasp of all possible future outcomes of all possible policy choices, which is clearly close to impossible. However, it does require that states pursue broadly sensible policies, think strategically about how to best serve their interests (amongst which national survival is assumed to be paramount), and eschew behaviour with the potential to damage their economic, political, or military standing.

Such an assumption has feed-through implications for various more specific aspects of my argument, and it is important to acknowledge that the result can be simplifications of reality in order to more parsimoniously model the international system. The first implication of any such rationality assumption is that states have the ability to transform economic wealth into national power. A number of potential problems with this view have already been touched on above, predominantly in the context of whether demographic trends or military-

[70] (Mearsheimer, 2001, p. 31)

technological lags exert influence on power independently of the national economic base. However, moving from latent wealth to realised power also necessitates the ability to mobilise that wealth for state purposes. In practice, this means that a political and bureaucratic system capable of harnessing national wealth for military means is required for a large economy to function as a major power.[71] The presence of such a system is a reasonable assumption for my theory to make, since most (though not all) large economies in history have proven politically capable of mobilising sufficient realised power from their latent economic potential to qualify as a major power, even if they have not always mobilised this power as efficiently as their competitors.

A corollary to the finding above is that large economies are assumed to have at least some surplus economic capacity that can be devoted to armaments, thus allowing economic size to be translated as at least some level of military power. Again, this is a reasonable assumption, since most rational political-administrative systems as discussed above are likely to have the capability to extract wealth for military means when vital national interests are in question, even if that means the population suffering some degree of greater privation. However, it is important to recognise that – as noted earlier – economies where per capita income is lower have to devote a larger share of total national economic output to the basic necessities of life, such as food.[72] This means that if two economies are of the same size in the aggregate sense, but one is more industrialised with a smaller population while the latter is less industrialised with a larger population, the former will have greater surplus national wealth to devote to armaments. Both states would therefore likely qualify as major powers, but the former may have the edge strategically; although this would in turn likely change as convergence ran its course. This caveat is particularly significant to the case of the Dutch

[71] For a seminal early statement of the relationship between industrial potential, national resolve and political/administrative capability in the capability-building of major military powers, see (Knorr, 1956) For a more recent (though still foundational) take on the role of political capability in mobilising industrial potential for military means, see (Organski & Kugler, 1980)
[72] (Mearsheimer, 2001, p. 62)

Republic – a small but highly developed country that achieved great power status – as will be discussed in Chapter V.

A second implication of this 'soft' rationality assumption is that states will pursue broadly sensible economic policies. Clearly, the economic mechanisms identified as synonymous with international economic integration – trade, financial flows, and technology transfer – only generate the *potential* for a state to enjoy convergence growth. If a state is to actually enjoy catch-up growth, it must respond effectively to integration opportunities with which it is presented. At the very least, this means opting into international economic exchange to some degree. A state that keeps itself closed off from trade, financial flows *and* technology diffusion – as states sometimes do for a number of domestic political or ideological reasons – is obviously not going to benefit from the convergence effects of these processes to anywhere near the same degree as those states that participate on a larger scale. The same can be said of a state that attempts to combine some limited international trade with autarkic and government-controlled efforts to develop the capital base and steal technologic innovations. This is not to say that the 'developmental state' model of maintaining high tariff rates while subsidising certain key domestic industries as they rise towards international competitiveness cannot be effective – clearly it can – but it is to say that catch-up growth will be substantially less likely in the absence of *all* forms of integration.[73]

Beyond this involvement in the international economy, economic policy must also meet at least a certain threshold of competence. A state that participates in the global economy but that also engages in profligate fiscal policy, pursues expansionary monetary policy that fuels inflation, develops unsustainable current account imbalances, attempts to

[73] The 'Asian Tigers' (South Korea, Taiwan, Singapore, and Hong Kong), for example – four success stories of the developmental state model – all focussed on expanding exports, absorbing the best of Western technology and attracting capital inflows (much of it Cold War-related Western aid), even as they also sought to discourage domestic consumption and boost high-value industrial development via high import tariff rates and extensive state subsidisation. As such, their spectacular economic rise certainly required domestic effort, but it was also made possible by aspects of the international economic integration process described here. (Gilpin, 2001, pp. 316-328)

maintain an overvalued exchange rate peg without the foreign exchange reserves to support it, or becomes excessively financially leveraged is unlikely to be a convergence success story over the long term. It is such considerations that force most economic convergence theorists to qualify their models as explaining and predicting *conditional* convergence – that is, with various economic policy considerations held equal – rather than *absolute* convergence.[74] Again, that major states' economic policies will be reasonably effective (or at least not self-defeating) is a reasonable assumption to make for at least a majority of cases. Yet it is important to note that there are important exceptions to the assumption, and some of these have had a major impact on the evolution of the balance of power. Consider the 'irrationality' (and corresponding demise) of the Soviet economic model, or the competitive inefficiencies of British and French imperial production systems in the face of the market-based (and subsequently more dynamic) early twentieth century US and German economies.

Crucially for the theory, however, while leading economies can *exacerbate* their decline through *inefficient* economic policies, they cannot *avoid* it through *efficient* economic policy, provided that the follower economies are not themselves pursuing ineffective policies. In other words, provided that a follower economy meets the challenge of pursuing good economic policy, the convergence mechanisms are free to proceed apace regardless of how effective leading states' own economic policies are.[75] This is the reason that international economic integration *itself* functions as the pivotal independent variable in my theory, rather than national economic policy. Moreover, a further source of support for my assumption that major states are likely to pursue broadly rational economic policy most of the time comes

[74] See, for example, (Barro & Sala-i-Martin, March 1997)

[75] The obvious caveat to this statement is that *intentional* policy efforts by leading economies to retard follower economies' rise – such as economic containment or even preventive war – could slow or prevent the ascendant states' convergence. My point, however, is that – within the normal parameters of economic policy – convergence is there for the taking by follower economies in the presence of international economic integration. Moreover, the finding that containment or war may be options pursued by leading powers to prevent the rise of follower powers bolsters rather than undermining my theory, since this illustrates the precise *source* of the conflict incentives generated by the integration-convergence process, as will be discussed below.

from the potential for states to learn and adapt their economic models in response to the competitive pressures of the international system.[76] Rational strategic policymakers looking at historical evidence of economic efficacy are likely to reform and tailor their national economic models in a way that generates less risk of self-defeating behaviour. Referring back to the examples cited above, neither pan-continental imperial economies nor Soviet-style controlled economies are now included amongst the ranks of major powers, suggesting that such economic models have been competed out of the international system. Moreover, one pivotal rising power that *used* to have a Soviet-style autarkic economy – the 'People's Republic' of China – is now communist in name only.

[76] (Waltz, 1979, pp. 127-128)

III. Consolidating Realist Theories of Conflict

The purpose of the chapter above was to outline how economic integration can drive a shift in the material balance of power between major states. The purpose of *this* chapter is to elucidate mechanisms through which this shift in the balance of power can generate interstate conflict incentives. The following chapter will in turn pull these two steps together into an integration-convergence theory of major power conflict, positioning the argument vis-à-vis existing literature and bounding its reach via scope conditions in the process.

Here, therefore, I seek to lay-out a theoretical framework that connects the conflict propensity of the international system to the balance of material power between major states; an exercise that should serve to illustrate the importance of *changes* in that balance in explaining moves towards war. In academic terms, this means utilising two strands of structural (or 'neo-') realist theory, since neorealists see variation in power configurations as the principal determinant of systemic war-proneness – although, as stressed previously, my hope is that my theory will also have intuitive plausibility and appeal both to those outside the realist fold and, indeed, beyond the academic IR community.[1] Structural realism takes as its starting point the assumption that the international system is anarchical; unlike domestic politics, the international environment lacks a common, sovereign enforcement authority. In such a world, states are continually at risk from the military power of other states, necessitating that they, in turn, acquire military forces capable of protecting and advancing their vital interests – and since all states reason in the same way, strategic competition is a continual risk. The first strand of such structural realist thinking – polarity theory – explains the likelihood of major war in terms of the number of great powers ('poles') in the international system. The second strand of such thinking – dynamic differentials theory –

[1] For the canonical text in the neorealist theoretical school, see (Waltz, 1979)

explains the outbreak of major war in terms of how the power position of major states is changing vis-à-vis other major states.

It is far beyond the scope of this dissertation to seek to adjudicate all outstanding debates and disagreements in IR theory. Nevertheless, it is worth saying something about my choice of structural realism as the underpinning framework for the theory. On a fundamental level, the first stage of the mechanism that I am seeking to describe is not uniquely 'realist,' in the sense that scholars of all theoretical perspectives might concede that the integration-driven power shift that I describe could generate conflict *incentives*. However, constructivists would likely argue that the possibility of transcending the 'self/other' divide offers the prospect of escaping a Hobbesian culture of anarchy, thereby consolidating peaceful coexistence.[2] Likewise, liberal theorists see three principal mechanisms – international institutions, democratic peace, and economic interdependence – that offer the prospect of strengthening international cooperation.[3] In short, the disagreement arises at the next stage of theory, namely, over the likelihood of conflict *incentives* generating actual *conflict*. As such, this argument should not be taken as an inter-paradigmatic attempt to prove that non-realist theories are 'wrong;' rather, it simply seeks to answer an interesting question about world politics using a suitable set of theoretical tools. That said, of course, as will be discussed later, the dissertation does suggest that there is a countervailing mechanism operating against the economic interdependence pillar of liberal theory.

[2] For a seminal early statement on the likelihood of states coming to see themselves as part of a communal international *society* – and therefore one of the first suggestions of the possibility of transcending the 'self/other' distinction – see (Bull, 1977) For the social constructivist position in IR theory, including a detailed focus on the possibility of mitigating anarchy by moving away from intense security competition towards more familial interstate relations, see (Wendt, 1999, Spring 1992)

[3] On neoliberal institutionalism, see (Axelrod & Keohane, October 1985; Keohane, 1984) On democratic peace theory, see (Lipson, 2003; Russett, 1996) For one major statement of the economic interdependence position, see (Rosecrance, 1986) For an important contemporary recasting of the latter position (with a focus on foreign direct investment rather than cross-border trade) – a recasting that my theory talks to directly, and that I will therefore return to later – see (Brooks, 2005)

Polarity Theory: Numerous Powers, Numerous Wars

The single most influential theory of major war derives its predictions for the peacefulness or otherwise of the international system from the number of great powers – poles – in that system.[4] Indeed, this theory has dominated realist discourses on the causes of war, particularly since the 1979 publication of Kenneth Waltz's *Theory of International Politics*, although the broad manner of thinking about international structure as multiple powers competing under anarchy – sometimes violently – long predates the emergence of contemporary neorealist scholarship.[5] Moreover, the pivotal importance of polarity theories of conflict is acknowledged even by scholars critical of the position, with an appreciation of Waltz's work serving as a point of departure for many of the most powerful constructivist and liberal IR theories.[6]

As stated above, the principal starting assumption of realist theory is that, under conditions of anarchy, states that wish to survive must pay attention to the balance of military power, with violent force serving as the *ultima ratio* of world politics. Scholars from the defensive and offensive realist schools diverge about how much power is enough to satisfy states, but all variants of the broad theory recognise that adverse shifts in the balance can contain the seeds of conflict.[7]

The analytical basis of structural realism rests on a number of assumptions, and while there are variations between differing strands of the neorealist school, John Mearsheimer's

[4] For a critical appraisal of neorealism's influence, see (Vasquez, 1998)
[5] For a direct application of polarity theory to the causes of war, see (Waltz, Spring 1988) For a broader statement of international structure and stability as a product of polarity under anarchy, see (Waltz, 1979, pp. 129-131, 161-163) For earlier castings of the realist positions that identify the importance of anarchy as an ordering principle and source of conflict (although these classical realists also attach much more importance to state leaders' aggressive intentions than do their neorealist successors), see (Carr, 1964; Morgenthau, 1973)
[6] See, for example, (Wendt, 1999, p. 2)
[7] For Waltz, 'a high regard for preserving a *balance* [of power] is at the heart of wise statesmanship' – that is, there is some satisfactory level of power that can be attained, with this level determined as a relational balance vis-à-vis a state's rivals (although note that Waltz stops short of deriving foreign policy prescriptions from his theory, hence he posits this statement as a hypothetical) – while for Mearsheimer, 'The pursuit of power only stops when *hegemony* is achieved' (emphasis added in both cases). (Mearsheimer, 2001, p. 34; Waltz, 1979, p. 120)

2001 framing of these assumptions is perhaps the most explicit to date.[8] First, as stressed throughout, the international system is *anarchic*, which does not mean that it is necessarily riven with disorder and chaos, but rather means simply that the system is not hierarchical and possesses no overarching enforcement authority.[9] Second, all great powers possess some degree of *offensive military capability*, even if they make explicit attempts to rid themselves of such capability. Third, as described earlier in this section, states can never be certain about other states' *intentions* – whether they are merely interested in preserving the international status quo, or rather are potentially aggressive revisionists – especially given the potential for another state's preferences to shift in the future. Fourth, *survival* is the highest goal of all states; while countries can have a multiplicity of interests and policy goals, these will be unachievable if the state itself is wiped-out. Finally, great powers are *rational* actors that think strategically about how to best further their vital interests. Such an assumption does not require all states to continuously display diabolical omniscience, but it does suggest that many major states will pursue broadly sensible policies given their current and likely future circumstances, especially in situations where their survival is immediately at stake.[10]

Following from these five assumptions, Mearsheimer generates three conclusions about state behaviour.[11] First, prudent states *fear* each other, since they cannot be sure that

[8] (Mearsheimer, 2001, pp. 30-31)
[9] For challenges to the view that domestic and international politics can be neatly delineated as hierarchical and anarchical, respectively, see (Milner, January 1991; Wagner, 2007)
[10] Recently, Mearsheimer has suggested that – given the wide array of reckless policies that states evidently pursue in the real world – realism may be better conceptualised as a normative theory of how states *ought* to act, rather than as a positive theory of how they *do* act: (Mearsheimer, June 2009) On this potential for states to 'self-weaken,' see (Hui, 2005, pp. 50-52) Elements of this thinking are also evident in one of the most important recent works of nuanced realist scholarship: (Glaser, 2010) However, this micro-level finding on what constitutes prudent foreign policy does not necessarily discredit structural realist approaches as broader macro-level explanatory theories: in a competitive international system where states can bolster their own prospects of survival by taking military action against others, states that persist with recklessness over a long period of time are likely to eventually face a stark choice between incorporating sensible balance of power concerns into their foreign policy calculus, or ceasing to exist (at least as a great power capable of advancing their own vital interests, if not altogether as sovereign entities). Critically for my argument, all that matters is that shifts in the balance of power *can* generate conflict incentives between *some* major states, even if other irrational or 'reckless' states disregard such shifts as unimportant.
[11] (Mearsheimer, 2001, pp. 32-40) For the challenge that Mearsheimer, and structural realists more generally, do not infer valid arguments for the likelihood of conflict from their theoretical premises, see (Wagner, 2007, pp.

their neighbours have benign intentions, they do know that their neighbours have some offensive military capability, and they also know that there is no 'world police' to call if they are attacked.[12] Accordingly, the mere possibility of conflict is sufficient to extensively condition states' behaviour.[13] Second, the international system is *self-help*; states make efforts to furnish themselves with the means to protect themselves, given a combination of fear and the lack of guaranteed external assistance. Finally, and as a result of these two other forms of behaviour, states try to *maximise their share of world power* – via calculated aggression if necessary – since the only way to be entirely safe from attack is to be a global hegemon (which is practically impossible), and getting as much power as possible in the quest to become a regional hegemon is a next-best solution.[14] To be sure, as noted, offensive and defensive realists disagree on this latter point, with defensive realists reasoning that a certain level of power – one that preserves a rough balance between rivals – is sufficient to satisfy states, while offensive realists believe that – given fear of other states' future intentions – more power is always better, and this disagreement is a potentially fertile area for future scholarly investigation. Crucially, however, the argument about the destabilising potential of power shifts points in the same direction for both defensive realism (Waltz, Charles Glaser) and offensive realism (Mearsheimer, Keir Lieber), so this is not a major issue for the overall theory.

Given this analytical basis, what role does polarity play in structural realist explanations of systemic war-proneness? Sophisticated arguments can certainly been made that multipolarity – an international system of three or more great powers – is more stable

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13-36) For a rejoinder, see (Schweller, 2010) For a similar critique of realist theory's deductive aspirations – although not a terminal challenge to its overall value, given its heuristic utility – see (Humphreys, June 2011)

[12] Mearsheimer characterises this latter feature as the '911 problem', although '999' would be its UK equivalent.

[13] (Brooks, Summer 1997, pp. 447-450)

[14] Recent quantitative research has questioned Mearsheimer's empirical conclusion that states are continually looking out for opportunities to increase their power through aggression: (Valeriano, April 2009) However, such challenges do not undermine the causal logic of Mearsheimer's theory, and even offensive realists that states will be cautious about launching war, given the risks involved; hence the comparative scarcity of visible aggression. On such 'opportunism' over prospects for successful aggression, see (Lieber, 2005, pp. 155-158)

under certain conditions (with 'stability' here meaning the continuing absence of major interstate conflict) than bipolarity, a system of only two great powers.[15] However, both defensive and offensive realists in the contemporary era have tended to agree that bipolarity is the most stable, and therefore war-free, form of international system.[16] Indeed, even Hans Morgenthau – who is often seen as advocating an international system full of numerous powerful allies – is still predominantly talking about the dynamics between bipolar alliance *blocs*.[17] Moreover, while the possibility of genuine unipolarity – a situation of only a single great power, such as the contemporary era of US dominance is often said to represent – is a subject for debate, those who believe that it can occur (and presently *is* occurring) have tended to argue that it is broadly peaceful.[18] The obvious corollary to these positions is that multipolarity is viewed as a more war-prone international system.

Multipolar international systems are seen as much more conflict-prone in structural realist theory for three principal reasons.[19] First, and most basically, *the number of potential great power conflict dyads rises exponentially as polarity increases*: unipolar systems have none, bipolar systems have only one, three-power multipolarity has three, four-power multipolarity has six, and so on. Second, there is *less likelihood of power inequality in bipolar systems* – since each power will attempt to match the other directly – presenting fewer opportunities for one great power to conquer another.[20] Third, *bipolar systems contain less uncertainty*, and subsequently far less potential for conflict-producing miscalculation: each pole is aware of its core security threat, and also aware that it can only rely on its own

[15] (Deutsch & Singer, April 1964)
[16] (Mearsheimer, 2001, p. 45; Waltz, 1979, pp. 161-163, 170-176)
[17] (Morgenthau, 1973, p. 181)
[18] For the canonical statement of this view, see (Wohlforth, Summer 1999) That said, this view has recently been challenged on the grounds that unipolarity can be more war-prone than bipolarity or even multipolarity, at least at the minor power level: (Monteiro, Winter 2011-2012) These positions are not wholly incompatible, however, because Wohlforth is focusing on the great power dyadic level while Monteiro is focusing on dyads involving at least one minor power.
[19] For a neat summary of these arguments, see (Mearsheimer, 2006, p. 79)
[20] Although, of course, when there *is* power inequality, it is potentially more destabilising, meaning that the implications of this particular point are not clear-cut.

internal balancing resources (in the absence of a potential great power alliance partner, there is no opportunity to engage in external balancing, otherwise known as passing the buck).[21] In short, bipolar systems offer the best prospect of mitigating incentives to harm rival(s) generated by the security dilemma, while multipolar systems are more likely to let such incentives towards aggression run unchecked. This core logic is illustrated diagrammatically in figure 1.

Additional dangers arise if the multipolar system in existence becomes *unbalanced*. In such a situation, there are several great powers in a region, but one has the potential capability to become a regional hegemon while the others do not. This state will then have major incentives to safeguard its future security by making a run for regional hegemony – that is, improving its relative position by weakening potential regional peers – which removes all other great power threats. Such an incentive towards calculated aggression at the expense of neighbouring states is therefore especially likely to foster major power conflict, not least because other major powers in the region will recognise the potential hegemon's incentive structure, and thereby have their own incentives to balance against it, generating an acute security dilemma.[22] As such, while balanced multipolarity – perhaps a scenario of three roughly equal powers – can also be very stable (no one of the three would see itself as having a good chance of overrunning the other two, say), unbalanced multipolarity leaves ample scope for one particular state to attempt to aggressively 'run the tables.'[23]

So, how does this understanding of polarity-based theories of conflict incentives and systemic war-proneness relate back to the earlier discussion of economic integration-driven power shifts and my broader argument that economic integration can cause war? The key mechanism through which the two interact is that economic integration can cause the relative

[21] Indeed, this latter point is identified as the principal cause of major power war in Waltz's seminal account: see (Waltz, 1979, pp. 170-176) See also, (Mearsheimer, 2001, p. 272)
[22] (Mearsheimer, 2001, pp. 44-45)
[23] On the potential stability of *balanced* multipolar systems, see (Copeland, 2000, p. 16)

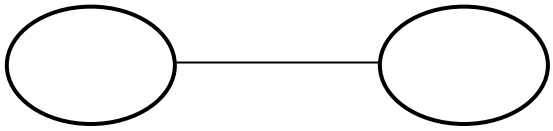
rise of follower states, and by doing this, as argued above, it can create great powers. In other words, economic integration is an underlying causal mechanism that can shift the system's polarity. Insofar as a move towards multipolarity makes the international system more war-prone, there can therefore be a direct causal link between international economic integration and international systemic war-proneness, via the national wealth convergence mechanism outlined previously. Moreover, given the dynamism inherent in the economic catch-up process, there seems ample scope for the multipolarity that emerges to be unbalanced: a worst-case scenario for systemic war-proneness.

Of course, it is quite possible for a more limited economic integration-driven power shift to occur without any outright polarity shift taking place. Moreover, there are at least theoretical scenarios – for example, if unipolarity is less peaceful than bipolarity[24] – whereby the creation of a new great power as a result of economic integration could make the international system more stable, rather than less. And equally, if economic integration brings about the relative rise of one great power at the expense of another, polarity could of course remain fixed or even decrease: say, if one state became a great power but two ceased to be great powers at the same time. Crucially, however, an increase in polarity remains the most plausible outcome of a period of integration-driven differential economic dynamism. The theory does not predict that declining powers will suffer a sudden economic catastrophe or terminal collapse; merely that they will suffer sustained weak growth relative to rising powers. As such, it does not predict that they will suddenly fall from the ranks of great powers; merely that that their relative standing will erode as follower economies rise and acquire the wealth necessary to also become great powers, hence polarity would go up. Furthermore, insofar as the catch-up growth fostered by international economic integration is fundamentally a process of large-scale diffusion, it is likely that – addressing the first two

[24] (Monteiro, Winter 2011-2012)

sentences in this paragraph – it will (a) empower more than one country, and (b) result in a sufficiently large shift in national wealth as to constitute a change in polarity.[25]

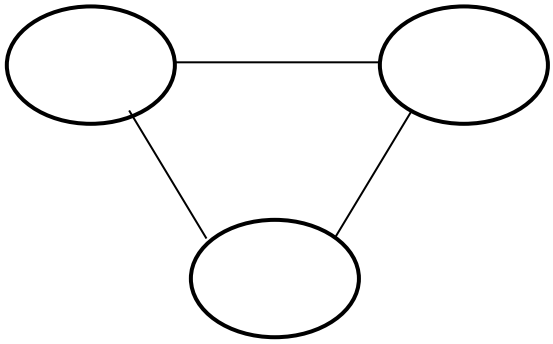
Figure 1(a). Bipolarity



1 Great Power Dyad:

No opportunity to buck-pass; powers balance equally

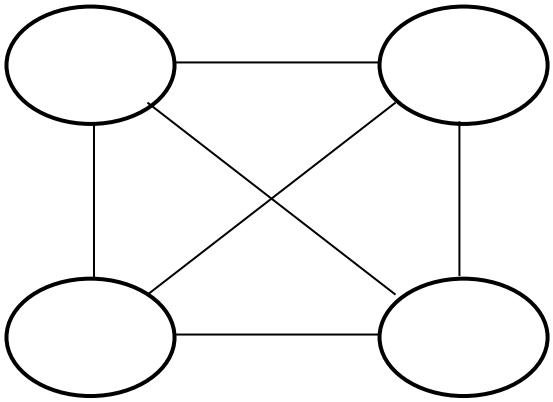
Figure 1(b). Three-Power Multipolarity



3 Great Power Dyads:

Opportunity to buck-pass introduced; chance of significant power inequality

Figure 1(c). Four-Power Multipolarity



6 Great Power Dyads:

All rational states attempt to buck-pass; strong probability of significant power inequality

Five-power multipolarity has 10 great power dyads, and so on. Thus, the buck-passing and power inequality problems become more acute as polarity increases.

[25] Note, however, that as my case study analysis will show, the early period of the Netherlands' rise is a partial exception to point (a), although the catch-up process later extended to Britain also (so this is more supportive of (a)), while the Cold War experience of significant dynamic differentials unaccompanied by a noticeable polarity shift is an exception to point (b).

Likewise, in a hypothetical situation where the most developed economy in the international system was also the largest in terms of population, there would be a limit to how far followers' overall GDP could catch-up: even if their GDP per capita was the same, they would still be smaller in aggregate terms, meaning that a polarity increase might not take place. And conversely, in a hypothetical situation where the most developed economy was much smaller in population terms than the follower economies, the latter may already have a larger GDP than the former (China and Taiwan is a contemporary example), meaning that per capita catch-up would simply widen their aggregate lead, again suggesting that there would be no polarity shift. The universe of possibilities is detailed in figure 2. Yet both of these hypotheticals refers to a very specific set of conditions, and as my empirical cases will demonstrate,[26] the principal periods of deepening economic integration of the modern (approximately post-1500) Euro-Atlantic international system have not been characterised by either of these non-power-shifting scenarios.[27] Future scholarship could therefore investigate whether there is something necessary about the fact that economic integration seems to deliver catch-up growth to states with the size potential to become great powers.

Dynamic Differentials Theory: Power Transitions and Conflict Incentives

Another variant of structural realist theory that possesses explanatory strength and is relevant to my argument focuses on the conflict incentives generated by the differential rates of change in countries' relative power. While contemporary scholarship in this vein has

[26] Since the dissertation relies on small-*n* case study analysis, as the best way to investigate the causation of rare-but-important events, it is not possible to say whether either of these hypothetical scenarios has *ever* characterised a period of deepening international economic integration beyond the Euro-Atlantic international system, in the pre-1500 world, or indeed a smaller-scale case of deepening integration in the post-1500 Euro-Atlantic world. Indeed, an attempt to definitively address this question at the global, pan-historical level would require a comprehensive review of *all* international economic exchange between *all* regional powers throughout both the modern and the pre-modern eras, which is clearly infeasible.

[27] The partial exception – as Chapter VII makes clear – was the Cold War experience of the non-US G5 states (Japan, West Germany, France, and the United Kingdom), which experienced catch-up growth towards US development levels but lacked the population prerequisites to become US peer great powers. This exception is only partial, however, as the population of another follower economy that experienced catch-up growth – the Soviet Union – was larger than that of the United States.

adopted the moniker 'dynamic differentials' theory, this is but the latest and most sophisticated refinement of power transition theory; a rich scholarly tradition that connects major war causation to the relative rise and decline of the system's principal states.[28] Indeed, Michelle Benson asserts that 'Over the last five decades, power transition theory has proven itself to be the most successful structural theory of international war.'[29] Such an enthusiastic endorsement illustrates that, while polarity theory of the Waltz/Mearsheimer variants has probably done the most to define the academic study of contemporary neorealism (and its principal critics) since 1979, power transition theories still generate an extensive scholarly following on the basis of both their analytical and empirical strengths.

Dynamic differentials theory shares many similarities with polarity theory in terms of starting assumptions. The key international ordering principle for many such scholars (though not all) – and the factor that opens the way for interstate conflict – is again anarchy.[30] States have survival as their highest goal, all states possess a degree of offensive military capability (or at least have the latent potential to do so), and all states are seen as being rational. Crucially, the problem of uncertainty over the peacefulness of other states' intentions – particularly going forward into the future – is also an endemic feature of the international system.[31]

Given these starting assumptions, dynamic differentials theory goes on to postulate that major war is likely to occur when a great power realises that it is experiencing a decline

[28] The argument that dynamic differentials theory is a further refinement of power transition theory is contested by scholars in both camps. I will outline my reasons for grouping them together below; however, it is worth noting that resolving this debate is relatively unimportant for my causal story.
[29] (Benson, July 2007, p. 211)
[30] Note that for many leading power transition theorists (perhaps most notably Robert Gilpin), the international system is characterised by *hierarchy* rather than anarchy, since conflict results when the world's leading power (the hegemon) is displaced by an ascendant rival. However, since such theories neglect the strength of the anarchy assumption (even the most powerful state in the system can hardly be said to represent an overarching sovereign enforcement authority), and have little to say about multipolarity – both key weaknesses for such scholarship – I am focussing here on the contemporary variant of dynamic differentials theory promulgated by Dale Copeland; a variant that *does* see anarchy as a defining and immutable characteristic of the international system: (Copeland, 2000, p. 12)
[31] (Copeland, 2000, pp. 28-30)

in its power relative to an ascendant rival. The causal logic here is that, given the conditions of fear for survival and uncertainty over other states' future intentions, a declining state realises that it will become increasingly vulnerable to coercion or even conquest by its ascendant rival as time passes.[32] This being the case, it has a potent incentive to use its power to retard the rise of potential competitors while it is still able to, via military force if necessary.[33] Thus, for dynamic differentials theorists, the seeds of conflict lie not so much in the overall number of great powers, but rather, in how the powers' standing is changing relative to one another.

Further explanatory power is added to dynamic differentials theory by its ability to deal with qualitative differences in the scale and severity of different states' rise and decline. Specifically, the likelihood of major war breaking out is expected to increase when the decline of one or more of the system's great powers is seen as both deep and inevitable; a proposition that makes intuitive sense.[34] In cases where a declining state expects to fall very far, it will be especially vulnerable to its ascendant rival in future.[35] Likewise, when decline is seen as unavoidable as a result of broader economic structural forces, preventive military action will be a more tempting option than when internal economic policy reforms offer the prospect to reverse the backsliding for relatively little cost. Finally, war is especially likely when a state finds itself with superior military power but waning economic power – a common scenario, given that changes in military wherewithal tend to lag changes in

[32] (Copeland, 2000, p. 4)
[33] There would be no incentive to retard the rising power, of course, if it could commit not to threaten the declining power in future once the latter has weakened, but such commitments cannot be credibly enforced in the absence of a higher authority: (Fearon, Summer 1995, p. 381)
[34] (Copeland, 2000, p. 20)
[35] Conversely, of course, if decline is both mild and slow, peaceful major power relations may be easier to sustain, particularly if a defence-favourable offence-defence balance can be maintained. After all, if a state is declining over a 1000-year time-horizon, it would require a very low discount rate indeed to be applied to the future – and extreme pessimism about the prospects for avoiding conflict in the future – for it to make sense to incur the costs of war in the present. On the importance of discount rates in trading off present benefits against future dangers in states' foreign policy, see (Powell, March 1993)

underlying industrial might – since the declining state will realise that it has great ability to retard the rise of a competitor but that this ability will evaporate over time.

Contemporary dynamic differentials theory of the strand utilised by Dale Copeland makes a significant break with previous variants of power transition theory, insofar as the incentives towards aggression are attributed to the *declining* state. For a number of influential power transition theorists, the *rising* state is the one with the aggression incentives, since as its power increases, it will increasingly seek to reorder the international status quo in a way that better serves its interests.[36] Copeland takes issue with this view, on the grounds that a rising state becomes stronger with each increment of passing time, meaning that the longer it refrains from violence, the better its strategic position becomes; by contrast, the deck is stacked in the opposite direction for a declining state.[37] However, when the dyadic nature of international relationships is considered, this debate is relatively unimportant, since the conflict incentives of each side figure in the conflict incentives of the other. Put simply, if the rising state has incentives to reorder the international system – possibly through force of arms – once its ascent is complete, then the declining state has even stronger incentives to choke-off its rival's rise through military action. Conversely, if the rising state recognises that the declining state has incentives to thwart its rise, then the rising state's incentive is to weaken or defeat the declining state as soon as possible, since it may make sense to move first rather than running the risk of waiting. In short, the key implication – and the one that matters for my causal story – is that the *dyadic* process of relative rise and decline may exacerbate the security dilemma and give *both* sides powerful conflict incentives.

How does this understanding of dynamic differentials theory feed back into my economic argument and broader theory? Quite simply, since economic integration can cause follower economies to catch-up with leaders in aggregate national wealth, this is akin to

[36] (Gilpin, 1981, Spring 1988; Organski & Kugler, 1980)
[37] (Copeland, 2000, p. 13)

saying that economic integration drives the dynamic power differentials that are identified as the cause of war in this variant of structural realist theory. Indeed, an accommodation of the conflict incentives generated by dynamic power shifts is one of the key strengths of power transition theories (the static nature of polarity-based theories of war has long been a key criticism levelled at structural realism).[38] If economic integration can drive differential changes in relative power and differential changes in relative power generate incentives for the world's major states to fight each other, this means that economic integration can generate incentives for the world's major states to fight each other: an important finding for our understanding of the causes of war. Moreover, this mechanism is highly applicable to my theory, as there will always be dynamic shifts in the relative standing of different powers whenever the economic integration process drives differential growth in national wealth.

Of course, if the integration process has only a limited impact on relative national wealth, then this dynamic differential power change may only be mild. Yet given that economic integration periods often involve profound shifts in the global distribution of wealth, there is certainly scope for the dynamic differentials generated to result in a large relative power shift. Given that the states that find themselves undergoing relative economic decline are also likely to initially be the ones with the most capable military forces – a legacy of their former economic dominance that will in turn wane on the back of their industrial power – the conflict incentives generated by these relative power shifts have the potential to be acute.

Integrating Realist Perspectives on Power Change

Both the polarity and dynamic differentials variants of structural realism suggest mechanisms through which economic integration-driven shifts in the balance of power can

[38]For a criticism of structural realism's failure to deal with dynamic power shifts, see (Dunne & Schmidt, 2005, p. 177) For a defence of power transition theory on the grounds that it fills this 'dynamic deficit,' see (Copeland, 2000, p. 13)

cause the international system to become more war-prone. As such, while these theories do not have sufficient deterministic power to say that certain international systemic conditions – namely, the occurrence of deepening economic integration between major states – will *definitely cause* great power war, they do make a compelling analytical case that such systemic conditions will make great power conflict *more likely*. For polarity theorists, international economic integration can create new great powers, thereby moving the international system towards potentially-unbalanced multipolarity, a global power configuration that generates significant conflict incentives. For dynamic differentials theorists, by contrast, international economic integration can cause the existing major states to experience either a rapid decline or a rapid improvement in their power position vis-à-vis potential rival states, which in turn generates an intense security dilemma and incentives towards aggression.

Insofar as both variants of structural realism are compatible with my theoretical argument, my mechanism is left functional even if one of the two variants is rejected. In that sense, I do not *need* to fuse the two theories into an integrated whole in order for my causal logic to hold. Nevertheless, both polarity-based and dynamic-differentials-based variants of realism offer important insights into aspects of war causation, and can be integrated fruitfully in order to advance our understanding of international conflict.

Polarity theory is an effective 'static' predictor of overall systemic conflict-proneness. As an essentially 'freeze-frame' snapshot description of the world at a given point of time, it provides a useful guide as to how likely the international system is to fall into conflict. Moreover, insofar as economic integration can shift polarity, this gives us an important guide as to how economic integration can alter the international system's propensity to degenerate into major power warfare. In particular, the analytical basis for why multipolarity is less stable than bipolarity – based on the increased number of potential conflict dyads, the greater

chance of power inequality, and the greater uncertainty involved when there is a chance to pass the balancing buck to other powers – is intuitively plausible. Moreover, both the empirical and theoretical case for unbalanced multipolarity being especially war-prone is persuasive. As such, while 'exactly balanced' multipolarity could conceivably be as stable as – or even more so than – bipolarity, the fact that it is likely to be unbalanced to at least some degree in practice means that the general conclusion that multipolarity is more conflict-prone than bipolarity is probably reasonable, and Mearsheimer's empirical evidence bears this conclusion out.[39]

However, despite the overall explanatory strengths of polarity-based theories of conflict, they are still lacking a degree of predictive power. Specifically, while a multipolar system may be more conflict-prone as a matter of probability, it is still not clear what the dynamic process would be that would cause such a system to tip from peace to war at a given time. For this, the ability of dynamic differentials theory to account for dynamic changes in relative standing fills an important explanatory gap. Put simply, while unbalanced multipolarity may be the most war-prone overall systemic power configuration, the acute security dilemma generated by dynamic differentials – namely, between power(s) experiencing relative decline and other power(s) ascending towards the situation where they may have the latent potential to make a run at regional hegemony – likely produces the conflict incentives on both sides. Moreover, as Copeland's empirics illustrate, war or other militarised crises can still occur under balanced multipolarity or even bipolarity – even if they are less likely – which suggests a need to retain a dyadic causal variable in explaining the escalation to war. Dynamic differentials can play this role, since relative power shifts can be destabilising on this logic irrespective of polarity.[40] Insofar as these differential power changes can take place under any given polarity framework, therefore, they may have an

[39] (Mearsheimer, 2001, pp. 168-359)
[40] (Copeland, 2000, pp. 56-234)

important causal role as the key exacerbator of all parties' incentives towards interstate aggression.

Fusing the two theories in this manner does entail a rejection of the findings on polarity of Dale Copeland, the principal contemporary dynamic differentials theorist. Copeland argues that balanced multipolarity is more stable than bipolarity, since a declining great power in bipolarity realises that it only has one other power to knock-out in its bid to shore-up its waning position, whereas under multipolarity, the declining power will have a less high opinion of its ability to 'run the tables' against all other powers in the system.[41] Yet this perspective entails a great degree of faith in the ability of the major states under multipolarity to engage in coordinated balancing; faith that would not necessarily stand up under pressure, given the incentives for all threatened powers to attempt to pass the buck to others in a bid to avoid bearing the severe costs of deterrence or war themselves. Moreover, the balanced multipolarity of the kind conceptualised by Copeland is not necessarily likely to occur in practice. Some degree of imbalance is much more likely, and in such a situation, the potential regional hegemon – that is, the one with the incentives to make a run for regional dominance through aggression – is not necessarily more likely to be deterred by a collection of weaker powers than it perhaps would be by a single equal power.

Finally, bipolarity should not be conceptualised as a system under which there are only two powers of *consequence* in the system: after all, in the Cold War (the classic 'bipolar' case), the contributions of West Germany, Japan, the United Kingdom and France to overall Western strength were far from trivial, while China's change of position was significant, and these states can accurately be conceptualised as major powers. As such, Copeland is correct that garnering powerful allies is an important step towards sustaining effective balancing and deterring aggression. However, the point about bipolarity as an

[41] (Copeland, 2000, p. 19)

analytical construct is that there are only two powers in the system with the military potential to aggressively threaten *all* of the others in some region of the world. As a corollary to this, each of these two powers is aware that – given the other's power – it cannot help but engage fully in the balancing process itself, since allies, while they may be capable, are not powerful *enough* to definitely prevent the other launching aggressive war against the system. Accordingly, the really salient point from a war causation perspective is that neither of the system's two principal powers has the opportunity to buck pass, thereby removing the principal source of uncertainty and power inequality that polarity theorists identify as making the international system conflict-prone. These two states will therefore continue striving to balance against each other, even if there is dynamic differential power change between the two. And of course, if one declines so far that it is no more powerful than its other significant allies, then the system has transitioned from bipolarity to unbalanced multipolarity – a negative development under both theories.

To conclude this chapter, polarity theory and dynamic differentials theory need not necessarily be viewed as distinct positions; both add explanatory strength to realist theories of conflict, and fusing the two results in a more comprehensive understanding of how changes in the balance of power generate conflict incentives. Figure 2 lays out this relationship between polarity shifts and dynamic power differentials in the context of catch-up growth, and also draws in the earlier discussion of the significance of population prerequisites in determining just how far catch-up growth can cause a state to rise. Dynamic differential growth of national power is also a process that can drive the international system towards greater multipolarity: *both* processes that can generate severe incentives towards aggression for one or more major states. Conversely, dynamic differential power growth can exacerbate conflict incentives under any given polarity configuration, although more stable configurations such as bipolarity may dampen these incentives. Crucially for my overall

theoretical argument, economic integration is capable of generating both a move towards greater multipolarity *and* dynamic differential power growth between the existing major states, via differential growth of national wealth, both of which are processes that can generate serious conflict incentives.

Figure 2. Power Consequences of Catch-Up Growth for States of Different Population Sizes

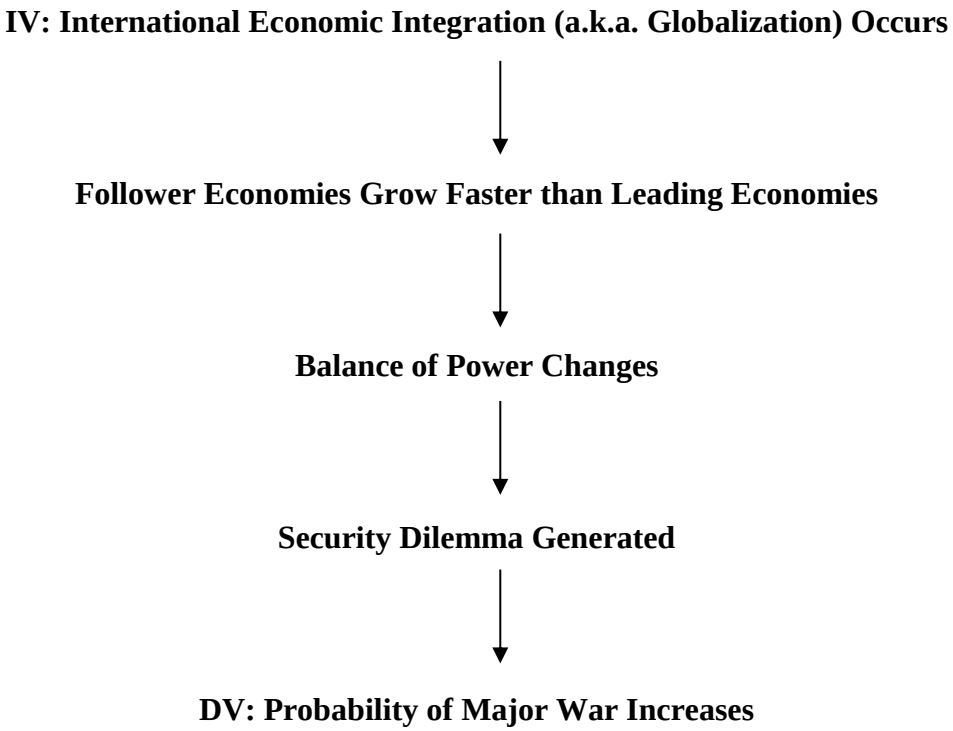
	Small Follower Economies	**Large Follower Economies**
Small Leading Economy(s)	Integration-driven catch-up growth causes aggregate GDP convergence, but *neither group of states large enough to become great powers* (although *dynamic differentials* could conceivably be significant at the regional level in a geographical area of limited external great power involvement)	Less developed states' aggregate GDP already as large or larger than most developed states' aggregate GDP: per capita catch-up growth simply widens larger states' aggregate lead, so *no polarity shift*, but *dynamic differentials* still likely to be significant (contemporary China and Taiwan scenario)
Large Leading Economy(s)	Follower economies experience catch-up growth towards leading economy levels of per capita development, but lack population prerequisites to become peer great powers to the leading economy(s), so *no polarity shift* (intra-G5 experience in Cold War), but *dynamic differentials* still likely to be significant (G5 versus USSR; US fears over Japan, ~1989)[42]	Follower economies experience catch-up growth towards leading economy(s), which is already a great power, and their aggregate GDP grows to the point where they too become great powers: ***Polarity Increases* and *Dynamic Differentials***

[42] These empirical references are explained in Chapter VII.

IV. Summarising, Situating, and Bounding the Argument

Chapters II and III described in detail the various stages in this dissertation's overall theoretical explanation of war-causation. The purpose of this chapter is to summarise these stages into a concise whole (see figure 1, repeated from Chapter I), situate the argument within the broader international theoretical literature, and lay out the theory's limitations. In short, the chapter seeks to describe the areas of international conflict that the theory can explain, but also those that it cannot.

Figure 1. Integration-Convergence Conflict Theory



The argument presented in Chapter II outlined how periods of deepening international economic integration cause large-but-underdeveloped economic 'follower' states to grow much faster than 'leading' economies, thanks to the diffusion of skills and capital inherent in international trade, cross-border financial flows, and international technology transfer. Since copying is cheaper and faster than innovation, the result is that follower economies' can

converge towards the size and development levels of the largest economies in the international system. Insofar as aggregate national wealth is the ultimate bedrock of military capability, the implication is that periods of deepening international economic integration cause the rise of new great powers.

Chapter III followed this demonstration of the underlying economic mechanism involved in the rise of new great powers with an analysis of how this rapid change in the balance of power generates conflict incentives. The rise of new great powers, coupled to the relative decline of others, can create a situation of unbalanced multipolarity in a given region or, indeed, at the global level. Multipolarity – a situation of three or more great powers – is a particularly war-prone configuration of the international system, due to the expanded number of great power dyads, the increased likelihood of substantial dyadic power inequalities, and elevated uncertainty over other states' willingness to balance against potential aggressors, due to their incentives to buck-pass. As a result, insofar as economic integration can add 'poles' to the international system, it can also make the system more war-prone. Likewise, the dynamic process of major powers rising and falling vis-à-vis each other can function as a further potent source of conflict incentives. Declining powers have incentives to retard the rise of new powers, given the threat that rising power could go on to pose. Conversely, rising powers have incentives to reorder the international system in their favour by accruing power as quickly as possible, given that this is their own best route to security. The interaction of these two effects can be a potent source of an acute security dilemma, given that each side will be aware of the incentive structure faced by the other.

An outstanding puzzle for consideration at this stage is, if international economic integration drives the relative decline of pre-existing lead economies, why do these states drive a process that will ultimately reduce their relative power? The involvement of weaker states in international economic exchange – even when it might go against their interests – is

readily understood in power politics terms,[1] but the involvement of great powers in potentially-disempowering exchange is more of a puzzle. First, states' leaders may simply not grasp the situation; this would essentially be a bounded rationality argument, on the grounds that while lead states may see maximizing profits from trade, foreign investment, and technology transfer as rational, they do not grasp the future knock-on irrationality of facilitating commerce that in turn drives their own decline.[2] Second, statesmen may grasp what is going on at the macro level, but remain politically beholden at the domestic level to economic groups with an interest in profiting from integration; again, this would suggest limits to the state's 'rationality' in foreign policy.[3] Third, it may be a purely rational response in the presence of a future discount rate, by which gains in the present outweigh potential losses in the future.[4]

Fourth, however, it may simply be that leading states conclude that their payoff will be higher from being involved in international commerce – even if it ultimately contributes to their disempowerment – than if they retreated into autarky. This could occur because of a collective action problem: say, if the United States concluded that there was no point trying to slow China's rise via economic containment, since non-US economic partners would simply step in to reap profitable business opportunities.[5] Or crucially, it could occur simply because the leading economy thinks that its lead would *also* be eroded by a retreat into autarky, meaning that integration – and the growth it can facilitate for all parties, even if that growth is

[1] (Gruber, September 2001)
[2] On bounded rationality's implications for political science and world politics, see (Faber, August 1990; B. D. Jones, 1999; Kahler, Autumn 1998)
[3] On domestic pressures driving international economic integration, see, for example, (Milner & Tingley, Winter 2011)
[4] This is essentially the 'guns versus butter' trade-off between securing future consumption (guns) and present consumption (butter): if the former is heavily discounted, then there will be a focus on the latter: (Fearon, August 2011, pp. 436-438; Powell, 1999, pp. 3-39; March 1993)
[5] On collective action problems as an obstacle to effective containment strategies, see (Olson & Zeckhauser, August 1966)

differentially weighted – remains the first-best option.[6] Empirically, however, the important point is that such integration *does* happen, for whatever reason, meaning that investigation of causation can be bracketed for future research.

Positioning Integration-Convergence Theory within the Existing Literature

Where does this dissertation's argument sit vis-à-vis prior scholarship on the relationship between commerce and war? Robert Gilpin observed in 1981 that,

> ...a world market economy fosters the spread of economic growth throughout the international system. Through trade, foreign investment, and the transfer of technology, wealth and economic activities tend to diffuse from the old centers to new centers of economic growth. Enjoying the "advantages of backwardness"...these new centers frequently overtake and surpass the original center.[7]

He goes on to explain that,

> ...they ["backward societies"] can adopt the most advanced and thoroughly proven techniques, whereas prior research-and-development costs and vested interests deter the more advanced economy from substituting the very latest techniques for obsolescent techniques. Thus, with lower costs, untapped resources, and equivalent technology, backward societies frequently can outcompete the more affluent society economically or militarily.[8]

These arguments – which echo earlier claims from Alexander Gerschenkron about the 'advantages of backwardness' – come closer than any other previous systematic account to this dissertation's theoretical argument, insofar as Gilpin suggests a relationship between features of the international economic system and the power shifts that drive war.[9] However, Gilpin never develops this line of reasoning into a theory of war-causation in which economic integration functions as the independent variable. Moreover, the very characterization of the

[6] This is essentially a variant of Duncan Snidal's argument for why cooperation can occur even in the presence of relative gains, once more than three significant actors are present: (Snidal, September 1991)
[7] (Gilpin, 1981, p. 178)
[8] (Gilpin, 1981, pp. 178-179)
[9] This process of what Gilpin calls 'polarization and spread' is described in more detail in (Gilpin, 1975, pp. 47-59) Alexander Gerschenkron's seminal ideas are laid-out in (Gerschenkron, 1962, pp. 5-30)

international system as anarchic is incompatible with hegemonic stability theory, Gilpin's variant included. Given that this dissertation develops a theory based around the empirically-supported notion of multiple competing great powers, anarchy seems a more appropriate assumption than hegemony, marking a further significant distinction from Gilpin's work. Integration-convergence is not a theory about hegemonic transitions or follower economies *out*-competing the lead economies by economic 'leap-frogging,' because such a contention lacks adequate micro-foundational support; rather, it is about the *closing* of gaps and the *convergence* of power, resulting in multipolar, dyadic competition.

Other scholars have also touched upon the causal mechanisms that this dissertation identifies. Dale Copeland notes, in the context of the contemporary rise of China, that,

> ...the United States faces a clear problem. Continued engagement will help China grow in relative economic power. This increased power, if translated into military power, reduces the costs of Chinese expansion.[10]

Such recognition demonstrates an understanding of the mechanism described in this dissertation, although it stops short of providing a systematic theory of war-causation.[11] Likewise, Andrew Hurrell – following Adam Smith – observes that eras of economic globalization can serve as a potent driver of force equalization between rising powers and established powers. Again, however, Hurrell is also not attempting to build a theory of major power war.[12] And while Edward Mansfield identifies a connection between power, trade and war, he focuses on power as a determinant of war and trade, rather than trade as a driver of power shifts.[13]

[10] (Copeland, 2003, p. 324)
[11] Note also that Copeland has suggested in other work that shifts in the pattern of trade ties can cause major power war, but this argument is based on a wholly different mechanism to the one I describe. Specifically, he argues that whether or not economic interdependence promotes peace is contingent on states' expectations of *future* trade benefits; hence it is still essentially a story about the potential stabilizing effects of interdependence, albeit a nuanced one: (Copeland, Spring 1996)
[12] (Hurrell, 2007, p. 215)
[13] (Mansfield, 1994)

For their part, Charles Doran and Wes Parsons develop a theory of war extensiveness that traces causation back to inflection points in major powers' economic capability cycle, but without linking those inflections to the depth of international economic integration.[14] The same is true of Paul Kennedy's seminal account of the economic rise and fall of great powers, and the connection of economic change to major war: his argument shares much with this dissertation's theory, but lacks a connection between economic change and variation in international economic openness.[15] Meanwhile, Katherine Barbieri demonstrates that trade does not necessarily promote peace and can even cause conflict, but her work does not develop a broader theory of how economic integration (including finance and technology diffusion, as well as trade) shifts the balance of power.[16] Furthermore, while Mansfield and Brian Pollins touch on the idea elucidated earlier by Albert Hirschman that the benefits of economic interdependence may accrue differentially, with potentially negative consequences for major power relations – an intuition that underpins the pessimism of those who see relative gains concerns as likely to hinder international cooperation – their volume does not contain an elaboration of this insight into a theory of war-causation.[17]

There is also a striking overlap between this dissertation's theoretical argument and various Marxist arguments about world politics. In arguing that the structural forces of global commerce can in turn impel (capitalist) states towards aggression, there is some commonality

[14] (Doran & Parsons, December 1980) On cyclical theories of international systemic change and conflict more generally, see (Gaddis, Winter 1992-1993, p. 16; Modelski, April 1978; Rosecrance, Spring 1987)
[15] (Kennedy, 1987) Henry Nau contended in 2001 that the lack of role for domestic variables in Kennedy's story explained why, contrary to his predictions, US and Western European power was revitalised in the 1990s while the Soviet Union collapsed and Asia, most notably Japan, atrophied: (Nau, October 2001) However, this dissertation has stressed the importance of domestic variables in harnessing catch-up growth potential, and the associated power gains, throughout: another measure by which its provision of underlying economic micro-foundations goes beyond Kennedy's argument. It is also worth noting that, as discussed at the outset, states are more likely to economically adapt and subsequently reap relative power growth over the long term, even if their institutions and policies are insufficient to reap such gains initially – and Asia's catch-up growth since Nau's article was published supports this view, as well as suggesting that Kennedy was less incorrect than he appeared in 2001.
[16] (Barbieri, February 1996) Her arguments are developed in (Barbieri, 2002)
[17] (Mansfield & Pollins, 2003, p. 3) For the argument that the differential gains likely to be entailed by international economic exchange serve as a barrier to major power cooperation, see (Grieco, August 1988; Mearsheimer, Summer 1990, pp. 44-45)

of argument between this dissertation's theory and Vladimir Lenin's 1916-17 work on imperialism.[18] And as noted on the first page, the argument about catch-up growth causing power shifts shares common ground with Leon Trotsky's account of Russian development.[19] Moreover, the argument that the visible manifestations of international politics – war, diplomacy, alliances, and so forth – are in some sense a superstructure that rests on an underlying bedrock of the shifting distribution of global industrial production has a distinctly Marxist flavour. However, this dissertation does not suggest that capitalism will necessarily destroy itself; on the contrary, as the catch-up process demonstrates, market exchange underpins growth, and thus power. As such, the structural incentives detailed here are common across states of varying modes of domestic political organisation, not just capitalist empires. Accordingly, this dissertation fills an important scholarly gap, despite pre-existing areas of overlap.

The Theory's Substantive Contribution to Scholarship

Given this appreciation of the gap in which this dissertation's theory fits, let us consider the contemporary scholarly debates that will be contributed to by its findings. The first area where this dissertation makes an important contribution is on the nascent debate over the international security implications of economic globalization. Globalization's impact on levels of weak state, sub-state, and intra-state violence has been extensively studied; indeed, the world's best-selling IR textbook is specifically formulated in terms of the impact of globalization on international politics.[20] However, in looking at the implications of *economic* globalization for the stability of *major power* relations, Stephen Brooks' 2005 book *Producing Security* represented the first significant scholarly work.[21] Since then, a small

[18] (Lenin, 1939)
[19] (Trotsky, 2008 [1932], p. 4)
[20] (Baylis & Smith, 2005)
[21] (Brooks, 2005)

number of scholars have looked into the relationship between economic globalization and major power peace, but the literature remains underdeveloped for an issue of such pressing importance.[22]

Brooks finds that economic globalization – or, more specifically, the 'globalization of production' inherent in the global FDI operations of multinational corporations (MNCs) – stabilizes major power relations in three ways. First, Brooks argues that the globalization of production significantly reduces the economic benefits of conquest.[23] This is because (a) a conqueror will not be able to signal its economic credentials to MNCs that base production in the vanquished state, (b) the geographic dispersion of production across the globe reduces the economic benefits of conquering any one state, and (c) extracting wealth from conquered advanced knowledge-based societies is unlikely. Second, production globalization creates new pressures for regional integration amongst major states in the developing world, thus changing the nature of affected states' relationships from hostility to partnership.[24] Third, Brooks argues that the complexity and technological advancement of modern weaponry has rendered a strategy of internationalisation of procurement the only viable means of remaining at the cutting-edge of modernity. But this being the case, states that attempt serial aggression are likely to face an international supply cut-off, thus curtailing their war-making potential; Brooks argues that expectations of such an outcome will likely to deter them from launching aggression in the first place.[25]

The theory in this dissertation does not directly challenge the three hypotheses that form the core of Brooks' argument. However, it *does* suggest a powerful countervailing mechanism to the one identified in *Producing Security*: it may not matter that production globalization functions as a 'reserve stabilizer' of great power relations if that stabilizer is

[22] Recent notable contributions include: (Brooks, October-December 2007; Caverley, October-December 2007; Gholz, October-December 2007; Kirshner, Fall 2008, October-December 2007, 2006; Mabee, 2009)
[23] (Brooks, 2005, pp. 57-71)
[24] (Brooks, 2005, p. 71)
[25] (Brooks, 2005, p. 76)

overwhelmed by the aggression incentives generated by an economic globalization-driven shift in the balance of power.[26]

Following from this, the dissertation also represents a substantive contribution to the broader IR theory debate. Brooks' work can be seen as a sophisticated recasting of the long-standing proposition in IR scholarship that deepened economic interdependence promotes peace, since all states have more to lose from the breakdown of the liberal international economic order.[27] Again, while not going after the underlying causal logic of this position, the dissertation's theory does suggest that a potent countervailing mechanism could be at work. As such, if my argument garners empirical support, then this suggests that the aggression incentives produced by the power shifts brought about by international economic integration can often be sufficient to overwhelm the interdependence mechanism.[28] That would be a problematic finding for the economic interdependence strand of liberal theory, and a supportive finding for alternative interpretations of the link between international commerce and major power security relations.

A complementary finding to that described above is that the dissertation's theory, if supported empirically, may significantly bolster structural realist explanations of conflict in an area where they have traditionally been seen as weak. Realist theory can be criticised for failing to go inside the 'black box' far enough to explain *why* great powers rise and decline:

[26] For Brooks' defence against the charge that his mechanism only constitutes a 'reserve stabilizer' (at best), see (Brooks, 2005, p. 217)

[27] For a seminal early articulation of the notion that international economic connectedness had made war futile – although not one that said such connectedness made war impossible, as it is often straw-manned as claiming – see (Angell, 2007 [1912]) The contemporary position is intertwined with the argument that liberal democracies are less likely to fight each other, since economic liberalism is often a corollary of political liberalism. See, for perspectives embodying one or both positions, (Doyle, 1996, pp. 26-30; Gartzke, January 2007; Gelpi & Grieco, 2003, pp. 45-46; Mansfield & Pollins, 2003, pp. 2-3; Oneal & Russett, July 1999, June 1997; Polachek, August 1997, March 1980; Rosecrance, 1986)

[28] Note that this finding would also not be undermined by the robust statistical correlation between high levels of international economic integration and major power peace. On the contrary, these two findings would be entirely consistent with each other: if integration deepens during periods of major power peace, but then drives a relative power shift that ultimately produces integration incentives, then we would still expect to see a correlation between economic integration and peace. For early quantitative tests of the statistical association between higher economic interdependence and lower conflict, see (Gasiorowski, March 1986; Gasiorowski & Polachek, December 1982; Polachek, March 1980) For a more recent 'definitive' account, see (Oneal, 2003)

while realists have a compelling account of why the size of the 'billiard balls' matters for international conflict, an explanation for the dynamic shifts in the size of those billiard balls is lacking.[29] Of course, realists can code great powers as being 'created' or 'destroyed' by states' relative success in major war (an *effect*), but this leaves them with an endogenous cause/effect feedback loop insofar as the relative rise and decline of great powers is also held up as a principal *cause* of war in realist theory. In short, structural realism needs to account for the relative rise and decline of great powers in the *absence* of major war if it is to have a compelling explanation for *why* major war occurs; this dissertation provides such a footing.

Moreover, since the explanation in question is predominantly structural – namely, levels of international economic integration – this supports varieties of realism that retain a large structural component in their account of international outcomes, even while there are also unit-level micro-foundations, insofar as states drive economic integration and in turn respond to structural incentives in formulating political responses. Accordingly, the theory presented here can be seen as conforming to Charles Tilly's notion of states whose capabilities are shaped by the system, but whose capabilities also in turn structure the system, providing effective explanations of international outcomes at both the second- and third-image levels.[30] In doing so, this dissertation addresses the charge that for structural realism to move forward as a progressive research agenda, it requires elaboration with adequate micro-foundations.[31] By integrating the underlying economic structural mechanisms that account for the relative rise and decline of great powers, the theory presented here answers this call for explanatory micro-foundations. The tangible results of integrating both underlying economic mechanisms into neorealist theory are immediately obvious: suddenly some of the empirical

[29] (Dunne & Schmidt, 2005, p. 177)
[30] (Tilly, 1992) On different levels of analysis in international politics, see (Waltz, 2001 [1959])
[31] On the charge that structural realism has become a degenerative research programme and subsequently is in need of rejection, see (Vasquez, December 1997) For takes on how micro-foundational elaboration may restore the progressiveness – and, indeed, the explanatory power – of structural realist approaches, see (Freyberg-Inan, Harrison, & James, 2009, pp. 3-10; James, 2009)

puzzles most commonly held up as challenges to structural realist accounts of world politics become less problematic.[32]

Moreover, the entire framework presented here is also entirely consistent with the recent 'neoclassical turn' in much realist scholarship, since neoclassical realism still attributes a large role to structural pressures. The neoclassical realists' observation that states' real-world responses to these structural pressures are filtered through the lens of domestic political concerns does not diminish the salience of this dissertation's contribution, since both structural *and* neoclassical realists need an explanation of the sources of systemic pressures.[33]

Going beyond the political science side of the IR literature, the dissertation also helps to inform historical accounts that have observed the link between shifts in the economic balance of power and patterns of great power military conflict. Most notably, as outlined above, it can be taken be taken as providing additional explanatory underpinnings to Kennedy's observations on the historical relationship between economic change and military strategy.[34] For Kennedy, the explanation for the rise and fall of great powers is differential economic growth caused by shifting patterns of global production.[35] These shifts are, in turn, driven by shifting patterns of technology, production modes, trade, and knowledge absorption.[36] The decline of leading powers can be exacerbated by imperial 'overstretch' – the growing disparity between the declining power's commitments and capabilities – but core

[32] The most striking single instance of an international event that some scholars alleged to have falsified structural realism was the largely peaceful end of the Cold War. For arguments expressing this position, see (Gaddis, Winter 1992-1993; Kegley, June 1993; Koslowski & Kratochwil, Spring 1994; Lebow, Spring 1994; Schroeder, Summer 1994) Questioning whether realism was still a fruitful theoretical terrain in the wake of this experience were (Kapstein, Autumn 1995; Legro & Moravcsik, Fall 1999; Zakaria, 1992-1993) Refuting these charges in defence of the continuing salience of the realist research programme have been (Brooks & Wohlforth, Winter 2000-2001; Mearsheimer, 2001; Schmidt, July 2004; Waltz, Summer 2000; Wohlforth, Winter 1994-1995)
[33] (Kitchen, January 2010; Lobell, Ripsman, & Taliaferro, 2009; Rose, October 1998; Schweller, 2006)
[34] (Kennedy, 1987)
[35] (Kennedy, 1987, p. 439)
[36] (Kennedy, 1987, p. 439)

economic factors remain the primary source of countries' relative rise and decline.[37] Integration-convergence theory can thus fulfil its role at the 'next level down' in Kennedy's story: it provides a compelling explanation of *why* these relative shifts in technology, trade, production modes, and knowledge occur.

So, in terms of the argument advanced in this dissertation, the realist theory outlined in Chapter III can explain how shifts in the balance of power actually produce aggression incentives. Moreover, the economic mechanism outlined in Chapter II can explain how the actual relative power shifts happen. Kennedy and others are correct to demonstrate that great powers' military overstretch almost invariably accelerates their relative decline.[38] But importantly, the argument presented here shows that this relative decline can come about regardless of great powers' military overstretch. In short, there are structural features of the international system – namely, the convergence forces of deepening international economic integration – that may bring about the economic and subsequent military rise of new great powers *irrespective* of the strategies of the pre-existing dominant powers. This conclusion does not diminish the highly significant parallel finding that declining powers can exacerbate their situation through overstretched strategic commitments.

Finally, the theoretical arguments and empirical evidence presented in the dissertation bear considerably on contemporary debates over the future of twenty-first century great power relations. In particular, the relative rise of the so-called 'BRICs' (Brazil, Russia, India and China), the relative decline of the United States and other G5 states (Japan, Germany, France, and the United Kingdom), and the possible coming of multipolarity following the post-Cold War 'unipolar moment' are all international phenomena that it will be important to understand over the coming decades.[39] The integration-driven power convergence hypothesis of this dissertation directly challenges a variety of arguments that have asserted that the

[37] On the role of overstretch in accelerating great powers' relative decline, see (Kennedy, 1987, p. 515)
[38] For a contemporary version of the overstretch/decline argument, see (Adams, 2005)
[39] For one such effort in the context of the rise of China, see (Christensen, Summer 2006)

prevailing dominant economies benefit differentially from the structure of international commerce, extending their hegemony.[40] Such a finding, if confirmed, would have significant implications, bolstering the arguments of scholars who see the relative decline of the United States in overall strategic terms as an inevitable corollary of the diffusion of economic power to emerging states.[41] Even more importantly, this dissertation will inform attempts to understand the likely consequences for patterns of major power cooperation, competition and even war of this shift in the global balance of power. If (potentially unbalanced) multipolar international systems characterised by rapid dynamic differential change in relative power are particularly war-prone, but various factors discussed below can intervene to prevent aggression incentives turning into outright war, then this is a conclusion of importance to future international security policy-making. The implications of this dissertation's theoretical and empirical findings for contemporary and future international relations and patterns of conflict are returned to in the concluding chapter.

Limits to the Theory: Scope Conditions and Falsification Parameters

No theory of war causation can purport to explain every single instance of major power conflict. Moreover, given that this dissertation effectively takes the causal logic one step further back compared to previous structural realist theories – it looks at the economic *causes* of a change in the balance of power, rather than the solely the *consequences* of change – there is correspondingly greater scope for alternative independent and intervening variables to affect outcomes. Accordingly, the theory presented here must acknowledge its limits. Moreover, before proceeding to case study testing, it is also important to identify what set of possible empirical evidence would falsify the theory. Both of these questions are addressed below.

[40] (Kirshner, Fall 2008, p. 363; Krasner, April 1976)
[41] (Pape, January 2009) On the demise of unipolarity more generally, see (Layne, Fall 2006, Spring 1993)

First, economic power shifts can occur even in the absence of international economic integration, which means that integration cannot be considered a sole 'master variable.' States can tap previously underexploited natural resource endowments (think of modern Russia's oil boom), expand their territory (think of the nineteenth-century United States, although this would be harder to achieve without war nowadays), and make their own rapid technological progress (although as Chapter II showed, this tends to be slower and more costly than absorption). Start-of-period factor endowments, and the quality of domestic policies and institutions, are clearly of pivotal importance in explaining growth outcomes.[42] Furthermore, as noted above, states can pursue 'irrational' economic and military policies that reduce their overall power (think of Soviet economic policy beyond the immediate post-World War II period, or British military overstretch coupled to an inefficient imperial trading system in the early twentieth century). Nonetheless, these qualifications do not diminish the salience of this dissertation's theoretical focus on international economic integration as a driver of relative power shifts and subsequent root cause of conflict; they simply prompt us to be aware that other, non-systemic factors can also drive such a relative power shift.

Second, major wars themselves can alter polarity, by knocking out great powers; consider the relative standing of the United States and Soviet Union, on the one hand, and Germany, Japan, the United Kingdom and France, on the other hand, in the aftermath of World War II. As identified above, an overreliance on war outcomes as an explanation for the international polarity that follows is a weakness of previous structural realist theory, which is one reason that the theory proffered here fills an important gap in the literature. However, this awareness does mean that the integration-convergence model presented here must admit a significant degree of endogeneity between a previous major power war and the conflict-proneness of the international system that follows it. Again, this does not diminish the

[42] On the importance of domestic policy choices for leveraging the forces of globalization to national benefit, see (Rodrik, 2007, p. 2) Likewise, on the significance of domestic economic institutions for structuring the manner in which states interact with – and benefit from – international economic integration, see (North, 1990)

theoretical contribution of this dissertation, since whatever the 'starting polarity,' the point is that economic integration can drive relative power shifts that increase polarity, or at least generate destabilising dynamic differentials. But it remains an important point to bear in mind.

Third, and perhaps most importantly, major wars can break-out in the absence of any significant economic power shift. There are a number of other explanations for why major wars start, and while the theory and empirical evidence presented in this dissertation is directed towards assessing the merits of a particular balance-of-power account of war-causation, this does not necessarily diminish the validity of other approaches.[43] In particular, any theory that is predominantly structural must concede the ability of first- or second-image (that is, unit-level) factors to act as a catalytic 'exogenous shocks' that help tip the international system into war. The rapid rise of Germany may have made World War I possible, but neither unbalanced multipolarity nor dynamic differentials can fully explain the assassination of Archduke Franz Ferdinand on 28 June 1914. Indeed, while a variety of alternative war explanations – such as those looking at the role of leaders' (mis)perceptions, the role of expected utility calculations, and the role of unexpected crises with escalation potential – can all be largely incorporated into the theory presented here, explanations that look at particular domestic political pressures for aggression cannot.

Yet there can clearly be a role for such domestic war pressures, as even some of the most committed structural realist theorists concede, and any good systemic theory must acknowledge this limitation.[44] Structural theories can be useful tools for explaining

[43] The Spring 1988 special issue of the *Journal of Interdisciplinary History* provides one of the most effective overviews of the differing theoretical accounts of major war-causation. That this dissertation fuses the polarity and power transitions approaches – with perceptions of the offence-defence balance brought in at the intervening level – does not diminish the salience of other approaches. For accounts that go beyond the polarity and dynamic differentials approaches, see (Bueno de Mesquita, Spring 1988; Jervis, Spring 1988; Levy, Spring 1988; Quester, Spring 1988) For a summary of how the differing perspectives fit together, see (Nye, Spring 1988)

[44] (Mansfield & Snyder, 2005; Mearsheimer & Walt, 2007; Rose, October 1998; Snyder, 1991)

international tensions, but are weaker at predicting when a first shot will be fired. Such a finding does not reduce the value of structural theories *per se*: after all, as Copeland observes, unit-level domestic political pressures *alone* have rarely been sufficient to drag the whole international system into war in the absence of structural aggression incentives, and the notion that structural pressures are in practice *interpreted* through the lens of domestic politics forms the basis of the neoclassical realist research programme.[45] Nonetheless, this is another scope condition to bear in mind.

Fourth, as stressed in Chapters II and IV, 'international economic integration' (the independent variable) is a continuous variable, not a dichotomous variable. So, it is not helpful to say that in an 'integrated' world there will definitely be power convergence that produces conflict incentives or that in a 'non-integrated' world there will definitely not be such conflict incentives, since these are both abstract ideal-types. The implication is that the variable must be treated as impacting the *probability* of war, as opposed to definitely ensuring that it will or will not come about. This is a common and largely intractable problem in social scientific research, and it does not necessarily undermine the value of the overall argument.

Fifth, of course, there remains scope for intervening variables to prevent an integration-induced power shift being manifested as actual conflict.[46] For one, the offence-defence balance – that is, the relative ease of conducting versus resisting military aggression – can play an important role in determining whether aggression incentives result in fighting.[47]

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[45] (Copeland, 2000, p. 22) Moreover, as Alexander Wendt notes, the fact that domestic factors contribute to states' behaviour does not in itself reduce the value of theorizing at the level of the international system in cases where the system impacts upon the units: (Wendt, 1999, pp. 13-15)

[46] Indeed, this is why nothing in this dissertation contradicts recent research on the feasibility of declining great powers conducting a managed retrenchment: (MacDonald & Parent, Spring 2011) After all, the argument that declining states face incentives to retard rising peer-competitors and the argument that declining states can find ways to roll-back their strategic commitments when need dictates are not mutually exclusive.

[47] See, for example, (Glaser & Kaufmann, Spring 1998) For a recent intervention, see (Blagden, Levy, & Thompson, Fall 2011, pp. 195-196) The independent *causal* power of the offence-defence balance is contested, most notably by Keir Lieber, but his critique does not undermine the argument that the relative ease of attack

A declining state's preference for the balance of power to remain unchanged is nevertheless unlikely to be manifested as 'hot' war with a rising power if technological and geographical conditions mean that each side finds itself with little prospect of improving its security situation through aggression.[48] Next, there may be at least some scope for institutional enmeshment, of either the international kind (regimes) or the domestic kind (liberal democracy), to bind all major states into a pattern of non-violent dispute resolution.[49] Moreover, the argument presented here does not preclude the transformation of anarchy to produce a situation where states view each other as friends and enjoy a culture where the welfare of other states is valued in itself.[50] Finally, of course, economic interdependence itself is undoubtedly capable of raising the costs of engaging in aggression. As stressed throughout, this dissertation does not dispute the underlying logic of this latter assertion; it merely suggests a countervailing mechanism, which can be shown both theoretically and empirically to be influential. Investigating the precise conditions under which power shifts lead to war is thus a promising avenue of enquiry in international relations.[51]

In sum, the arguments above do not undermine the value of the dissertation's theory; they simply point to its scope conditions. At the conclusion of this chapter, then, let us ask: what *would* truly falsify the integration-convergence argument? Put simply, two possible empirical outcomes would throw the theory's explanatory claims into serious doubt. First, the theory would be called into serious question – and potentially falsified, depending on a micro-level analysis of causation – if economic integration deepened significantly but there were no significant growth differentials, even over the long term, and there were thus no dynamic power shifts as a consequence. Second, the theory would be falsified if integration-

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and defence serves an important *intervening* role between political conflict incentives and the outbreak of war: (Lieber, 2005)

[48] This argument is similar to that of (Montgomery, Fall 2006)

[49] For an overview of the potential merits of international institutionalist approaches, see (Keohane & Martin, Summer 1995) On the pacifying potential of domestic institutions see, for example, (Lipson, 2003)

[50] (Wendt, Spring 1992)

[51] See, for example, (Debs & Monteiro, forthcoming, 2013; Kim & Morrow, November 1992)

driven power shifts were observed, in line with the theory's predictions, but there was no visible uptick in security tensions and strategic competition between the major powers. Subsequent chapters, which turn to the empirical assessment of the theory presented above, will proceed with this understanding of what would constitute outright falsification as a continuous background consideration.

V. 1581-1795: An Early Example? Commercial Engagement, the Rise of and Decline of the Netherlands, and Major War in the Seventeenth and Eighteenth Centuries

This chapter analyses evidence from the period between 1581 and 1795 – that is, the period between the formation of the Dutch Republic as an independent federal state and the *de facto* end of Dutch sovereignty that came with the French-backed establishment of the Batavian Republic. It focuses, first, on the rise of the Dutch Republic, its economic drivers, and its consequences for major power competition and conflict in the period up to the end of the third Anglo-Dutch War in 1674. The focus then briefly switches to the decline of the Dutch Republic and the corresponding rise of England, its economic drivers, and the associated strategic consequences after 1674. The value of exploring this case lies in the Dutch Republic's status as the earliest instance of what we would now recognise as a modern economy, the expansion of international commerce – both within Europe, and intercontinentally – that occurred during this period, and the role of power shifts in understanding the major conflicts of the era. By considering the first 'modern' economy in this way, the case allows us to shed light on integration-convergence conflict theory's full potential historical coverage.[1]

At the outset, the argument made in this chapter merits qualification. First, the mercantilist international commercial order of this period was quite open on some metrics but quite closed on others. It certainly was not a liberal world market economy directly comparable to that of today or even, indeed, to the integrated international commercial order

[1] On the idea of the Dutch Republic and its commercial order representing the first 'modern' economy – an economy displaying several characteristics of industrialisation before that label itself existed – see (de Vries, October 2000; de Vries & van der Woude, 1997; Riel, March 1996) Note, however, that Peter Musgrave defines a given economy's 'modern' period as beginning when the economic and social system switched from domination by the owners and controllers of *land* (feudalism) to the owners and controllers of *capital*, which would date the beginnings of the early modern period as somewhat earlier and arising in Southern Europe (particularly the Iberian peninsula and Italian city states): (Musgrave, 1999, p. 3) It is also worth noting that the proliferation of the printing press throughout sixteenth century Western Europe can probably be seen as the single most important 'one-shot' contribution to modernity and subsequent economic development on the continent: (Baten & van Zanden, September 2008)

of the 1870-1914 period discussed in Chapter VI.[2] Second, this chapter does not contend that the only cause of the newly-independent Netherlands' spectacular rise during this period was integration-driven catch-up growth. On the contrary, domestic factors – republican economic, administrative and military institutions that were comparatively efficient relative to monarchical counterparts in other countries, the bond and stock markets, a powerful merchant class, high-quality educational institutions, geographical advantages, and so forth – represented crucial sources of increasing Dutch strength in the years following independence. Nonetheless, this chapter will demonstrate that some of the elements of economic integration identified by the theoretical discussion in Chapter II were present during this period and that they contributed substantially to the Netherlands' rise to great power status. Similarly, while the relative decline of the Dutch Republic from around the period of 1672's 'Year of Disaster' was exacerbated by domestic factors – most notably fiscal overstretch – integration also played a significant role in the rise of Dutch rivals – most notably England (Great Britain after the 1707 Acts of Union). Finally, it is worth explaining at the outset that the chapter says nothing about the Western European states' interactions with the Ottoman Empire – the power of which was only really curtailed for good in the latter seventeenth century[3] – in order to restrict the discussion to economic and power shifts within the Western European international system.

The chapter proceeds in six parts. First, it considers the extent of economic integration in the 1581-1674 period and the role that integration, such as it was, had on Dutch economic growth. Second, it considers the impact of that growth on the Netherlands' military power position and the effect that that, in turn, had on the major power competition of the time. Third, it discusses caveats to the pre-1674 integration growth story, discussing some of the domestic drivers of the Dutch rise briefly noted above. Fourth, it turns to an analysis of the

[2] (de Vries, August 2010, pp. 713-714)
[3] (Musgrave, 1999, p. 8)

role that economic openness played in the Dutch Republic's later relative decline. Fifth, it considers the role that this relative decline played in strategic outcomes after 1674. Finally, it again discusses caveats to the integration power shift story relevant to this post-1674 period.

International Commerce and Growth in the Dutch Golden Age, 1581-1674

In 1579, the seven northernmost provinces of the Spanish Netherlands formed the Union of Utrecht, a defensive alliance to protect their interests against their Habsburg imperial masters – and the hegemony of Holland within the Netherlands – that they had rebelled against in 1567-1572. Two years later, they declared their independence as the Republic of the Seven United Netherlands. By the early 1600s, this Dutch Republic – which had been a mere collection of rebellious provinces only slightly more than two decades earlier – had entered the ranks of Europe's great powers, with important implications for major power conflict in the period. This section first demonstrates that economic integration deepened along certain key metrics during this era; a period often known as the Dutch Golden Age.[4] It then proceeds to consider the impact that these elements of openness had on economic growth during the period, paying particular attention to the spectacular development of the newly-independent United Provinces.

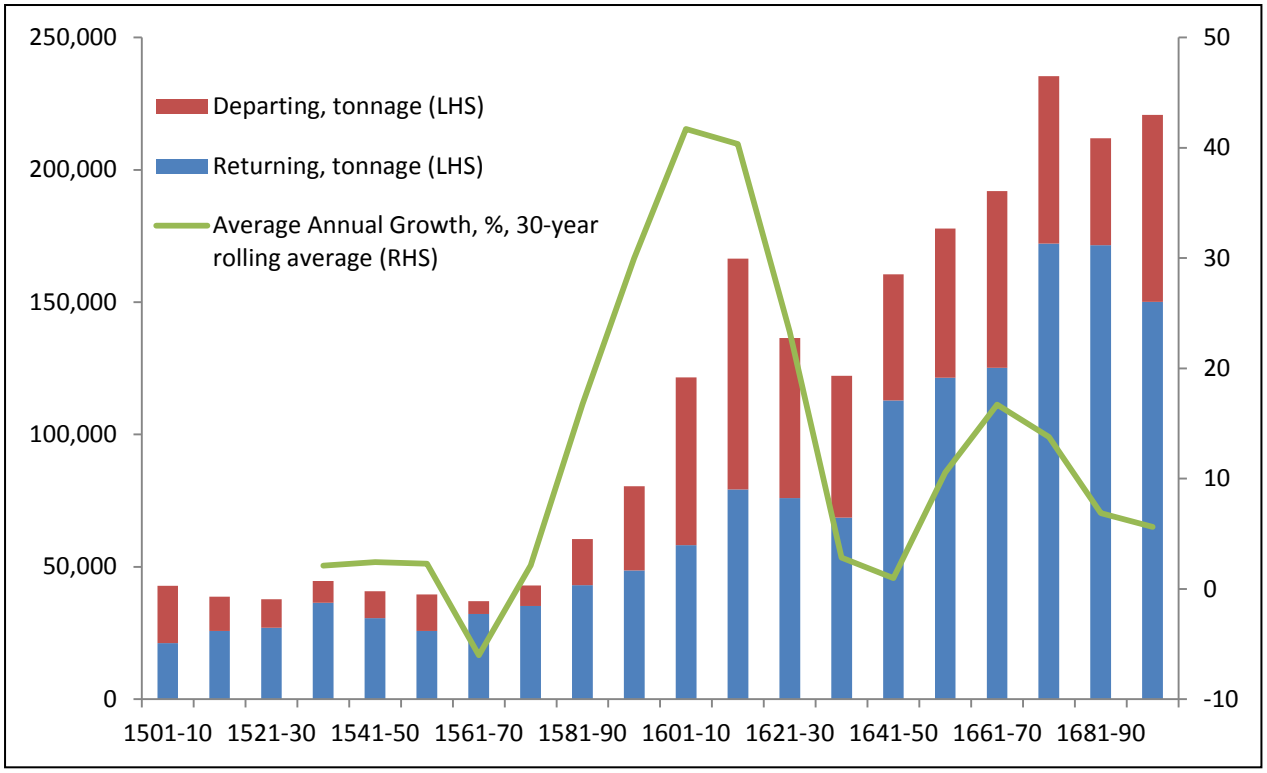
The Expansion of Trade in the Dutch Golden Age

International goods trade expanded throughout the 1581 to 1674 period, albeit with the usual cyclical intra-period ups and downs. This occurred both within Europe, and between Europe and other parts of the world, particularly Asia. The newly-independent Dutch Republic entered the hitherto English- and Portuguese-dominated (in northern Europe

[4] (Israel, 1995, p. 231)

and Asia, respectively) international commercial orders, proceeding to outcompete the previous leading traders on many key routes.[5]

Figure 1. The Growth of European Trade with Asia, 1501-1700



Source: de Vries (2010), p. 716. Full column (blue plus red) represents total merchant shipping tonnage departing for Asia; blue sub-column represents returning tonnage only. Growth refers to departing tonnage. In this and all subsequent charts, 'LHS' and 'RHS' refer to the left- and right-hand-side *y* axes, respectively.

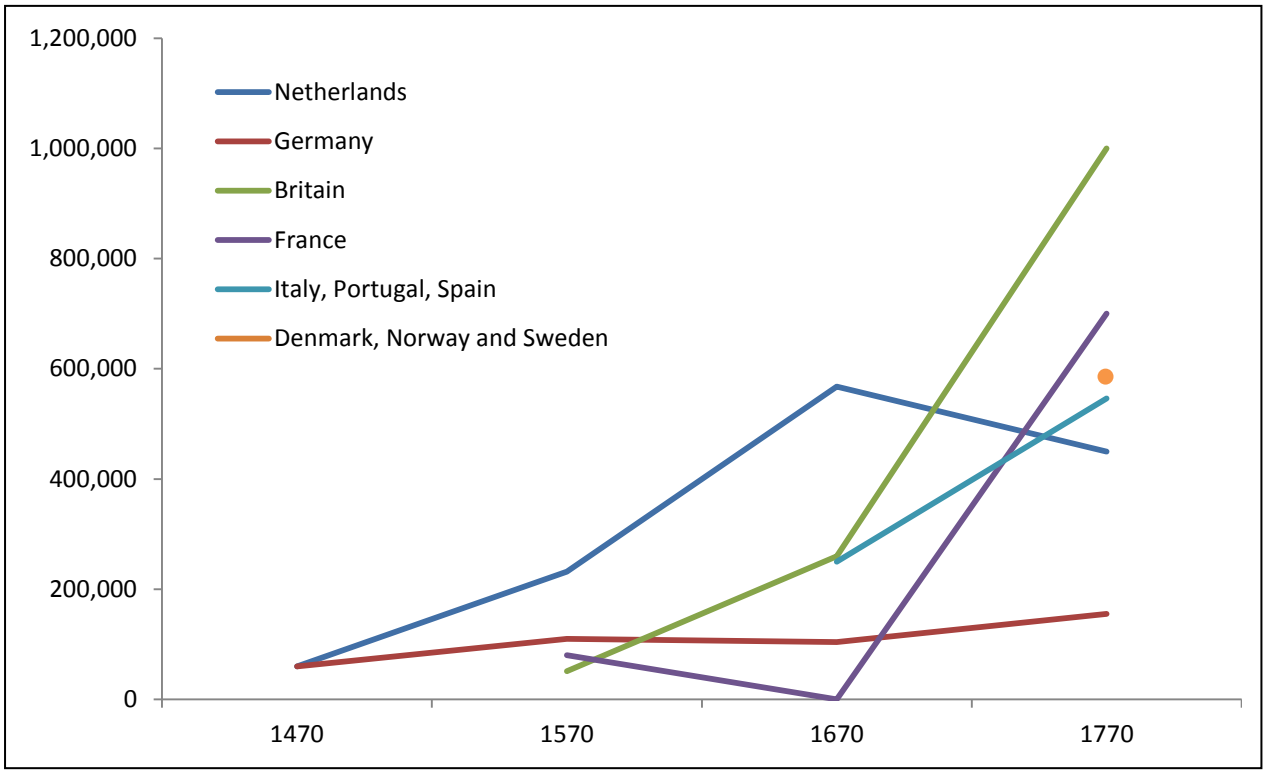
Figure 1 provides data on overall European trade with Asia during the 1500-1700 period, measured by the tonnage of merchant shipping departing to and returning from commercial destinations east of the Cape of Good Hope.[6] Clearly, shipping tonnage is an imperfect proxy for total trade growth – such data is as much evidence of the rise of a particular industry, the mercantile marine, as it is a precise estimate of the value of

[5] (de Vries, August 2010; Findlay & O'Rourke, 2007b, pp. 176-186; Israel, 1995, pp. 307-327, 713-715) To be sure, trade may only have accounted for around 2 percent of total European GDP in the post-Renaissance age at the zenith of Habsburg power, but (a) that does not refute the argument that it *expanded* significantly in the period under review, and (b) it does not refute the point that it was a contributor to strong relative *Dutch* growth – where trade *was* a much larger proportion of the economy – and that, as a corollary, a comparative scarcity of international economic flows contributed to weak relative growth in other European powers. On trade's limited intra-European extent in the aggregate at the beginning of the modern period, globalized anomalies such as the Netherlands notwithstanding, see (Watson, 2009, pp. 124-138)

[6] (de Vries, August 2010, p. 716)

international goods trade – but in terms of what is available, and given that the expansion of the merchant fleet is a product of demand for shipping of merchants' goods, it is a useful proxy nonetheless. And as the curve plotting the average annual growth of outbound tonnage on a thirty-year rolling basis makes clear, the years following Dutch independence in 1581 were characterised by a substantial expansion of European trade with Asia.

Figure 2. The Growth of Major Economies' Merchant Fleets, tonnes, 1470-1770



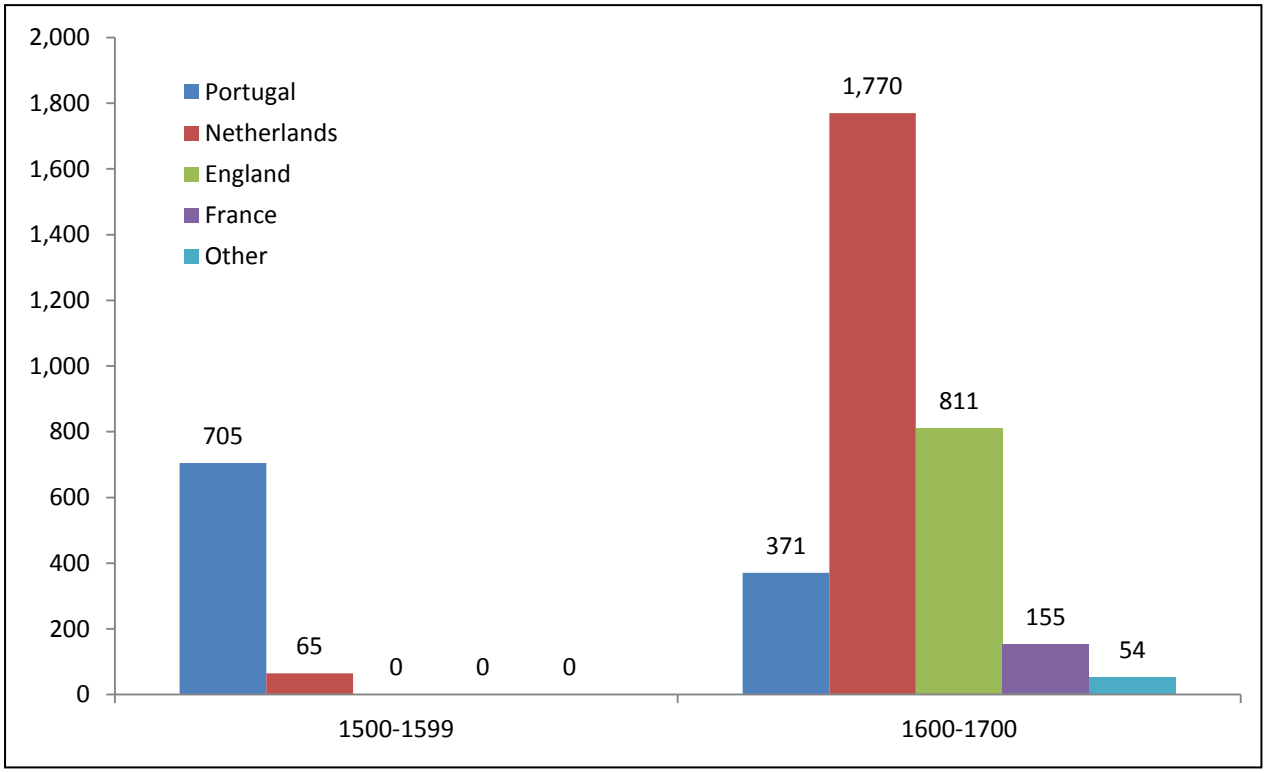
Source: Maddison (2003). Data is for contemporary borders of states; hence the 'Germany' figure, for example, would actually be shared by the various states that then constituted what became modern Germany.

Figure 2 adds to this picture of maritime commerce – and the growth of the Dutch role within it – by providing data on the total size of major European economies' merchant fleets over the 1470-1770 period.[7] Again, the picture is one of the substantial expansion of carrying capacity to support international commerce from around the time of Dutch independence, with that expansion being most pronounced in the Netherlands fleet itself. Further reinforcing

[7] (Maddison, 2003b) All Maddison data accessed via embedded StatLinks on 15 February 2011 at http://www.oecd-ilibrary.org/development/the-world-economy_9789264022621-en.

this understanding of trade growth throughout the Dutch Golden Age, figure 3 demonstrates that total European trade with Asia boomed during the 1500-1700 period – but just as importantly, it demonstrates that the Dutch went from bit players to leadership over the two centuries, at the expense of the Portuguese.[8] Given the role of Asian trade as a source of competition and diffusion of technological know-how that led to major strides in the sophistication and productivity of certain European manufacturing sectors, such as pottery and textiles, this fits well with the dissertation's theory.[9]

Figure 3. Number of Ships Departing for Asia by Country, per century, 1500-1700



Source: Maddison (2003). Data is for contemporary borders of states.

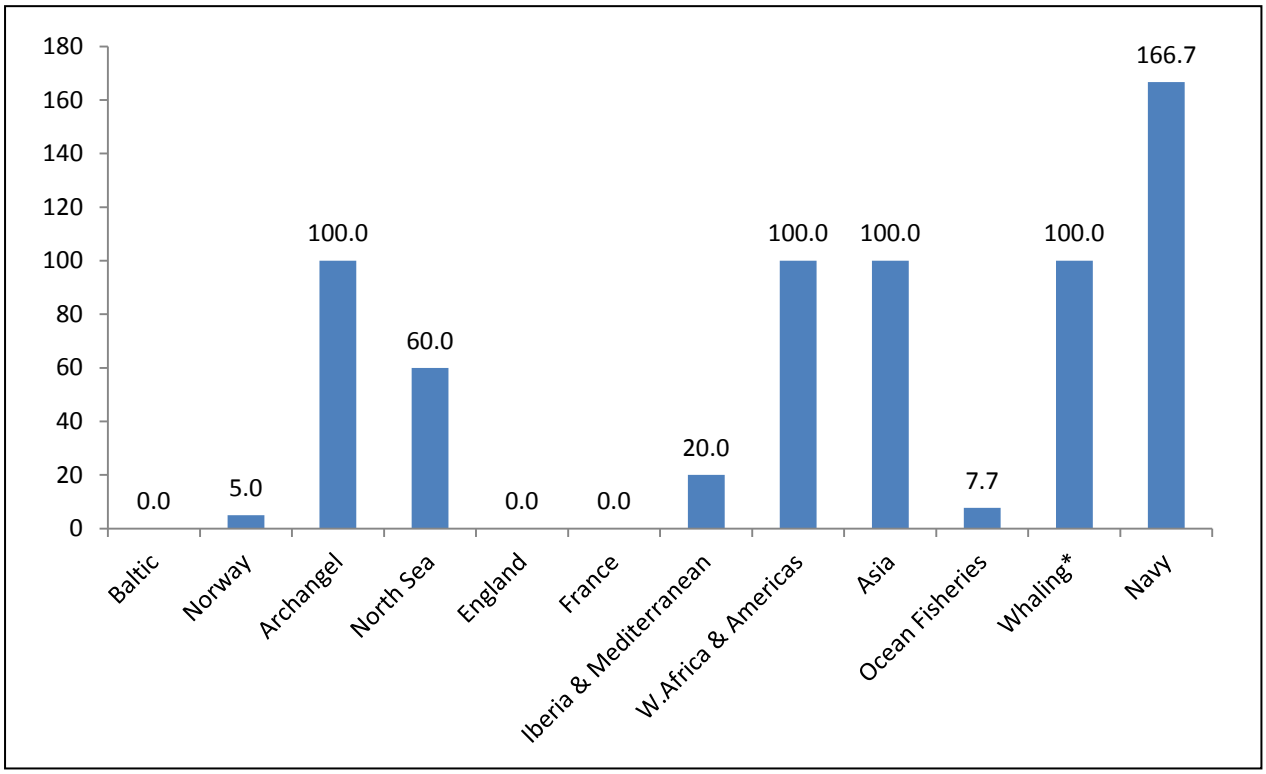
The growth in Dutch trade even during a comparatively short period within the early Golden Age is laid out by figure 4, which provides specific details on where growth in Dutch maritime trade occurred, organised by growth in the employment of sailors working routes

[8] (Maddison, 2003b)
[9] (Maddison, 2005, p. 59)

with geographic regions.[10] This chart makes clear that the key growth areas during this early part of the Golden Age were the long-range routes to Asia, Africa, the Americas, and the Far North (Archangel) – one of the earliest expansions of genuine *global*ization.[11] That said, as figure 5 makes clear, a lack of substantial growth in Dutch European trade between 1610 and 1640 belies the fact that the intra-European trade had already boomed.[12] Figure 6 gives a sense of the scale of this boom, by presenting data on the growth of one dimension of intra-European trade between 1591 and 1730 – that between the Netherlands and the Mediterranean.[13] This chart demonstrates that Dutch trade with Mediterranean economies expanded by more than 280 percent in the decade that followed the turn of the seventeenth century compared to the decade that preceded it. This figure is particularly significant when viewed in light of the Dutch catch-up and subsequent overtaking in terms of per capita development levels of the early modern Italian city-state economies depicted in figure 11 – a pattern consistent with the convergence-trade theory presented in Chapter II.[14] Similarly, while it does not show up in shipping data (due to territorial contiguity, which rendered movement by sea unnecessary) the commercial activity concentrated in Antwerp (in modern Belgium – again, see figure 11 for evidence of Belgian development levels) prior to the Dutch Revolt resulted in outflows of sophisticated manufactured and engineered goods throughout northern Europe, including the rest of the Low Countries.[15] Lastly, of course, the Dutch maintained and strengthened their position in Baltic trade.[16]

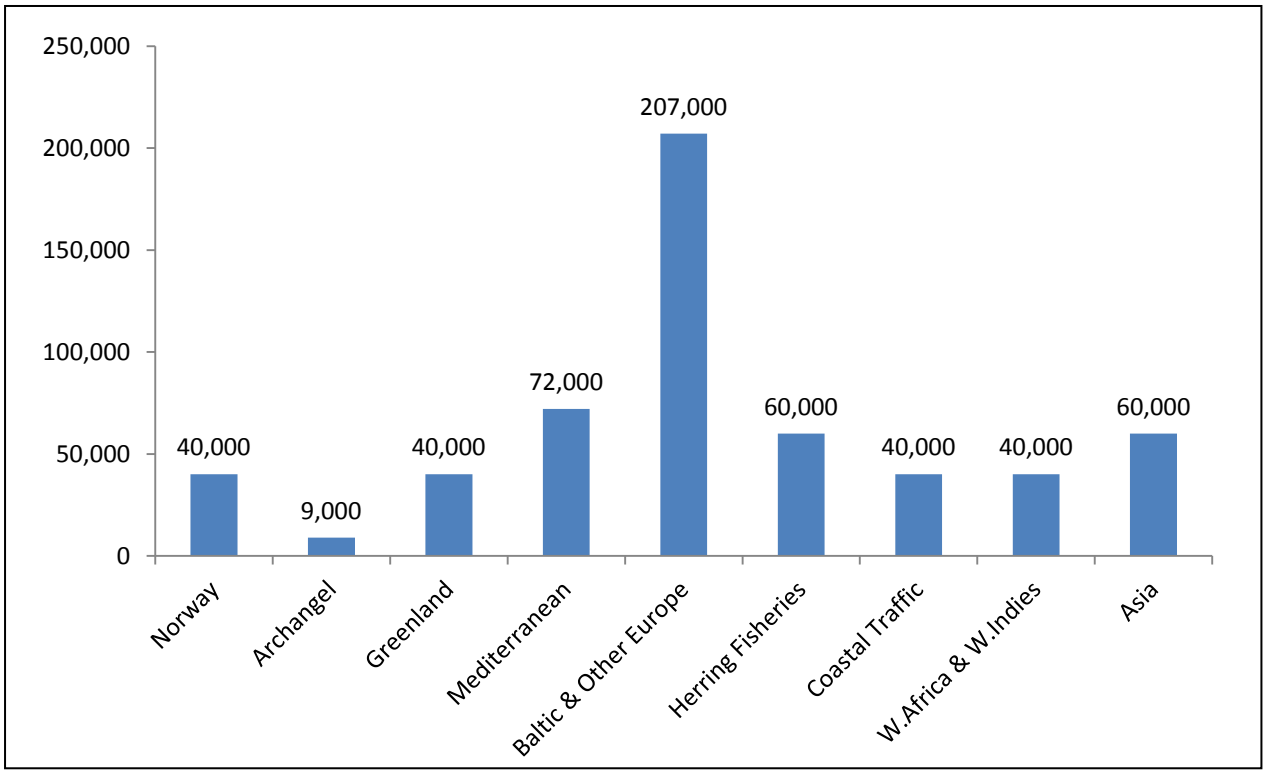
[10] (Maddison, 2003b)
[11] Although the use of the 'globalization' label in this context does merit certain qualifications: (de Vries, August 2010) Dutch trade with the Americas (including the slave trade) was more important than is often apparent, given the focus on Asia – the Dutch relationship with New York being one well-known exception: (Postma & Enthoven, 2003)
[12] (Maddison, 2003b)
[13] (de Vries & van der Woude, 1997, p. 381)
[14] (Maddison, 2003b)
[15] (Israel, 1995, pp. 271, 307)
[16] (Lindblad, 1993; van Tielhof, 2002)

Figure 4. Growth of Employment in Dutch Shipping by Area of Operation, %, 1610-1640



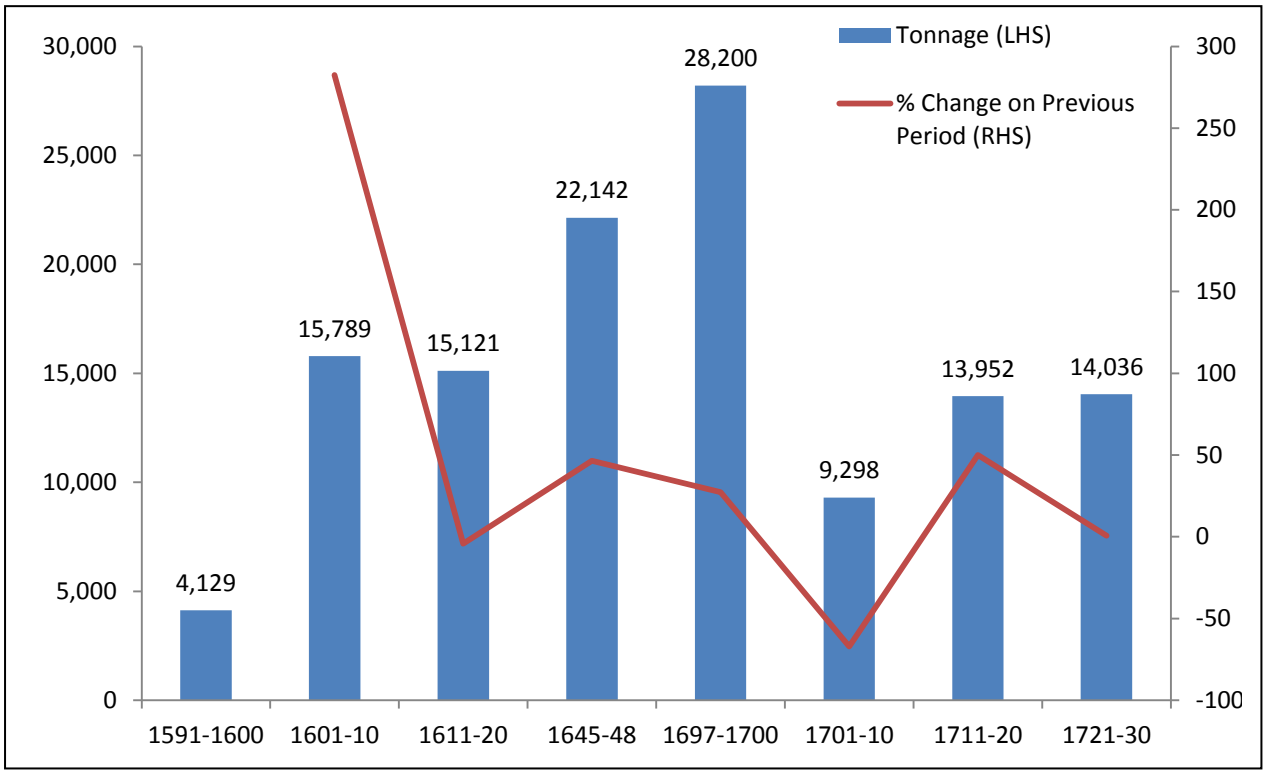
Source: Maddison (2003). *Whaling grew from a base of zero, so coded as a 100 percent expansion for illustrative purposes.

Figure 5. Dutch Merchant Shipping by Operating Area, tonnes, 1670



Source: Maddison (2003).

Figure 6. Dutch Merchant Shipping Departing for the Mediterranean, tonnes, 1591-1730



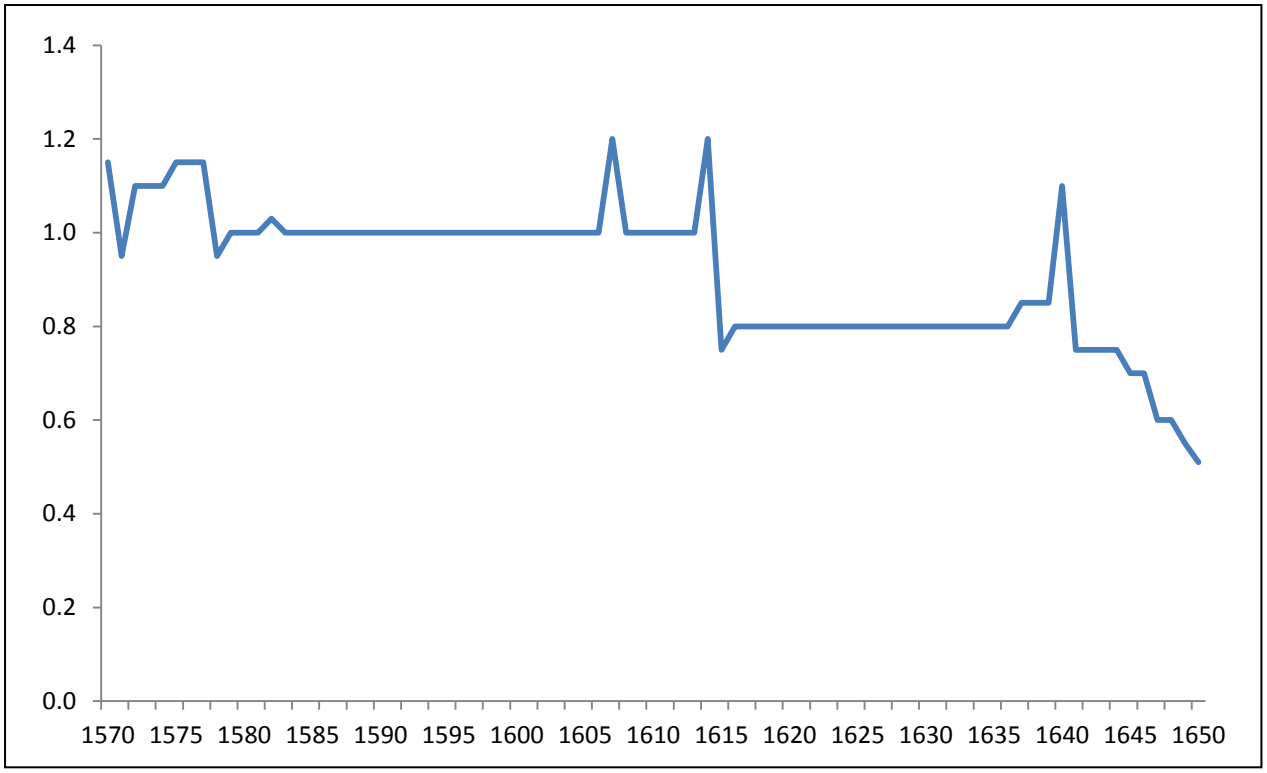
Source: de Vries and van der Woude (1997), p. 381.

Further evidence of international economic integration from during this period comes from the behaviour of key traded factor prices. The Amsterdam price of pepper – the principal bulk food import from Asia to Europe, sold by both the Dutch and English East India Companies – fell from an average of 1.15 guilders per pound in 1570 to an average of only 0.51 guilders per pound by 1650, as figure 7 makes clear.[17] Meanwhile, as figure 8 shows, the Amsterdam price of silver – a high-value commodity traded both within and beyond Europe – fell from an average of 19.2 guilders per gramme in 1550 to an average of only 9.8 guilders per gramme in 1650.[18] These two charts between them provide compelling evidence of an expansion of international trade across the value spectrum. Finally, it is also

[17] (van Zanden, 2005) All van Zenden data accessed online on 17 April 2012 at http://www.iisg.nl/hpw/brenv.php.
[18] (van Zanden, 2005)

worth noting that the rivers and waterways linking Holland and Germany were reopened in the 1580s, further facilitating Dutch intra-European trade.[19]

Figure 7. Dutch Pepper Price, guilders per pound (lb), 1570-1650



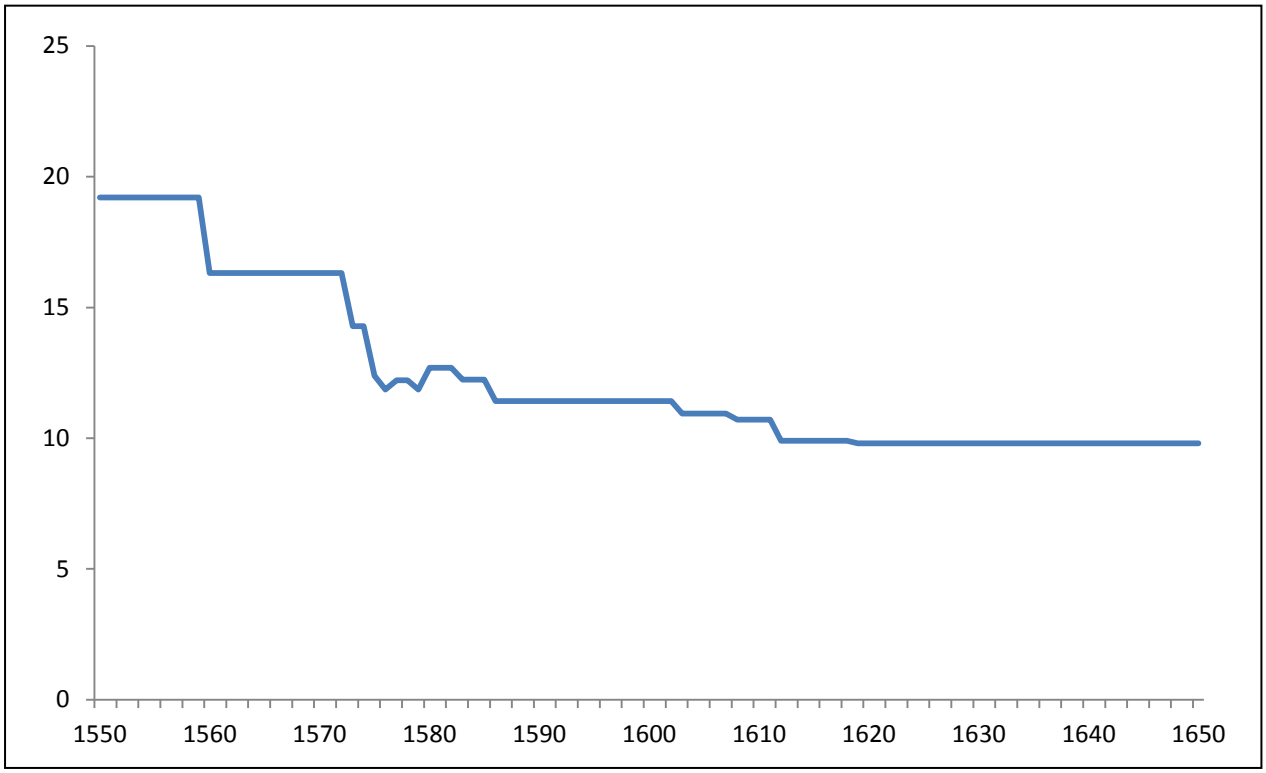
Source: van Zanden (2005). Annual average price in Amsterdam trading.

In short, the 1581-1674 period displays evidence of expanding international goods trade *along certain key metrics*. This is not to deny that the period was mercantilist, insofar as concerned states were seeking to target their trade for national ends and to the exclusion of others.[20] Nor is it to deny that there may have been significant intra-period cyclical shifts.[21] Nonetheless, in terms of the substance of what was actually going on at the time and how that relates to this dissertation's theory, the case is relevant. Dutch entry into the previously Portuguese (Asia) and English (northern Europe) dominated international trading system

[19] (Israel, 1995, p. 307)
[20] (Irwin, December 1991; Viner, October 1948)
[21] Thomas Lindblad, for instance, contends that Dutch trade boomed up until the 1640s, but then slumped again, before recovering from the 1680s – in contrast to what he sees as the 'textbook' view of steady growth until the 1650s followed by stagnation: (Lindblad, 1993)

resulted in an expansion of total trade volumes, enabling the Dutch to access foreign goods, the skills, resources and factor inputs that such goods embody, and the materials required for development.

Figure 8. Dutch Silver Price, guilders per gram, 1550-1650



Source: van Zanden (2005). Annual average price in Amsterdam trading

The Expansion of Financial Flows in the Dutch Golden Age

Financial flows from other countries played only a modest role in the Dutch rise; as noted at the outset of this chapter, and as will be discussed in more detail later, national-level innovations that yielded domestic investment – most notably, the Amsterdam stock and bond markets – were of prime importance on this front, channelling available savings.[22] Indeed, from comparatively early in its post-independence development trajectory, the Dutch Republic became a source of finance for other states – a point discussed in more detail below.

[22] Early Dutch social and political structures were well suited to the preservation of wealth and produced a high propensity to save: (Dehing & Hart, 1997, p. 37)

However, there are nonetheless some salient elements of the financial history of the period that do fit with the dissertation's wider theory.

First, as both Jonathan Israel and Angus Maddison observe – and as figure 11 illustrates in terms of per capita development – prior to the Dutch Revolt, Antwerp was the centre of commercial and financial activity in Northern Europe, while the Italian city states enjoyed a comparable role in Southern Europe.[23] Accordingly, following the internal stabilisation of the Dutch Republic once the instability of the Revolt was passed, there was a significant inflow of capital from investors in Antwerp and other financial centres.[24] In line with the economic theory presented in Chapter II, mobile capital – in the presence of an opening to international financial flows – chased profit in markets with sufficient development potential to yield high rewards to investment. And according to Israel, this in turn was a crucial source of financing for Dutch development during the early days of the Golden Age.

Second, from comparatively early in the Golden Age, Amsterdam was the *de facto* centre of banking functions for international financial transactions. Even by 1600, Amsterdam banks generated regular exchange rate quotations for ten other major commercial cities: Antwerp, Danzig, Frankfurt, Hamburg, Cologne, London, Nuremberg, Paris, Rouen, and Venice.[25] And by the time of the Seven Years' War (1756-1763) – long after Dutch decline had set in, and the Bank of England had itself taken on a major role in the international financial system – British subsidies to German states still proceeded via bills at Amsterdam.[26] This central role in the 'hub-and-spoke' financial system of the time in turn made Amsterdam banks a popular destination for foreigners' savings, which in turn bolstered those banks' ability to support Dutch merchant houses – although, with the passing of time,

[23] (Israel, 1995, p. 271; Maddison, 2005, p. 19)
[24] (Israel, 1995, pp. 307, 311-312; Spufford, 1995, pp. 303-323)
[25] (de Vries & van der Woude, 1997, p. 136)
[26] (de Vries & van der Woude, 1997, p. 136)

much of this financial dealing became disconnected from the 'real' Dutch economy of commerce, manufacturing, agriculture, and shipping, with subsequent implications for Dutch decline (discussed later).[27] Moreover, alongside these two elements of process tracing, there is a more basic congruence point to be made regarding the presence of deepening financial globalization and differential economic growth in the period.[28]

Labour Movement and Skill Transfer in the Dutch Golden Age

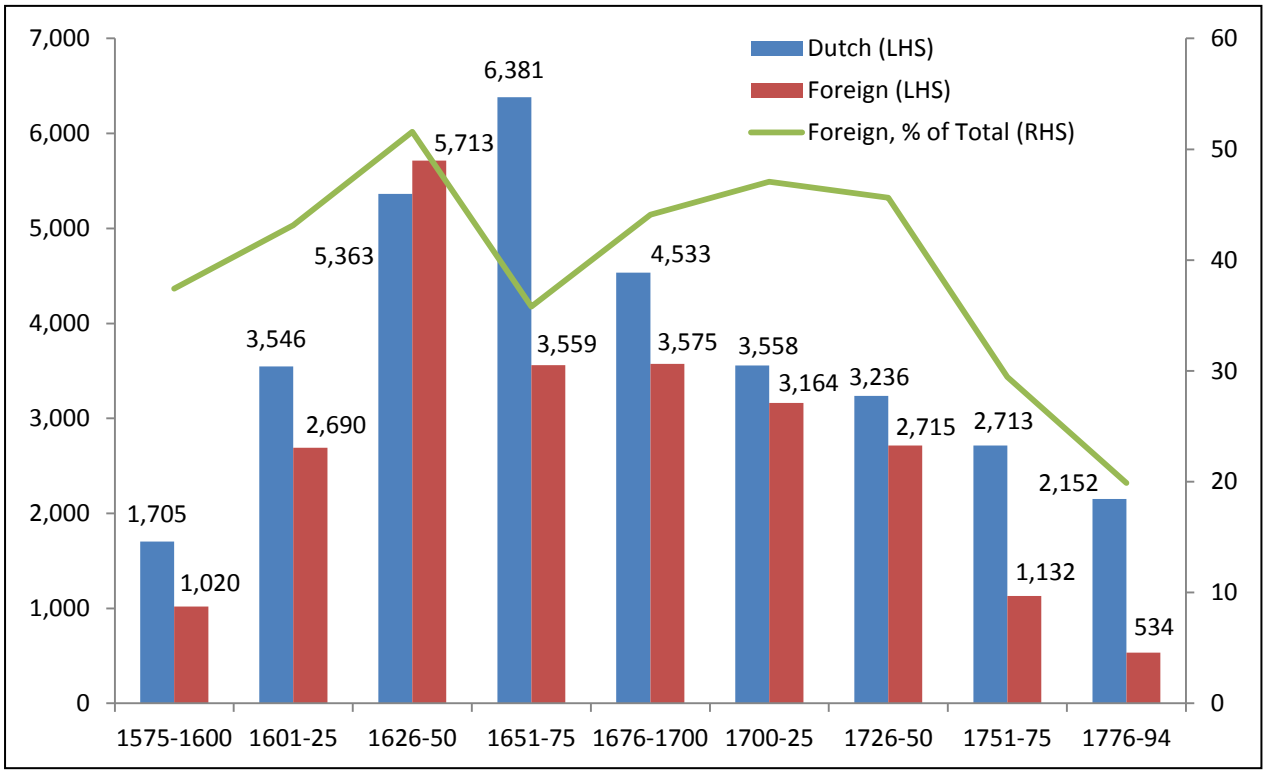
The final facet of international economic integration that expanded during the Dutch Golden Age was the movement of labour, skills, and human capital. Again, referring back to Israel's observations about the role of Antwerp as an immediate post-Revolt source of valuable inflows into the newly-independent Republic, the city was also a hub of engineering and manufacturing expertise; meanwhile, Liége – also in modern Belgium – was Europe's principal centre for iron production.[29] Such specialists – particularly ones attracted to the Netherlands' Protestant orientation – saw opportunities for a high return to their talents in the new state. An immediate consequence of this was the Dutch becoming Europe's undisputed leaders in terms of harbour, irrigation, sea defence and fortification construction by 1600.[30]

Moving from specific specialists bringing certain skills to aggregate patterns of human capital movement, throughout the early and middle stages of the Golden Age, the Republic was a magnet for skilled immigrants seeking higher rewards for their expertise – particularly Protestants.[31] Figure 9 provides data on a key indicator of the inflow of highly skilled workers: numbers of foreign students studying at the Netherlands' leading higher educational institution, Leiden University (founded in 1575).[32] As the chart makes clear,

[27] (de Vries & van der Woude, 1997, pp. 134-147)
[28] (Lothian, November 2002)
[29] On Liége, see (Gutmann, 1988, pp. 61-63)
[30] (Israel, 1995, pp. 271-275)
[31] (Davids, 1995, pp. 346-347; Lucassen, 1995, pp. 367-369; van Lottum, 2007, pp. 14-15)
[32] (Israel, 1995, p. 901)

Leiden was a draw for international students throughout its early history, but the growth of the non-domestic student cohort was at its most impressive between the university's foundation and 1650. Insofar as openness to cross-border human capital diffusion is a principal dimension of this dissertation's theory regarding the potential growth-promoting effects of international economic integration, therefore, this data is particularly salient.

Figure 9. New Student Enrolments at Leiden University, per quarter century, 1575-1794



Source: Israel (1998), p. 901.

Figure 10 turns to consider a more general indicator of international labour movement, presenting data on the geographical provenance of new citizens recorded at Amsterdam for two five-year snapshots: 1590-1594 and 1655-1659.[33] The former represents a window of time from the earliest years of the Golden Age, while the latter presents a view of the Republic at its zenith.[34] While time series data for the years preceding, following, and

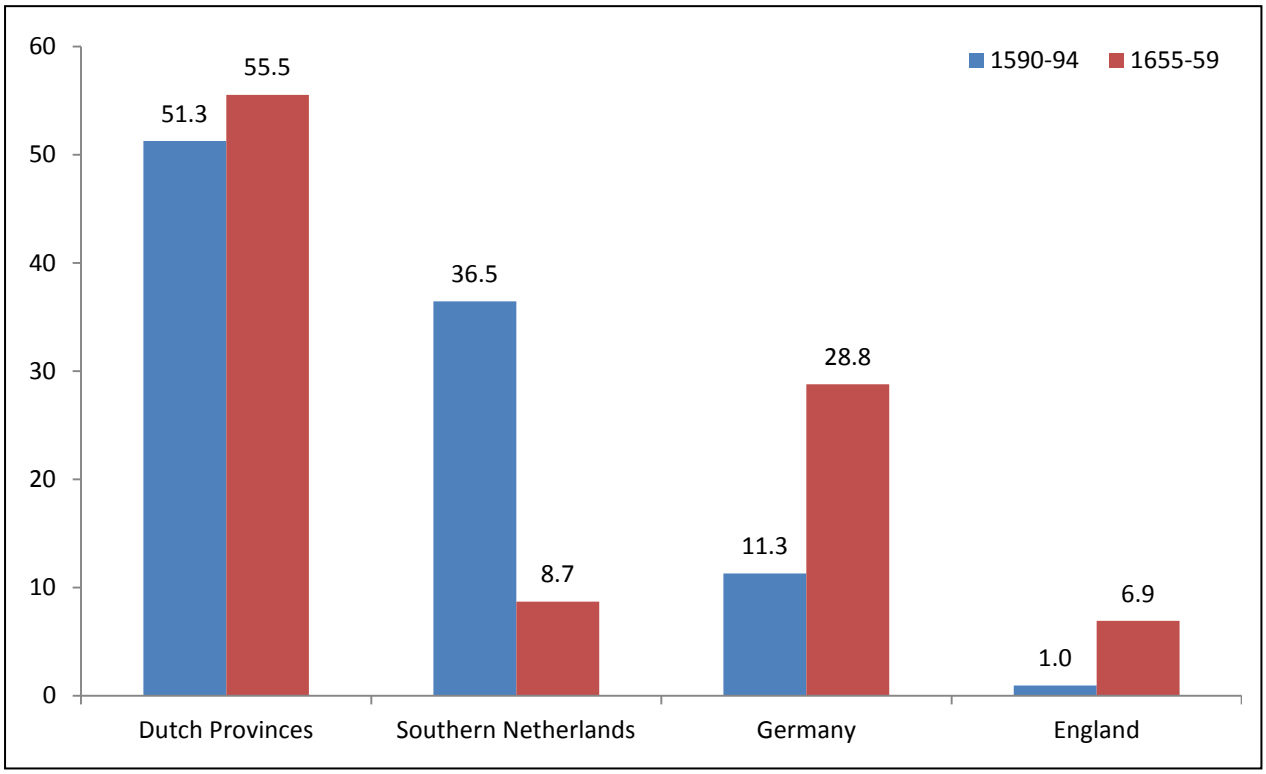
[33] (Israel, 1995, p. 330) On Amsterdam's particular role as a hub of information exchange, see (Lesger, 2006, pp. 259-261)
[34] (Israel, 1995, p. 700)

between these two periods is not available, this chart suggests that the Republic attracted labour from abroad throughout the Golden Age, but that the composition of the inflows evolved over time. In the early period, the single biggest source of new foreign citizens at Amsterdam was the Southern Netherlands – that is, the area roughly comprised by modern Belgium – bearing out the story told above about influxes from Antwerp and its region. Indeed, the population of Antwerp – which stood at 84,000 in 1583 – had fallen to 42,000 by 1589, as its inhabitants fled the remaining Habsburg Netherlands for the freedom and rewards of the newly-independent state to the north; the population of Ghent similarly halved.[35] In the latter period, however, German and English nationals represented a more sizeable proportion of the total flow of people to the Dutch metropolis. The unifying feature across both periods therefore seems to be that the flow of people from abroad constituted a flow of human capital, with each new influx generally bringing a valuable skill set that contributed to the economy of the Republic.

In summary, the Golden Age of Dutch development under consideration for its strategic impact on the European balance of power in the first half of chapter – that is, the period between independence in 1581 and the end of the third Anglo-Dutch War in 1674 – cannot be characterised as a liberal international market economy comparable to the 1870-1914 period or the contemporary era. But it certainly displays substantive traits that this dissertation's theory associates with deepening economic integration. Below, the chapter turns to an analysis of the impact that this economic openness – such as it was – had on major powers' growth trajectories, with a focus on the ascent of the Dutch Republic.

[35] (Israel, 1995, p. 308)

Figure 10. Provenance of New Citizens at Amsterdam, %, 1590-1659



Source: Israel (1998), p. 330.

The Growth Outcomes of International Economic Exchange in the Dutch Golden Age

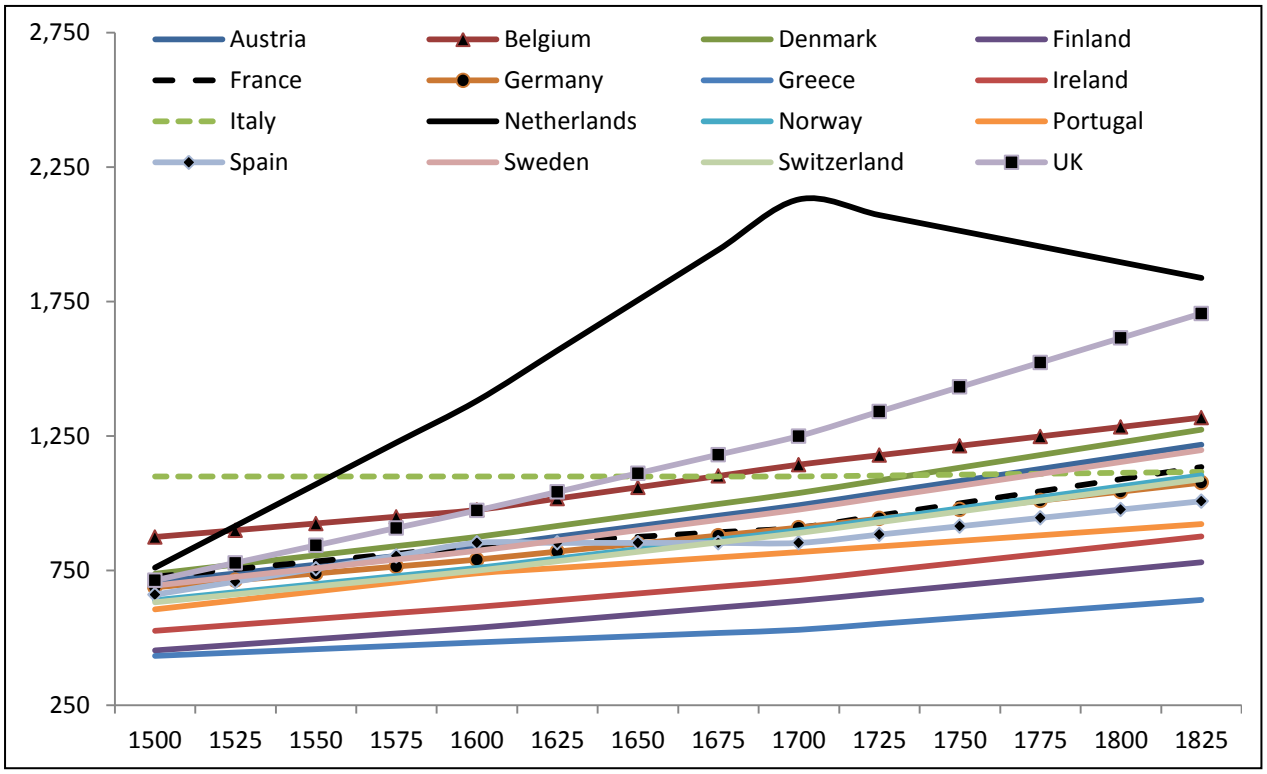
As noted at the outset of this chapter and as will be discussed in greater detail later, Dutch economic growth in the Golden Age owed a substantial debt to domestic factors. However, the international factors detailed above also played a role. This section details the Dutch economic rise – thereby filling a congruence testing role – and, where possible, attempts to explain the role that international exchange played in that rise, thereby achieving a process tracing assessment.

Figure 11 starts by putting the Dutch economic growth experience in European perspective (note that the data in this chart uses the contemporary borders of the various countries, meaning that there will be some variation between the economic development levels of states in the sixteenth to eighteenth centuries and the details provided here).[36] Straight away, it becomes apparent that the Netherlands experienced catch-up growth in the

[36] (Maddison, 2003b)

sixteenth century – and while its per capita GDP level became world-leading by around the middle of the century, it probably continued to reap catch-up gains from the most developed city-regions and city-states of the previously leading economies for some time longer. In practical terms, that means the Antwerp region of what is now modern Belgium, as discussed above, and Venice and Florence in what is now modern Italy (which, as a remarkable aside, experienced GDP per capita growth of only $17 in 325 years; the Dutch figure, for comparison, was $1,077). The discussion above about the particular significance of Antwerp as a source of high-end goods trade, capital, and skills in the immediate aftermath of Dutch independence would support this assessment, as would figure 6 on the significance of the Mediterranean trade.

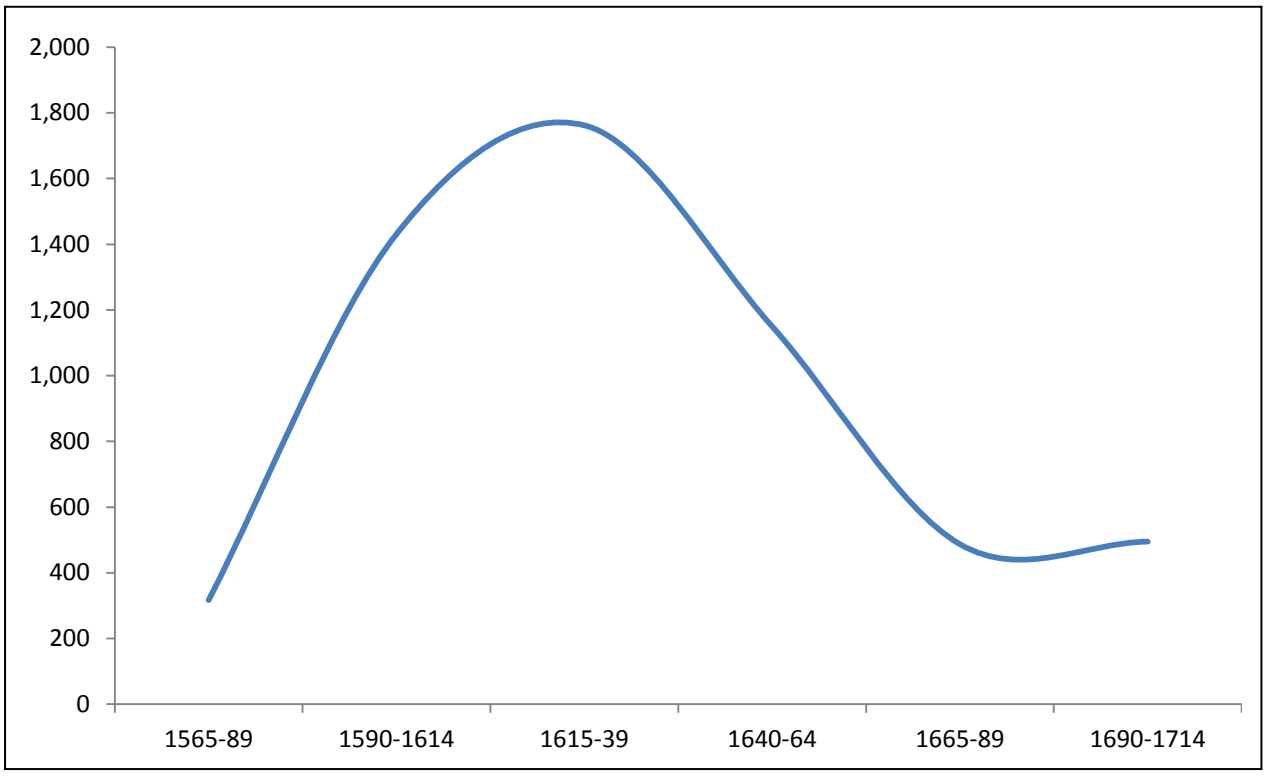
Figure 11. GDP per Capita of European Economies, 1990 US$, 1500-1825



Source: Maddison (2003). Data is for contemporary borders of states; hence the 'Germany,' 'UK,' and 'Italy' figures, for example, would actually be shared by the various states that then constituted what became modern Germany, the United Kingdom, Italy, and so forth. Data for years other than 1500, 1600, 1700 and 1820 generated by interpolation.

Nonetheless, what is also clear is that by the end of the sixteenth century, the Dutch Republic was the most developed state in Europe and continued to widen its lead for the next hundred years; like the United States in the 1870-1914 period (see Chapter VI), it not only experienced catch-up growth, but then went on to comfortably outstrip the previously most developed economies. Accordingly, as noted throughout, this section recognises that growth cannot solely be attributed to international convergence processes and had a major domestic component – but equally, as the discussion below will demonstrate, the international transfer mechanism was also relevant.

Figure 12. Reclamation of Land from the Sea in the Dutch Republic, hectares, 1565-1714



Source: Israel (1998), p. 335.

First, to consider evidence of Dutch state consolidation and early pre-industrial development with certain industrial characteristics,[37] figure 12 presents data on the area of land reclaimed from being unusably waterlogged – that is, territory that was permanently or

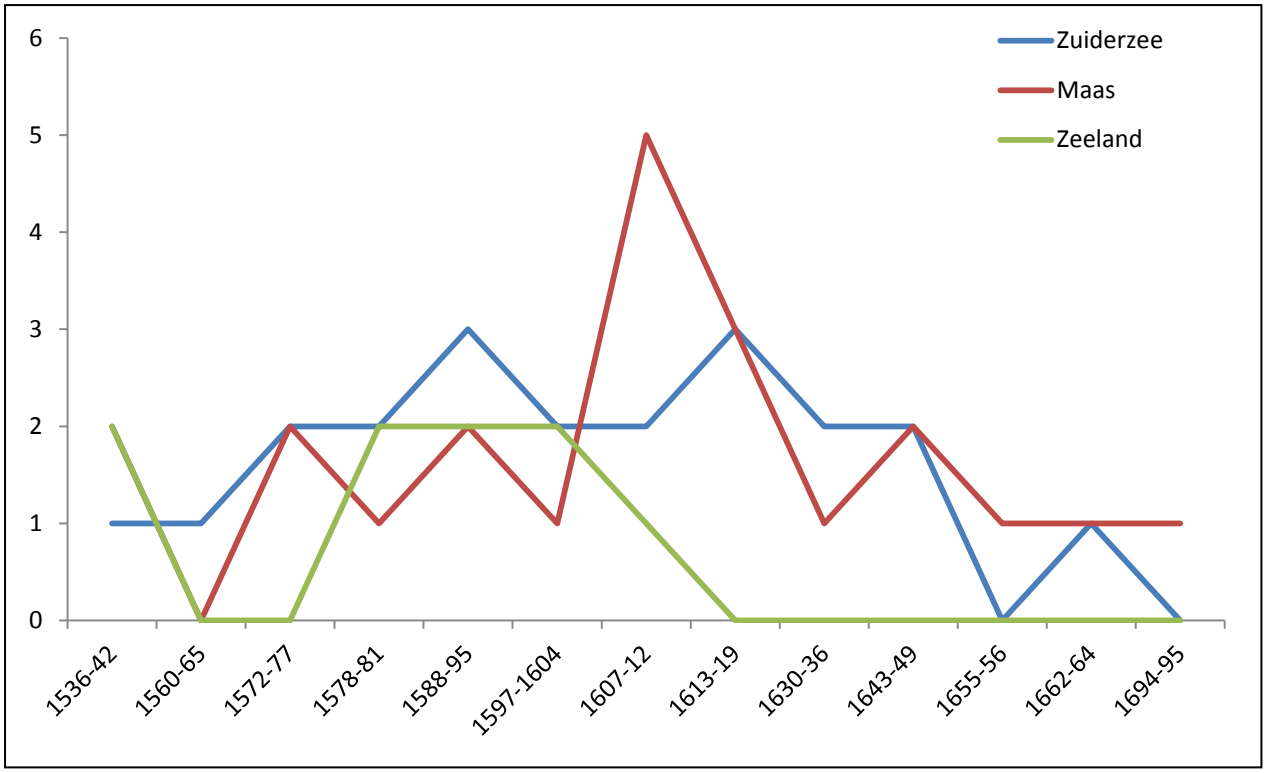
[37] (de Vries, October 2000)

periodically flooded by the sea and/or rivers – to become useably dry, via the construction of dikes, dams, and irrigation systems.[38] As the chart makes clear, in the late sixteenth and early seventeenth centuries, the Republic engaged in a concerted program of infrastructural development aimed at expanding its land mass available for agriculture, manufacturing, and habitation, peaking at an impressive 17.62 million square metres reclaimed in the 1615-1639 period. How may the international economic flows described above have contributed to such development? The most obvious relevant mechanism is the transfer of advanced engineering expertise from Antwerp. On top of that, the finance available to Dutch banks, the wealth generated by Dutch trading houses – which also created demand for a clearer distinction between useably dry land and navigably deep water, rather than shallow waterlogged areas useable for neither – and an influx of skilled labour likely played a role.

Second, albeit in a similar vein, figure 13 presents data on another variety of infrastructural development: construction of new harbour facilities within three major Dutch port areas.[39] As this chart again makes clear, the late sixteenth and early seventeenth centuries were characterised by substantial efforts to boost the Republic's productive capacity – this one in particular operating in a very clear endogenous supply-and-demand relationship with the expansion of Dutch maritime commerce. At the peak of Dutch harbour construction – 1607-1612 – eight new harbour facilities were constructed in only a six-year period across these three port areas alone. How may the international economic flows described above have contributed to such development? Again, the most obvious relevant mechanism is the transfer of advanced engineering expertise from Antwerp. And again, the finance available to Dutch banks, the wealth generated by Dutch trading houses – clear drivers of port capacity demand in this case – and an influx of skilled labour also likely contributed.

[38] (Israel, 1995, p. 335)
[39] (de Vries & van der Woude, 1997, p. 34)

Figure 13. Number of New Harbours Constructed in Three Dutch Port Areas, 1536-1695



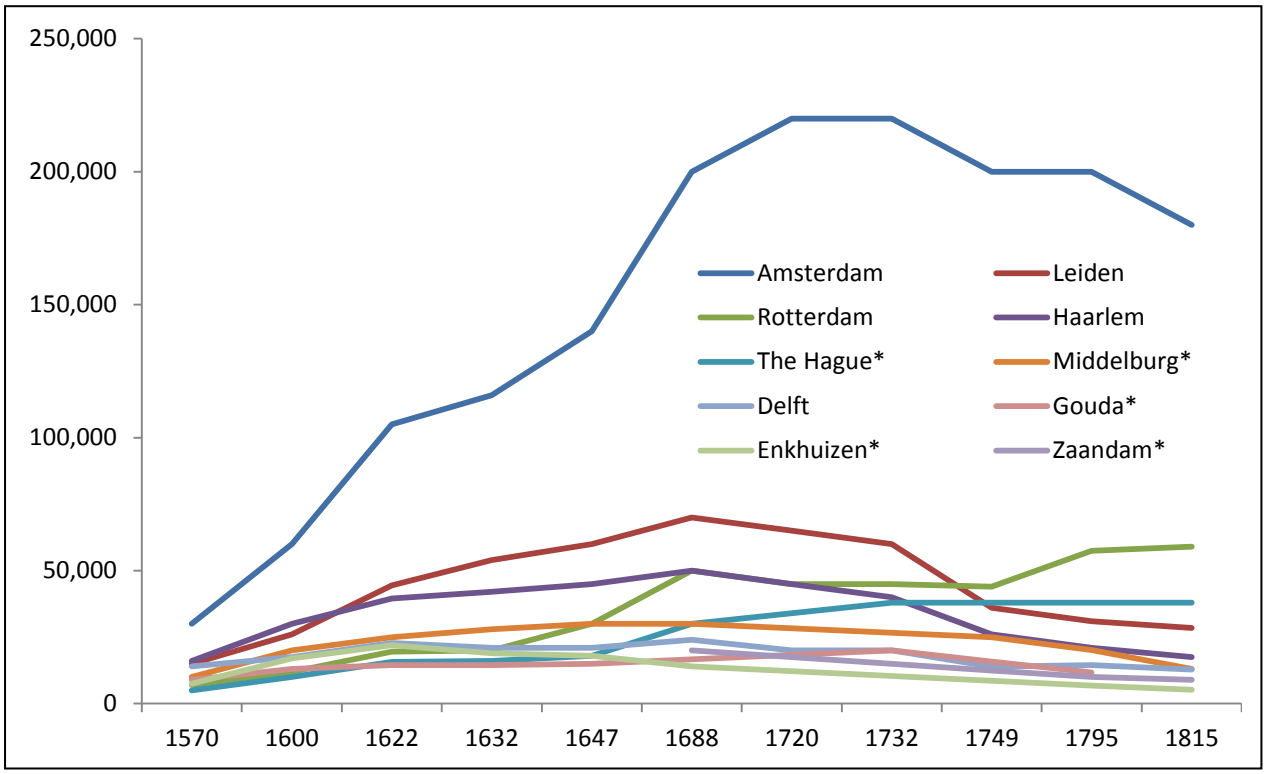
Source: de Vries and van der Woude (1997), p. 34.

The spectacular growth of the Republic's maritime and manufacturing urban centres from just before independence to the zenith of the Dutch Golden Age in the late seventeenth century is made clear in figure 14; Amsterdam, in particular, grew in population by more than seven-fold between 1570 and 1720.[40] Such urbanisation is of course a symptom of national economic development, given the attraction of lucrative employment that draws rural people into cities. By the late seventeenth century, it is estimated (admittedly very roughly) that only one-third of the population of the Netherlands was employed in agriculture – an unprecedentedly low proportion – with the rest having shifted to higher-productivity sectors.[41] But it is also a cause of national economic development – and insofar as the wealth generated by the major Dutch cities, most notably Amsterdam, owed to the growth of

[40] (Israel, 1995, pp. 329, 1007) Note that the subsequent decline of urban populations is discussed separately later in the chapter.
[41] (Gutmann, 1988, p. 119)

international trade, international finance, and the influx of skilled labour, international economic exchange undoubtedly contributed to Dutch growth via this mechanism also.

Figure 14. Urban Population of Major Dutch Maritime and Industrial Cities, 1570-1815



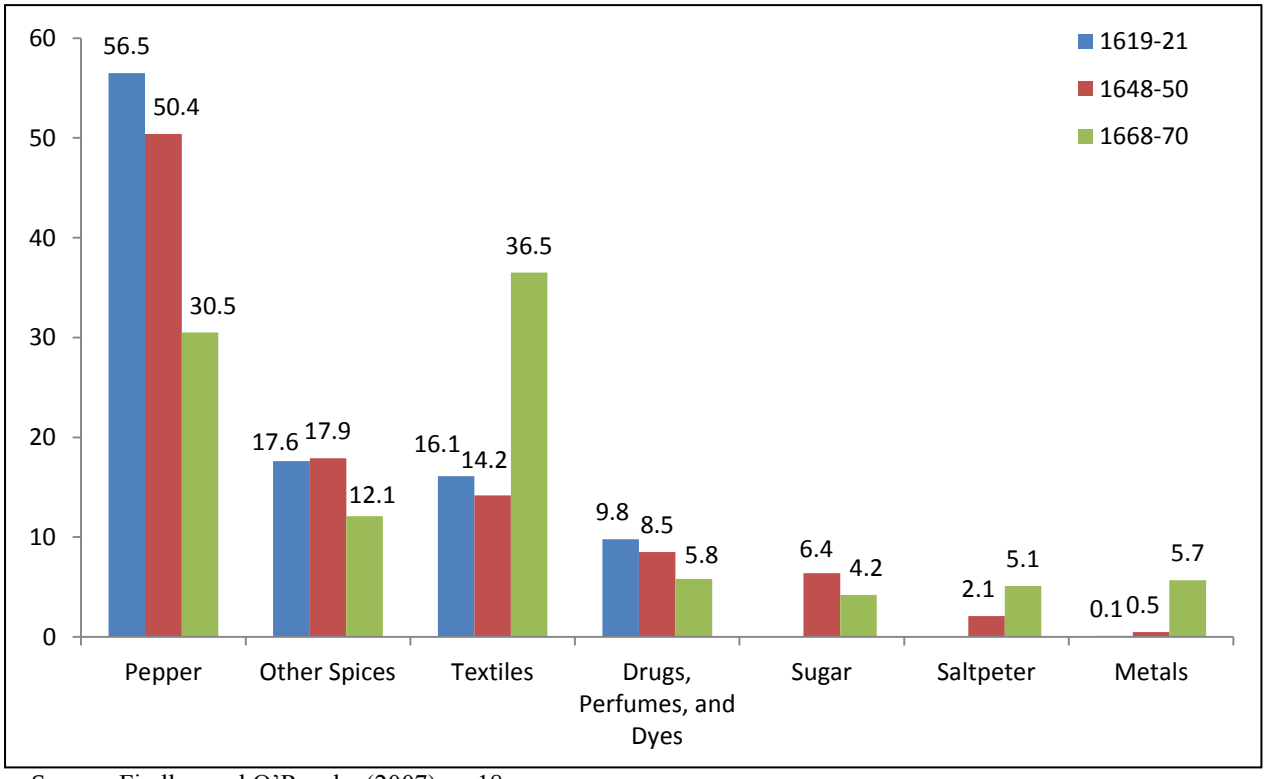
Source: Israel (1998), p. 329, p. 1007. *Denotes a city for which one or more data points was generated by interpolation, due to gaps in the available time series.

Figure 15 turns to consider the composition by value of Dutch East India Company (the *Vereenigde Oost-Indische Compagnie*; hereafter, '*VOC*') imports by type of goods, as a way to shed further light on the mechanisms by which international commerce contributed to the Netherlands' impressive growth during the Golden Age.[42] As the chart makes clear, bulk foodstuffs – pepper, other spices, and sugar – declined from constituting 74.1 percent of imports in 1619-1621 to represent only 46.8 percent in 1668-1670; negative growth of 36.8 percent. By contrast, 'industrial' inputs – those most relevant for the high-value manufacturing trades, notably textiles, drugs, dyes, perfumes, saltpetre, and metals – grew

[42] (Findlay & O'Rourke, 2007a, p. 18)

from constituting only 26.0 percent of the import basket in 1619-1621 to represent 53.1 percent in 1668-1670; positive growth of 104.2 percent. Such a shift towards imports of manufacturing inputs and the commensurate move up the economic value chain undoubtedly contributed to the Netherlands' impressive economic growth during the Golden Age. Indeed, while Asia was feasible as a target of colonisation because of the superiority of European weapons by the seventeenth century, it is important to recall that as of 1500, Asia still accounted for more than 60 percent of world GDP.[43] This is a clear indication of Asian economic strength in higher-value sectors at that time, and thus of the knowledge and other gains available via trade with the Far East.[44]

Figure 15. Composition of Dutch East India Company (*VOC*) Imports to Europe by Invoice Value, %, 1619-1670

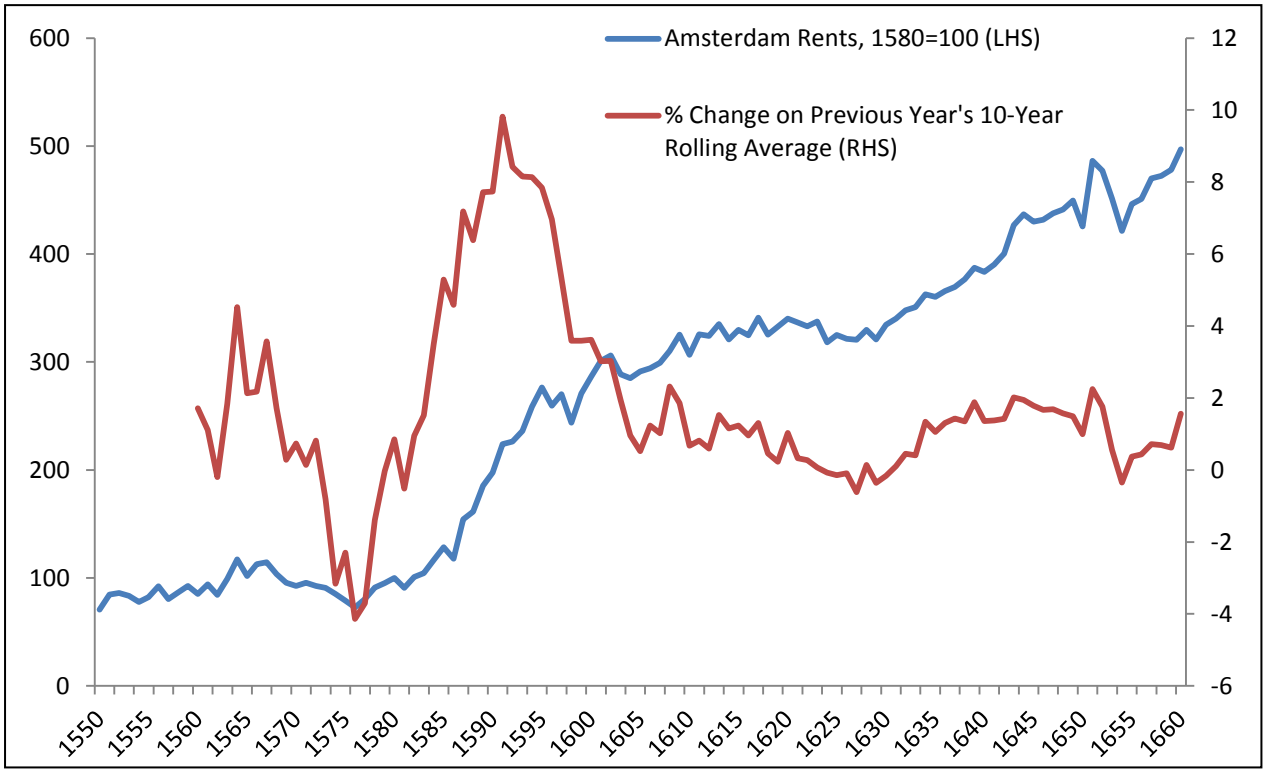


Source: Findlay and O'Rourke (2007), p. 18.

[43] See figure 35, Chapter VII.
[44] (Maddison, 2005, p. 59)

Of course, demand for such industrial inputs is itself a symptom of economic development. Yet in the absence of an expansion of such international trade – as evidenced by figures 1-5, 7, and 8, as well as figure 15 itself – the Dutch economy would have struggled to move up the value chain in the manner displayed in figure 15. Accordingly, even while it would be fallacious to look solely at the supply side without considering the expansion of domestic demand, it would also be fallacious to attribute full causation to the demand side without consideration of international supply.

Figure 16. Amsterdam Average Rents, indexed 1580=100, 1550-1660

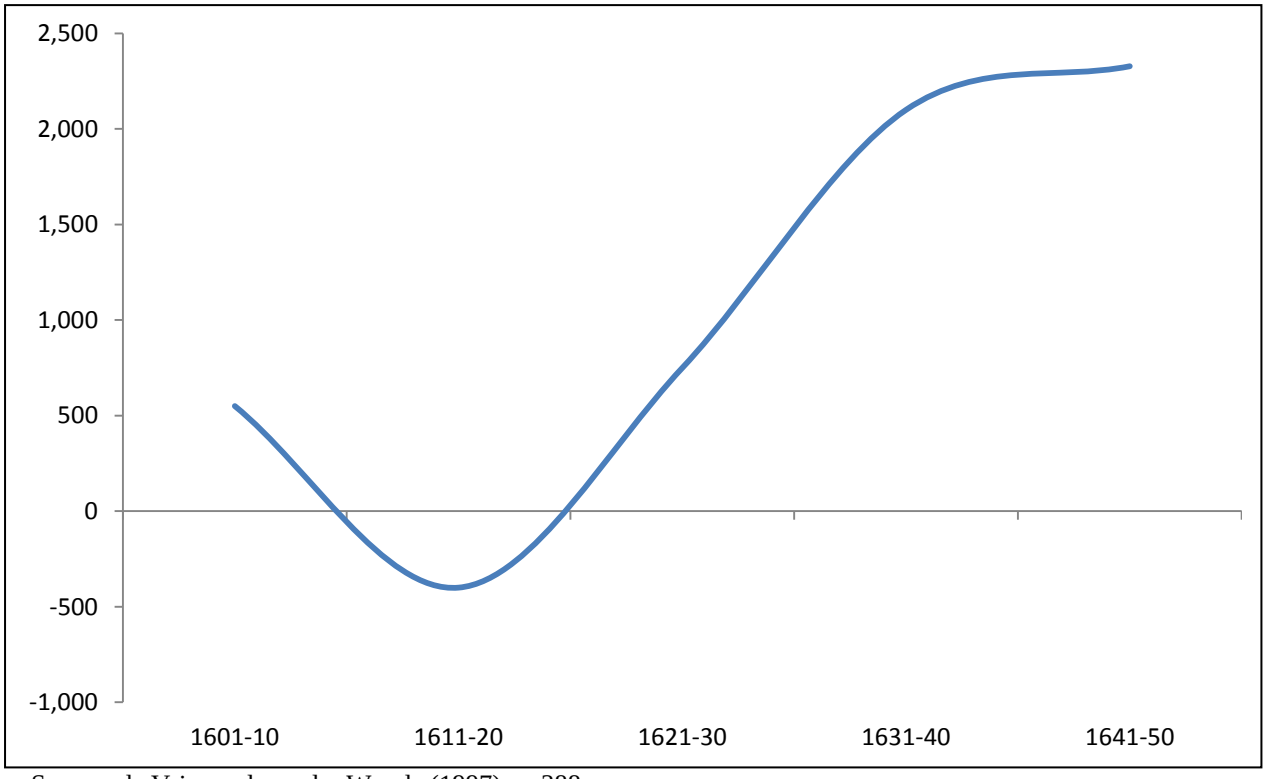


Source: van Zanden (2005).

In terms of garnering a perspective on the state of aggregate demand in the Republic, which in turn gives a sense of the economy's overall pace of growth, figure 16 is instructive. The chart makes clear that the years between independence in 1581 and the start of the seventeenth century witnessed a spectacular boom in demand for Amsterdam real estate, before settling back to a more sustainable growth rate for the remainder of the period from

the early seventeenth century through to the beginnings of the end of the Golden Age.[45] The timing of the property boom correlates strongly with the previously-documented expansion of Dutch international trade, the beginnings of Amsterdam's role as Europe's pre-eminent international financial centre, and in particular the major influxes of skilled labour from the still-Habsburg Southern Netherlands that all characterised the final two decades of the sixteenth century. Accordingly, there is a strong case that these international economic factors played a significant role in driving the expansion of real estate demand in the first twenty years of Dutch independence, before the economy settled to a more sustainable trajectory of property demand growth in subsequent years.

Figure 17. Profitability of the Dutch East India Company (*VOC*), revenue minus equipage, thousands of guilders per year, 1601-1650



Source: de Vries and van der Woude (1997), p. 388.

[45] (van Zanden, 2005)

To consider one final data point within this section – the profitability of Dutch international trade – figure 17 presents evidence on *VOC* pre-dividend profits over the 1601-1650 period.[46] As the chart makes clear, 1611-1620 saw the Dutch East India Company post a net loss as a consequence of substantial capital investment. This dip notwithstanding, however – and indeed, probably as a subsequent consequence of 1611-1620's major equipment spending programme – the *VOC* was increasingly profitable over the first half of the seventeenth century. Of course, a key source of its profitability was its steady displacement of rival national monopolies – principally that of Portugal – on lucrative routes, so this is not some unambiguous victory for a liberal international economic order. Nonetheless, it is indicative of the economic rewards that the Dutch Republic received from its involvement in international trade, such as it was, during this period.

In summary, while domestic factors were of pivotal importance in explaining the Dutch Republic's absolute and relative economic rise during the 1581 to 1674 period, international economic engagement contributed too. From a congruence testing perspective, the preceding discussion demonstrates that the expansion of international economic exchange during the Golden Age, and the integration of the Dutch into the hitherto Portuguese and English-dominated international commercial order, correlated with economic growth rates favourable to the Netherlands. And from a process tracing perspective, the analysis of international economic exchange's impact on Dutch growth demonstrates that expanded trade, international financial transactions, and human capital movement contributed, first, to the newly-independent Republic enjoying catch-up growth vis-à-vis the likes of Antwerp and Venice and, second, to the widening of its development lead once it had surpassed these previous economic leaders. To further reinforce this point, the history of the period provides a ready-made counterfactual study: the (re-)imposition of a Spanish embargo on Dutch trade in

[46] (de Vries & van der Woude, 1997, p. 388)

April 1621, and the subsequent temporary contraction of international commerce, resulted in one of the most significant setbacks to economic development during the first hundred years of the Republic's independence.[47]

In short, this section has demonstrated that the first key component of this dissertation's theoretical mechanism – deepening international economic integration leading to differential economic growth – was active, albeit with significant caveats and qualifications still to be discussed, during the early and middle Golden Age of the Dutch Republic. The next section will assess the impact that this differential growth had on the Netherlands' power position, the wider European balance of power, and the strategic consequences of these relative shifts.

The Balance of Power and Strategic Consequences in the Dutch Golden Age, 1581-1674

The previous section demonstrated that elements of international economic exchange during the Dutch Golden Age contributed to the Netherlands' impressive economic growth during the 1581-1674 period. This section sets out to first consider the impact that this differential growth had on the European balance of military power, before turning to an analysis of the consequences of shifts in the balance of power for international conflict in the period.

Shifts in the Balance of Power during the Dutch Golden Age

Figure 18 presents data on the size of the European major powers' armies between the 1470s and 1670s.[48] This chart displays some consistency with the dissertation's theory, but merits qualification on other dimensions. First, it supports the intuition that economic expansion enabled an expansion of the Dutch army over time. Second, it supports the

[47] (Israel, 1995, p. 478)
[48] (Maddison, 2003b)

intuition that Habsburg Spain – Europe's foremost military power at the start of the Golden Age – was unable to sustain its relative military position once its relative economic base was eroded. Indeed, the Netherlands was fielding one of the Western European international system's two largest armies by the 1670s – an impressive feat for such a small country in terms of both population and territorial area relative to its major power rivals. The Netherlands' vast lead in terms of per capita wealth – and the disposable financial wherewithal available to the Republic for strategic ends that this provided – along with the country's institutional and organisational capacity for mobilisation undoubtedly explains this ability to field an army that, as a percentage of population, was larger than that of all rival European major powers for much of the seventeenth century (see figure 19).[49] Straight away, therefore, we see that the Republic's economic rise played a substantial causal role in its military rise and contributed to a wider shift in the balance of regional power, insofar as a new great power entered the European international system.

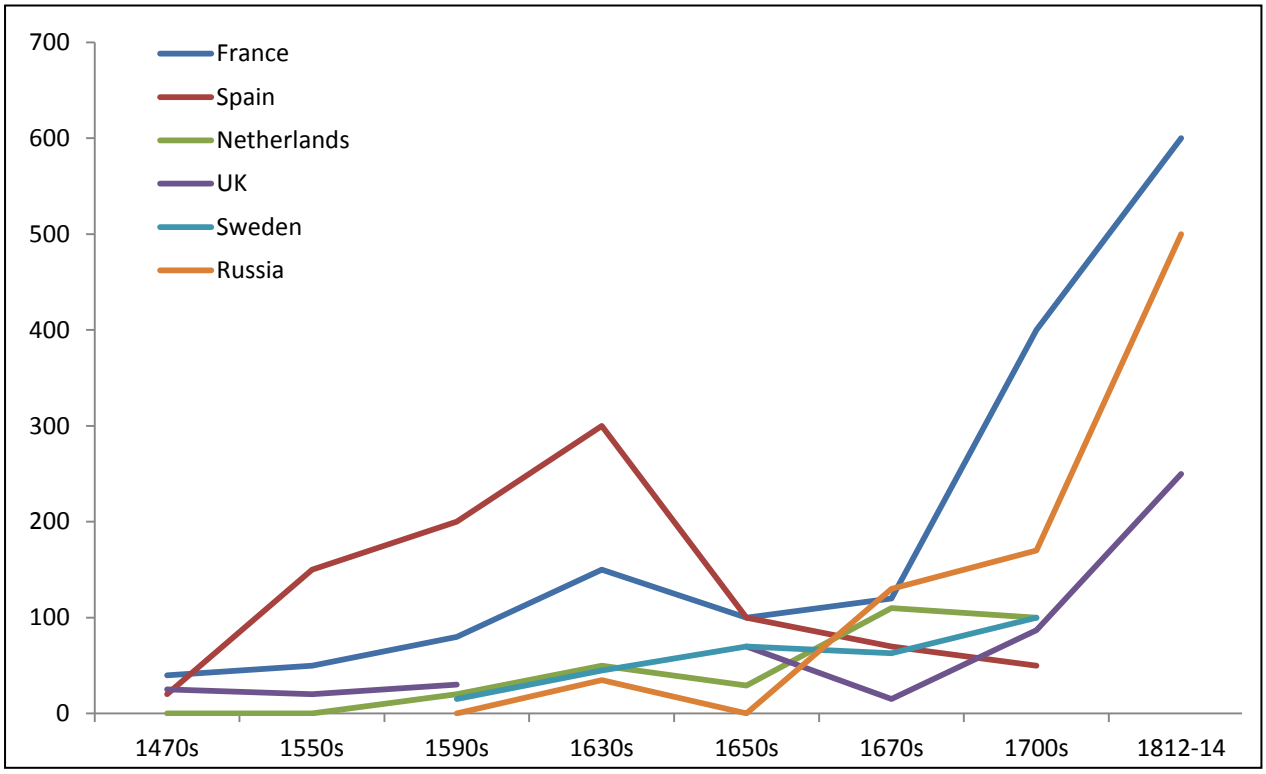
At the same time, however, the chart also makes clear that for the majority of the early and middle Dutch Golden Age, the Republic was *not* fielding an army that – in terms of raw numbers – ought to have been capable of rivalling those of Europe's larger states, most notably Spain and France. Indeed, in the 1650s – around the Republic's zenith, according to Israel – its army was actually smaller than those of Sweden and England, as well as France and Spain.[50]

Accordingly, to fully appreciate the impact of the Netherlands' economic rise on the European balance of power, we need an understanding not just of how Dutch development enabled the Republic to field an increasingly large army (particularly for the size of country), but also of how development enabled qualitative force improvements. On this front, there is

[49] (Tilly, 1992, p. 79)
[50] Spain and France, of course, also had much larger home territories and imperial possessions to police and protect – along with limited infrastructural development – reducing their ability to concentrate forces in space and time, which means that the local balance between the Netherlands and its rivals was probably more equal. Figures 23 and 25 – discussed below – support that intuition.

ample evidence to suggest that development-enabled innovations in the Dutch armed forces contributed to the Republic's rapid improvements in its relative strategic standing. To be sure, there was a broader 'revolution in military affairs' beginning in Renaissance Italy and spreading through Europe around the late sixteenth and early seventeenth centuries.[51] However, particular aspects of the Dutch experience served to deliver relative advantage to the Republic.

Figure 18. Size of Major Powers' Armies, thousands of personnel, 1470-1670



Source: Maddison (2003).

First, as noted earlier, an influx of engineering talent from the Southern Netherlands in the early years of Dutch independence made the Republic into the world leaders when it came to large, sophisticated, and effective defensive fortifications – a clear military

[51] (Israel, 1995, p. 267) For some notes of qualification on how 'revolutionary' these changes were, and for some disagreement on precise timings (albeit a perspective that still judges the Dutch reforms to have been of major strategic significance on the European balance of power), see (Parker, June 1976)

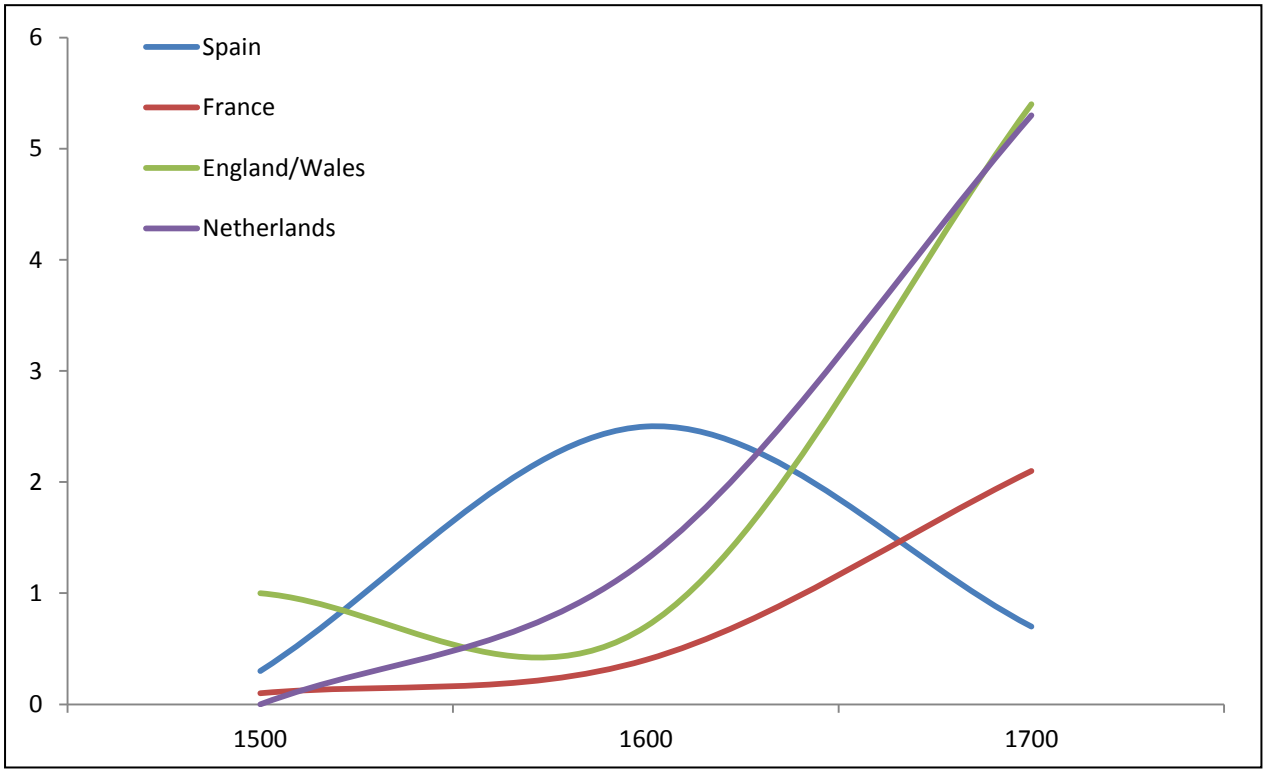
consequence of international human capital movement.[52] Such fortification, in turn, acts as a force multiplier for a given army size, since it enables a smaller relative number of personnel to hold a strong defensive position and frees other personnel for mobile operations. Second, the increasing financial wherewithal and administrative capacity of the Republic enabled it to support a particularly sophisticated logistical network, again multiplying the amount of combat power that could be generated by a given number of personnel.[53] Third, the presence of fixed garrisons within a relatively small – but economically and administratively developed – state resulted in the Dutch army reaching new standards for military discipline and professionalism.[54] The rape and pillage that was often part of standard operating procedure for armies of the time was met with zero tolerance in the forces of the newly-independent Republic – often meaning the death sentence for offending troops – in a bid to protect the civic society of the towns whose commerce was often funding the local garrison.[55]

Fourth, the Republic's financial wherewithal enabled the equipping of the Dutch army with military materiel that was both of the highest manufacturing quality and – crucially – standardised across deployed forces, thereby rationalising at a stroke the hitherto *ad hoc* logistical system for the supply of ammunition, spares, uniforms, and so forth.[56] Fifth, and following from this, new standards for equipment provision – along with the proliferation of the printing press, which facilitated the widespread dissemination of tactical manuals – resulted in an evolution of Dutch army tactics away from massed pike charges and towards smaller unit, firearm-equipped manoeuvre warfare.[57] Contemporary research demonstrates that such forms of warfare, when executed by well-trained, -equipped, and -led personnel,

[52] (Israel, 1995, p. 267)
[53] (Israel, 1995, pp. 267-268)
[54] Indeed, it is important to note that most militaries of this period were beset by problems of ill-disciplined and poorly trained troops organised into irregular groups that often deserted, 'disloyal mercenaries, inadequate supplies, transport problems, [and] unstandardized weapons,' meaning that they cannot be thought of as the 'predictable and reliable instruments of state' that we recognise today: (Kennedy, 1987, p. 71)
[55] (Israel, 1995, p. 268)
[56] (Parker, June 1976, p. 202)
[57] (Parker, June 1976, p. 202)

deliver a level of combat power out of proportion to the overall size of the force in comparison to simple mass charges.[58] Meanwhile, other recent research demonstrates that, all else held equal, the forces of more liberal and more developed states – such as the Dutch Republic was in comparison to its principal military rivals – will be better at producing the quality of personnel, and particularly the high-quality junior officers and non-commissioned officers, necessary to sustain such capital-, skill-, and initiative-intensive forms of warfare.[59] In short, a number of qualitative factors combined to make the Dutch army of the early and middle Golden Age much more powerful than a simple assessment of aggregate force size would suggest. And as the discussion above demonstrates, all of these qualitative advantages owed at least in part to the Netherlands' pronounced economic development lead.

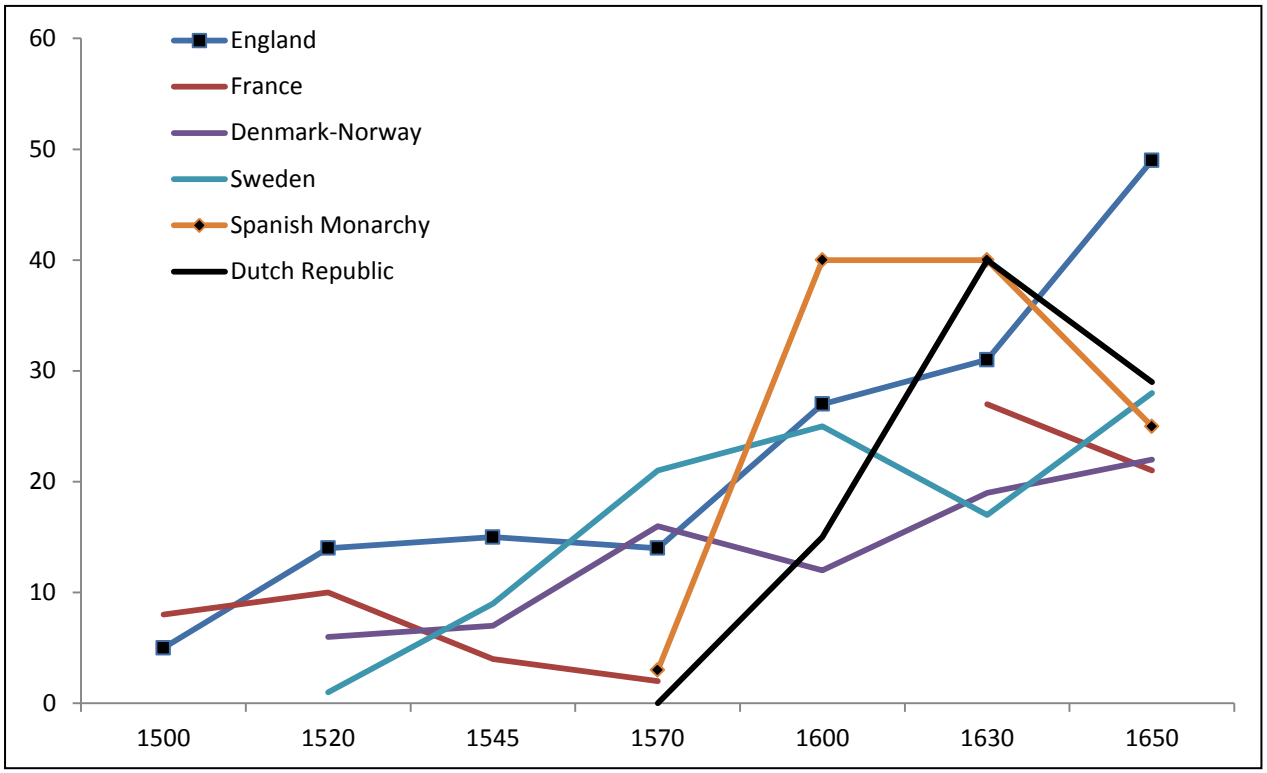
Figure 19. Military Personnel as a Proportion of National Population, %, 1500-1700



Source: Tilly (1992), p. 79.

[58] (Biddle, 2004)
[59] On liberal states' comparative combat effectiveness, see (Reiter & Stam, 2002) On developed states' comparative combat effectiveness, see (Beckley, February 2010)

Figure 20. Major Powers' Navies by Quantity of Sailing Warships, thousands of tonnes, 1500-1650



Source: Glete (2002), p. 37. Data only includes vessels of more than 100 tonnes, meaning that very small naval craft do not count towards states' respective totals. Oared galleys also excluded, due to limited seaworthiness.

Moving to another salient dimension of military power, figure 20 presents data on the major European powers' respective sailing warship tonnages for the period 1500 to 1650.[60] This chart provides further support to the argument that the Netherlands' economic rise altered the European military balance of the late sixteenth and whole seventeenth centuries, given the pivotal role that naval strength played in Dutch prosperity, influence, and indeed, survival.[61] The Dutch Republic went from not possessing a sovereign navy in 1570 to possess Europe's joint-largest fleet only sixty years later – and, while it was overtaken by England between 1630 and 1650, it achieved a naval lead over its old rival and former imperial master, Spain, during the same period. Referring back to figure 4 is also instructive, in that it shows the size of the Dutch navy in terms of personnel expanding by 166.7 percent in only

[60] (Glete, 2002a, p. 37)
[61] (J. R. Jones, February 1988)

thirty years, between 1610 and 1640.[62] Moreover, on the qualitative side, the Dutch navy – like the army – was known for its high-quality materiel and personnel during the period, as evidenced most clearly by its favourable performance (with a few major exceptions) – particularly its usually proficient leadership – during its confrontations with England's navy during the first two Anglo-Dutch wars.[63]

Of course, such naval expansion existed in a supply-and-demand relationship with the expansion of Dutch international commerce. Increased profits from international trade – coupled to the financial wherewithal of Amsterdam banks and advanced engineering skills that flowed into the Republic following independence – made such a pronounced expansion of naval capacity possible. Yet that very international trade was also a key driver of the need for such a capable maritime military force. The key point, however, is that Dutch naval expansion on this scale could never have occurred in the absence of massive economic growth. Insofar as this naval growth had a significant impact on the European balance of power, which in turn contributed to major power competition in the period – particularly via shifts in the respective strategic positions of the Netherlands, England, and Spain, as will be discussed below – this is another mechanism by which Dutch economic growth in the period had major strategic consequences. And insofar as international economic exchange impacted Dutch growth, this is further evidence that such exchange had a substantive impact on major power competition and ultimately conflict during the Dutch Golden Age. Summarised in the words of J. L. Price, 'The spectacular growth of the Dutch economy helps to explain why these few provinces in the northern Netherlands could establish their independence against the might of Spain; and this success provided the financial strength that was necessary to sustain the Republic's position as a major power throughout the seventeenth century.'[64]

[62] (Maddison, 2003b)
[63] On Dutch naval discipline, see (Israel, 1995, p. 679) On the (mixed but more-frequently-high) quality of Dutch naval leadership and command, see (Israel, 1995, pp. 720-721)
[64] (Price, 1998, p. 39)

Figure 21. Map of the Dutch Republic and Neighbouring Territories, 1581

Source: Wikimedia Commons (accessed online on 22 April 2012 at http://en.wikipedia.org/wiki/File:Republiek_der_Zeven_Verenigde_Nederlanden.svg)

The previous section discussed the impact of Dutch economic growth on the European balance of power in general terms. This section progresses to consider the consequences of specific balance-of-power dynamics for major power competition and conflict within the period. It first looks at some national-level data on the strategic competition between the Netherlands and Spain. It then progresses to consider how strategic competition – between the Netherlands and the Habsburg bloc on land, and between the Netherlands and England at sea – contributed to the outbreak of major power war in the period. The focus of the latter discussion is the outbreak of Europe's first truly systemic major power conflagration, the Thirty Years' War (1618-1648), along with the first three Anglo-Dutch wars (1652-1654, 1665-1667, and 1672-1674).

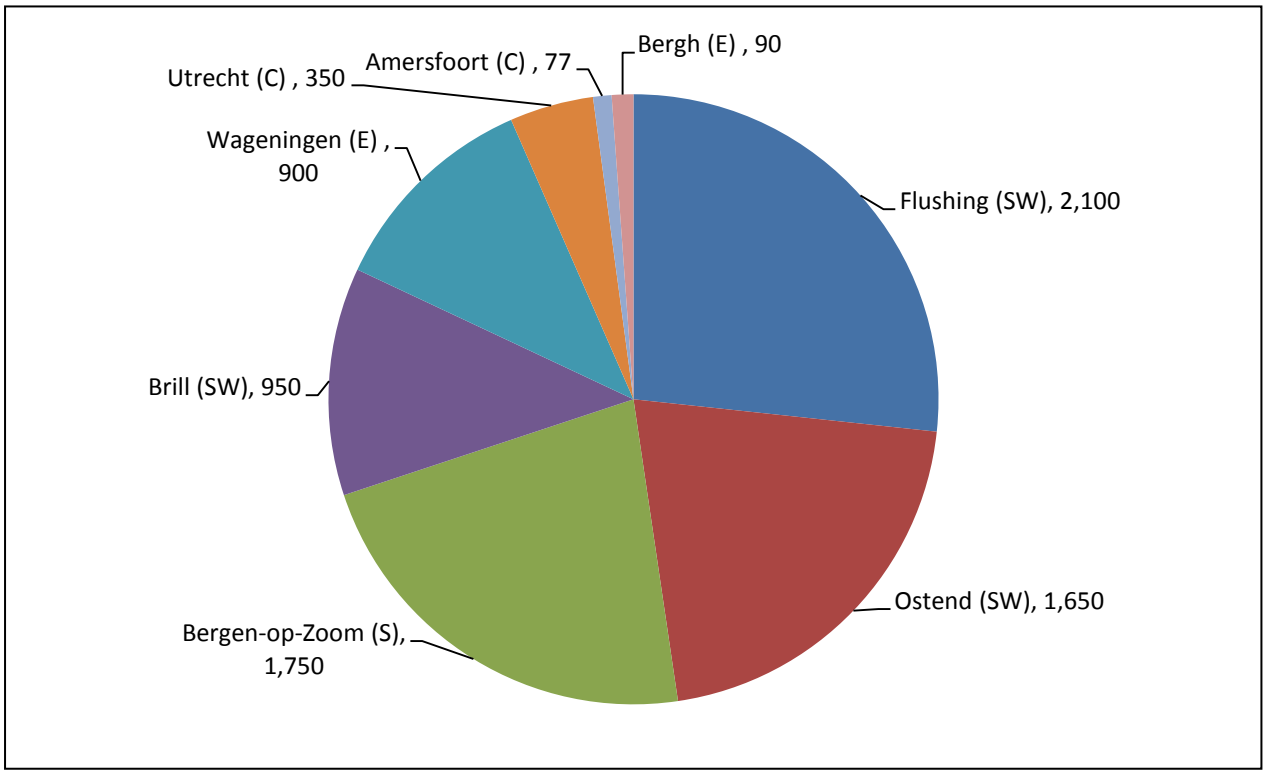
To provide a first sense of the strategic situation in the Low Countries at the start of the Golden Age, figure 21 provides a map of the Dutch Republic, divided by its provinces, circa independence in 1581. The still-Habsburg Spanish (Southern) Netherlands are to the south in what is now modern Belgium. The various principalities and duchies of the Holy Roman Empire in what is now modern Germany are to the east.

The Republic in its first decade of existence was comparatively weak and vulnerable to coercion or even possible re-annexation by military action from the Habsburg Empire. In terms of geographic coverage, population, and accumulated resources – most notably gold and silver imports from colonies in the Americas – the Habsburg bloc was a potential European hegemon, and behaved as such in pushing for military and political dominance throughout the sixteenth and early seventeenth centuries.[65] Yet most successful great powers have enjoyed a measure of luck in the early days of their rise. For the recently-independent Dutch, this slice of luck came in the form of the strategic interaction between Spain and England when the Republic was still at its most vulnerable. In the 1586, the England of

[65] (Kennedy, 1987, pp. 31-72; Watson, 2009, pp. 129-138)

Queen Elizabeth I deployed an expeditionary force of 6,350 infantry and 1,000 cavalry to the United Provinces at the invitation of the Republic – the August 1585 Treaty of Nonsuch was the United Provinces' first treaty with another European state – under the command of the Earl of Leicester. From the Dutch perspective, a strong military force from a fellow Protestant external power would serve as a safeguard against both the Catholic Habsburgs and against Holland exercising total hegemony over the other Provinces.[66]

Figure 22. Nominal Size of English Garrisons in the Netherlands, 1588



Source: Israel (1998), p. 238. Actual deployed numbers estimated at an average of 76 percent of reported nominal troop strength. Letters in (parentheses) denote geographical position of each garrison by its location within or just outside the borders of the Republic, e.g. 'E' denotes the eastern Netherlands; 'C' is centre.

By 1588, however, this was no longer looking so wise from a Dutch perspective: the English troops were disruptive and volatile, while Leicester had bolstered anti-Holland factions – thereby causing tension within the Dutch body politic – in an attempt to get the

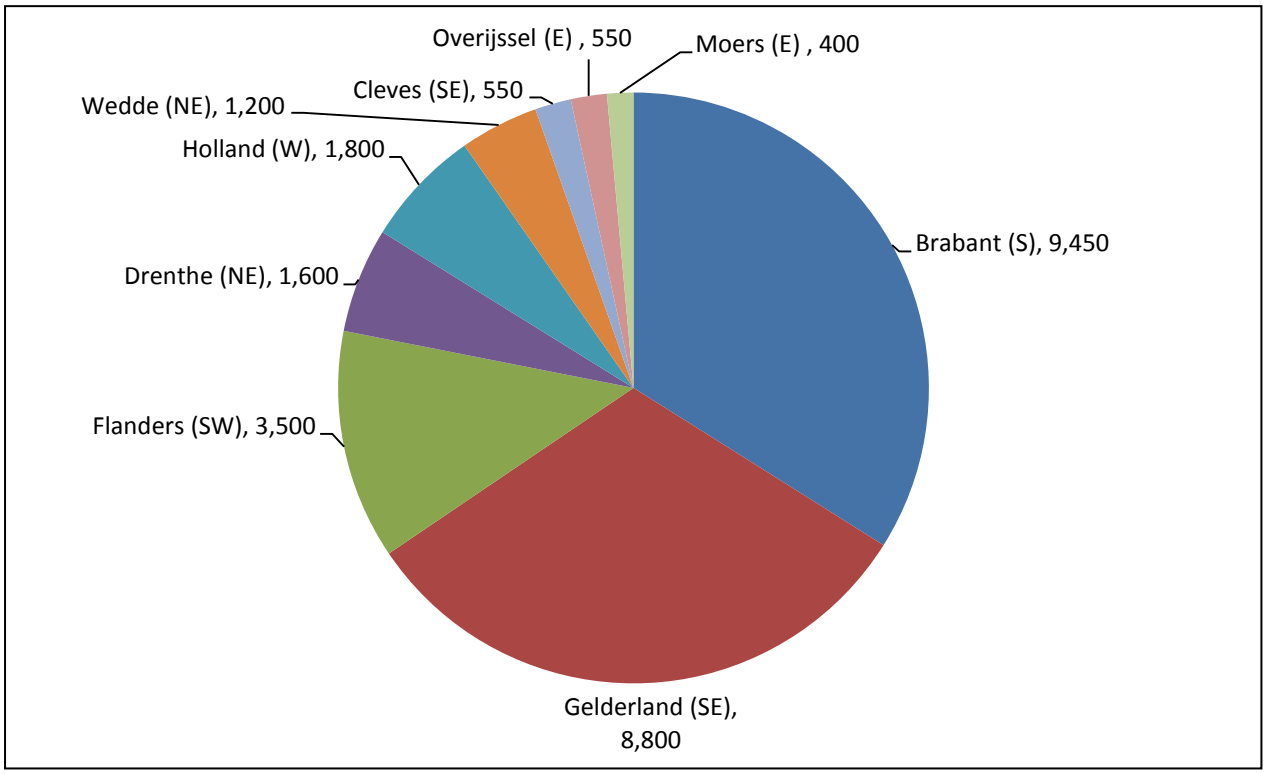
[66] (Israel, 1995, p. 220)

Provinces to ultimately submit to Elizabeth's sovereignty.[67] Yet Philip II's 1588 Armada assault on England shifted the fractious alliance back in a positive direction once again. Realising the importance of Dutch cooperation in the maritime realm, and the utility of bolstering a former Spanish possession as a military bulwark on the continent, Elizabeth instructed her commanders to militarily back Maurits of Nassau, Prince of Orange, captain-general and *stadtholder* of the Republic, and to withdraw support from the anti-Holland factions.[68] The strength and geographic location of the English garrisons in the Netherlands in 1588 is shown in figure 22; as the chart makes clear, the majority were concentrated in the south, near the border with the Spanish Netherlands.[69] Ironically, therefore, the Spanish Armada's assault against England bought the Dutch not only a reprieve from internal destabilisation by the English military presence, but also a renewal of the latter's utility as an ally during the Republic's own ongoing efforts to consolidate and arm adequately to resist potential external coercion – most notably by Spain.[70]

By the early seventeenth century, this domestic consolidation and armament process had run far enough for the Republic itself to field a strong defensive perimeter against the possible predations of outside powers. In addition to the preceding discussion of Dutch fortification building and military modernisation, figure 23 provides data on the Republic's border garrison strength by province and geographic location in 1607.[71] All told, the Republic had nearly 28,000 troops in or around its border fortifications, with the overwhelming concentration again to the south, around the border with the still-Habsburg Southern Netherlands – an impressive achievement for a state still not thirty years old at the time.

[67] (Israel, 1995, pp. 233-236)
[68] (Israel, 1995, p. 237)
[69] (Israel, 1995, p. 238)
[70] (Israel, 1995, p. 237)
[71] (Israel, 1995, p. 264)

Figure 23. Dutch Garrison Strength by Province, 1607

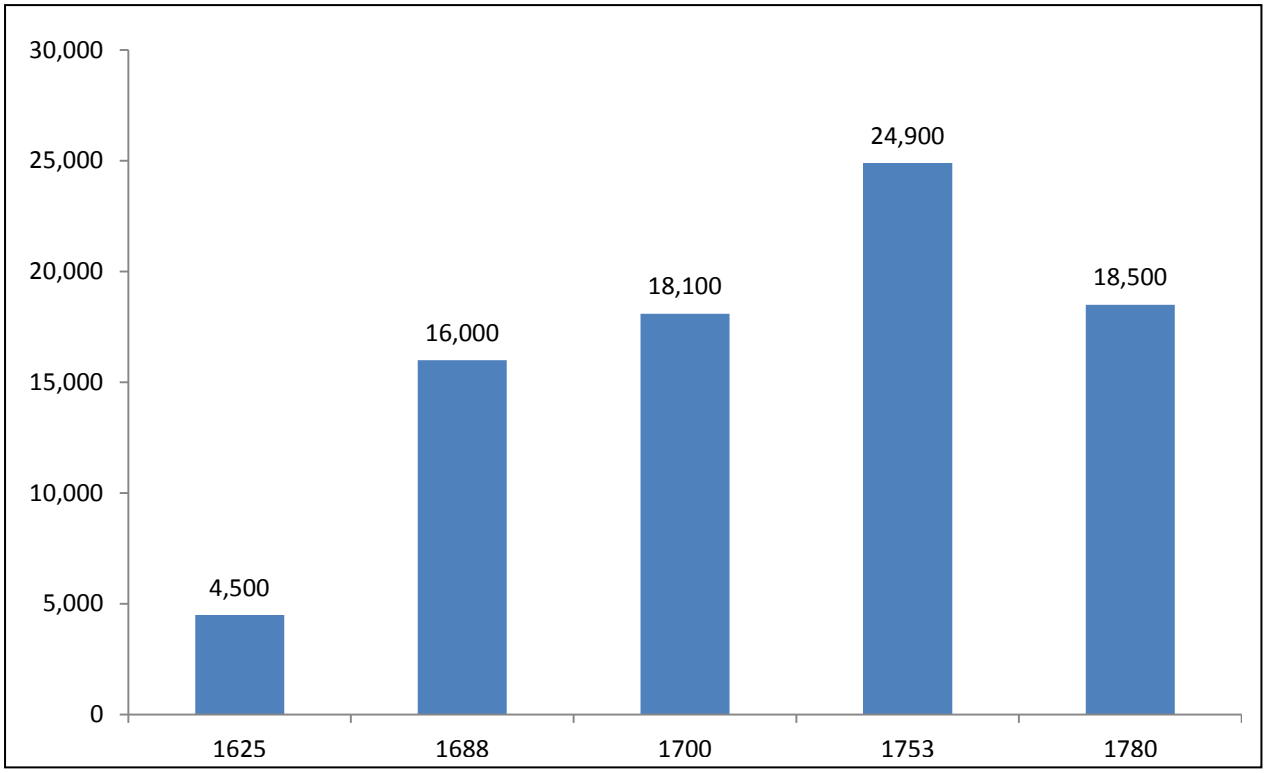


Source: Israel (1998), p. 264. Data is for the various garrisons that constituted the Dutch defensive perimeter against neighbouring states. Letters in (parentheses) denote geographical position of each garrison by its location on the Dutch border, i.e. 'W' denotes a garrison in the west of the Republic, 'SE' is southeast, etc.

In terms of personnel that the Republic was able to mobilise for purposes other than territorial perimeter defence, the number of *VOC* employees deployed to Asia boomed throughout the seventeenth century, as figure 24 makes clear.[72] Of course, the *VOC* was not the same as the army or navy, insofar as it was not a publicly-owned coercive instrument of the state. Nonetheless, as a state-backed monopoly with a nationally-granted legal remit to use violent force abroad, this provides clear evidence of the growth of Dutch imperial power – growth that largely came at the expense of Habsburg interests in Asia, an picture further supported by referring back to figure 3 (Portugal being joined to the Spanish crown as part of the Iberian Union from 1580 to 1640).

[72] (de Vries & van der Woude, 1997, p. 432) See also figure 4 for the growth of non-army military (that is, naval) employment.

Figure 24. Total Dutch East India Company (*VOC*) Personnel in Asia, 1625-1780



Source: de Vries and van der Woude (1997), p. 432. Includes both personnel ashore in trading stations and personnel at sea in Asia aboard *VOC* vessels.

Just as Dutch forces were arrayed to defend against Spain in the early years of the Golden Age, so too Spanish forces, for their part, were arrayed to contain and threaten the Republic. Figure 25 presents data on the strength and location of Habsburg garrisons near the Dutch border between December 1626 and February 1628, during the Thirty Years' War.[73] As the chart makes clear, the Spanish maintained a comprehensive ring of army units around the Republic in this period – and indeed, boosted their total containment troop presence by 21.7 percent during this fourteen-month window alone, particularly the large garrisons on the Dutch southern border, to more than 20,000 personnel.

The value of such data on the rise of Dutch imperial power at the expense of Habsburg interests, and particularly on the Dutch army's defensive perimeter and the Spanish army's encircling ring, is to illustrate the proximity and intensity of the two powers' strategic

[73] (Israel, 1995, p. 498) It would of course be ideal to have the Dutch defensive perimeter garrison data and the Spanish encircling ring garrison data from the same year(s), but such figures were unfortunately not available.

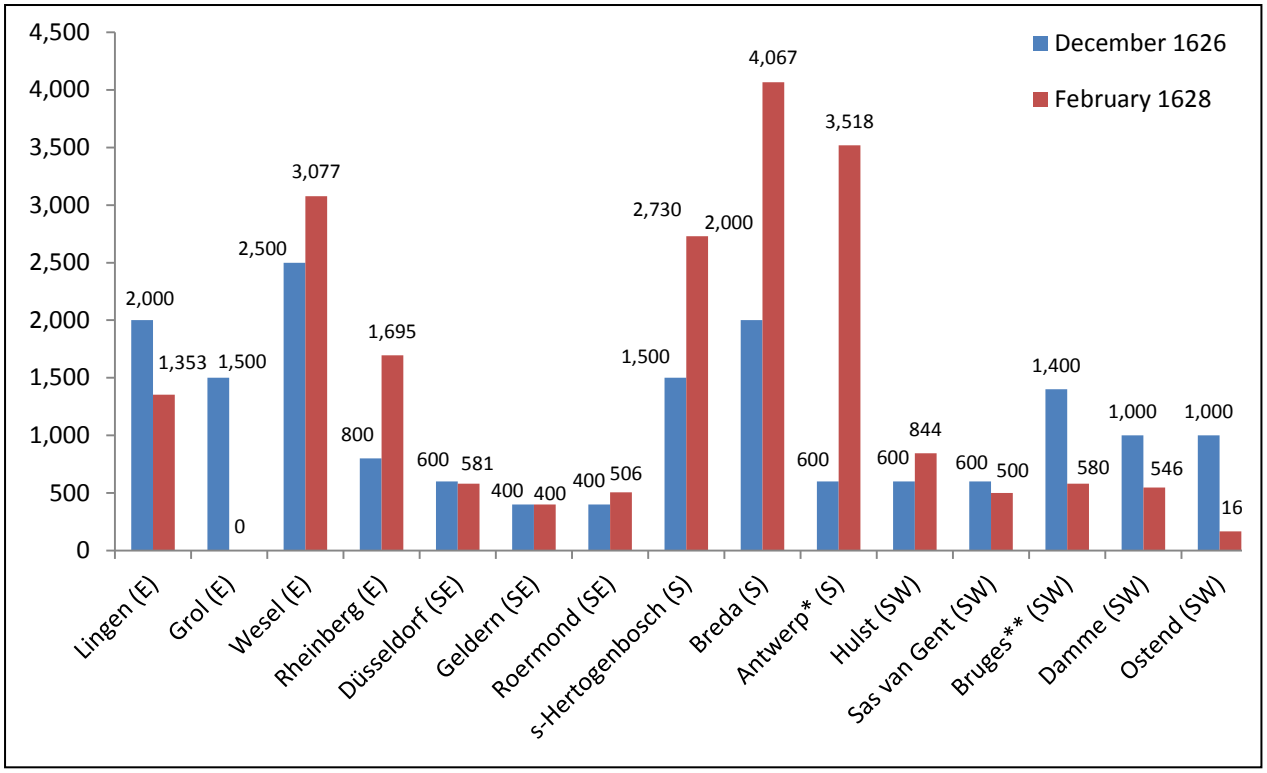
rivalry and the security dilemma dynamics that were in play in the early seventeenth century.[74] To be sure, it may have been a security dilemma with religious, ideological and commercial facets, on top of the core concern for territorial integrity, but it can be thought of using security dilemma logic nonetheless.[75] Indeed, the whole period of conflict from the beginning of the Dutch Revolt in 1568 to the Peace of Westphalia in 1648 is known as the Eighty Years' War; it can be regarded as conflict between great powers from around 1600 onwards. Insofar as this strategic competition would not have unfolded as it did in the absence of the Dutch rise to major power status, differential economic growth qualifies as a key cause.[76] And insofar as international economic engagement at least contributed to that differential growth, so that engagement also contributed to major power strategic competition in the early seventeenth century.

What was the result of this strategic competition in terms of actual major power conflict? The single most important outcome was that it contributed to Europe's first truly region-wide systemic major power war, the Thirty Years' War; a conflict estimated to have killed around eight million soldiers and civilians over its course, and which – at least in terms of naval combat – was global in scope.[77] In 1618-1620, the militant Protestant states in Germany that were rebelling against the (Catholic) Holy Roman Empire had only one plausible source of external major power support: the United Provinces.[78] This was around the time that the shaky Twelve Years' Truce between the Dutch and Spanish was due to

[74] The Dutch incentive to balance Spain, Europe's pre-eminent land power for much of the early seventeenth century, is particularly obvious, given the existential threat to territorial integrity and national survival that Spain posed to the early Republic: (Levy & Thompson, January-March 2005, pp. 15-33)
[75] On the role of religious networks and divisions in challenging pre-Westphalian imperial political structures in a way that shifted power relations in a destabilising direction, see (Nexon, 2009)
[76] Note here that this is not to contend that had the Republic *not* become a major power, but rather remained a minor power, warm and amicable relations with Spain would have ensued; on the contrary, given its environment, military greatness was probably the only route by which the new state could ensure its long-term independence and survival. Nonetheless, once a minor power has been annexed or made into a vassal, the aftermath is certainly more peaceful (from the perspective of major power conflict), even though that outcome may well not best serve the interests of the population of the annexed state.
[77] (N. Davies, 1996, p. 568; Glete, 2002b, p. 165)
[78] (Israel, 1995, p. 465)

expire, and each – deeply suspicious of the other – was seeking to position itself for strategic advantage, with intervention in Germany one possible vehicle for doing so.

Figure 25. Size of Spanish Garrisons Encircling the Dutch Republic, 1626-1628



Source: Israel (1998), p. 498. Data is for the Spanish garrisons proximate to the Dutch defensive perimeter. Letters in (parentheses) denote geographical position of each garrison by its location on the Dutch border, i.e. 'E' denotes a garrison just to the east of the Republic, while 'SW' is southwest, and so forth. *Antwerp data includes Zandvliet. **Bruges data includes the Bruges-Ghent Canal area.

Maurits, the Dutch *stadtholder*, initially kept leaders of all rival parties with a stake in the unfolding German rebellion uncertain over the Netherlands' likely behaviour.[79] At the pivotal moment, however, Maurits committed the Republic to support Frederick V's Protestant insurgency should the latter, the Elector of the Palatinate at that time (and Maurits' nephew), accept the crown of Bohemia, thereby marking a decisive split from the Holy Roman Empire. Frederick did just that – contrary to the urgings of Britain's James I, his father-in-law, who argued that the risks of a major conflagration following from such an action were too high – in November 1619, marking a success for Maurits' effort to

[79] (Israel, 1995, pp. 466-467)

manoeuvre Frederick into becoming a useful proxy for targeting the Holy Roman Empire and its Spanish backers.[80]

The Republic then moved to supply the Protestant side with war funding (a 50,000-guilder monthly subsidy to the Bohemians and, subsequently, a like sum to the German Protestant Union), troops (to both Bohemia and the Palatinate), and assistance raising additional finance for the war effort on the Amsterdam money markets.[81] Around 5,000 of the Protestant troops who faced the combined army of the Holy Roman Empire and Habsburg Spain at the Battle of the White Mountain – which went disastrously for the Protestant side – were Dutch or Dutch-funded. In addition, the Republic was the principal source of arms and munitions for the Protestant side throughout the war.[82] In sum, the Dutch played a pivotal role in precipitating and then sustaining the Protestant side during the Thirty Years' War, largely as a means by which to better their strategic position relative to Spain.[83] Denmark entered the war in 1625, followed by France and Gustavus Adolphus's Sweden in the 1630s, as each power saw opportunities offered by the disruption in Germany, further explaining how what had started as an intra-Habsburg 'civil' conflict became such a long-running and system-spanning conflagration.[84] Moreover, while the early years of the war went badly for the Protestant side, the later war and eventual peace settlement substantially curtailed Habsburg power, restored a more stable continental balance of power,[85] and yielded an improvement in the Republic's strategic position[86] – albeit at a high cost – including formal recognition of independence from the Habsburgs.

[80] (Israel, 1995, p. 469) For a discussion of Dutch and Spanish interaction within the wider context of the war's origins, see (Gutmann, Spring 1988) For an overview, see (Parker, 2006)
[81] (Israel, 1995, p. 469)
[82] (Puype & van der Hoeven, 1996)
[83] (Israel, 1995, pp. 469-471)
[84] (Gutmann, Spring 1988, pp. 749-750)
[85] (Hui, 2005, pp. 109-110)
[86] (Watson, 2009, pp. 139-150)

By 1652, only four years after the Netherlands' 1648 success on land, another strategic competition with a rival major power was evolving. Prior to the end of the Thirty Years' War, Dutch trade with the Iberian peninsula and its immediate region had been weak relative to Dutch commercial success elsewhere, as an unsurprising consequence of being at war with the Habsburg Spanish and Portuguese.[87] This meant that, even as they had been crowded out of traditional markets in the Baltic, Germany, Scandinavia, and Russia, the English trading position in southern Europe improved. The return of the Dutch – by then the world's pre-eminent trading state, with the largest merchant fleet, lowest freight rates, and best financial system – to southern European commerce after the Peace of Westphalia therefore presented a grave threat to English trade and, subsequently, England's power position and prosperity.[88]

As a consequence, in August 1651, Parliament passed the Navigation Act, which prohibited imports to England and the English colonies of both Dutch imperial produce and other states' produce carried by Dutch ships. Even more critically, the English navy and privateers – emboldened by the Navigation Act – stepped up harassment of the Dutch merchant marine around the world, seizing at least 140 Dutch ships in 1651 alone.[89] The result of this unsustainably hostile pattern of interaction was the First Anglo-Dutch War of 1652-54, a naval conflict that – following serious Dutch reversals in the early and middle parts of the war, but with England ultimately unable to sustain economically the blockade that their earlier naval successes had enabled – culminated with Dutch acceptance of the Navigation Act but without making major concessions to English maritime and imperial interests.[90] In short, the two sea powers moved from commercial competition to strategic

[87] (Israel, 1995, p. 713) Note, of course, that Portugal re-seceded from the Habsburg crown in 1640.
[88] (Israel, 1995, pp. 713-714)
[89] (Israel, 1995, p. 715)
[90] (Israel, 1995, p. 726)

competition to war.[91] Again, this fits with the dissertation's wider theory: the Dutch Republic's commerce-enabled rise to great power status resulted in strategic competition with another major power, manifested through their respective merchant maritime and naval relations, and resulted in a serious limited war between the two.

Twice more during the period of peak Dutch power, the Republic went to war with England: the Second Anglo-Dutch War of 1665-67 and the Third Anglo-Dutch War of 1672-74 (which also featured France on the English side). An extensive discussion of the causes and contexts of these two conflicts lies beyond the scope and needs of this chapter. Suffice it to say, however, that the situation of persistently recurring military – and particularly naval – competition between Europe's two principal maritime powers (and its largest single continental power also, in the latter case) during this period would have been unlikely to occur in the absence of the Netherlands' earlier commerce-enabled rise or, indeed, the beginnings of England's relative rise (see the respective GDP per capita growth trajectories detailed in figure 11).

Caveating and Contextualising the Argument, 1581-1674

Despite the clear fit between the dissertation's theory and the European experience between 1581 and 1674, the evidence also requires a degree of caveating, bounding, and placing in context. The first section below presents necessary caveating and contextualisation on the economic side, while the subsequent section does the same for power shifts and conflict outcomes.

[91] (Levy & Ali, 1999, p. 31)

Economic Caveats

One of the key implications of figure 11 is that, from around the middle of the sixteenth century, the Netherlands had a higher GDP per capita than any other European country. At first glance, therefore, this appears to present a problem for a theory of power shifts based on commerce-enabled *catch-up* growth. There are two powerful rejoinders to this charge, however. First, as made clear throughout the discussion of the drivers of strong early Dutch growth, the most influential flows of capital and technology during this period were not so much between modern nation-states as between key cities and regions. Figure 11 is presenting data on the GDP per capita of European nation-states as defined by their contemporary, early twenty-first century borders. Such data may show 'Belgium' or 'Italy' as less developed than the 'Netherlands' during the late sixteenth and early seventeenth centuries. Yet the flows of finance, skills, engineering expertise, and so forth documented earlier in the chapter that played the most important role in the Dutch Republic's economic rise were those from such key centres as Antwerp, in modern-day Belgium, and the Italian city states. 'Belgium' and 'Italy,' as they are now defined, may have been less developed than the Netherlands, but that does not mean that the micro-level mechanisms of diffusion and catch-up were not at work in the manner described qualitatively earlier in the chapter.

Moreover, it is worth recalling that Asia accounted for more than 60 percent of world GDP during the first half of the second millennium, reflecting levels of development that the European states only later began to rival, with Asian knowledge diffusion playing a significant role.[92] As such, and in keeping with the argument that micro-level catch-up processes can still be at work even if an intra-European GDP per capita comparison done at the national level appears to suggest otherwise, the expansion of Dutch trade with Asia to the

[92] (Maddison, 2003a; 2005, p. 59)

point where it dwarfed that of other European powers similarly left the Netherlands better placed to reap gains from Asian innovations and practices.

Second, the flip side of the coin when it comes to understanding why the Dutch appeared to be benefitting from superior levels of commerce-enabled growth even once their GDP per capita was Europe's highest is understanding why rival powers did *not* experience comparable convergence growth. As will be discussed at greater length below, a key factor here was the relative superiority of Dutch political and economic institutions – and, correspondingly, the relative inferiority of such institutions in rival commercial powers. Habsburg Spain, in particular, had a weaker fiscal-administrative and political structure, and an indebted and agrarian economic model kept afloat by colonial bullion imports:[93] plus, during the Iberian Union, Portugal – once Europe's principal maritime trading power – was tied to the same inefficient economic bloc. France, too, was a large but predominantly agrarian monarchical economy.[94] As such, not only was the Netherlands Europe's principal international trading state and financial centre during this period, as is well documented above, but it was also better placed than others to reap the gains from trade, financial flows, and technology diffusion in a way that other large but institutionally backwards European powers simply were not. In other words, the latter category of state – most notably Spain, France, and Portugal – had a far lower absorption capacity than the Dutch Republic. And the one rival European power that saw an institutional shake-up later in the seventeenth century coupled to a deepening integration into the then-Dutch-led international trading and financial system, England, was also the one that experienced a rapid relative rise after the passing of the Dutch Golden Age.

[93] (Elliott, 2002 [1964], pp. 285-291) That said, the use of the 'backward' label as applied to Southern Europe – France, Spain, and Portugal – relative to the 'modern' Atlantic economies of the Netherlands and England is open to debate, given that *all* major European economies were clearly taking important modernising steps and experiencing economic development during the period: (Musgrave, 1999)

[94] Indeed, the behaviour of the Habsburg bloc and France (until the Revolutionary period) can be considered 'self-weakening,' with the 'self-strengthening' antonym applying to the Dutch and Sweden in the early-to-mid-seventeenth century and England/Britain in the late seventeenth and eighteenth: (Hui, 2005, pp. 111-167)

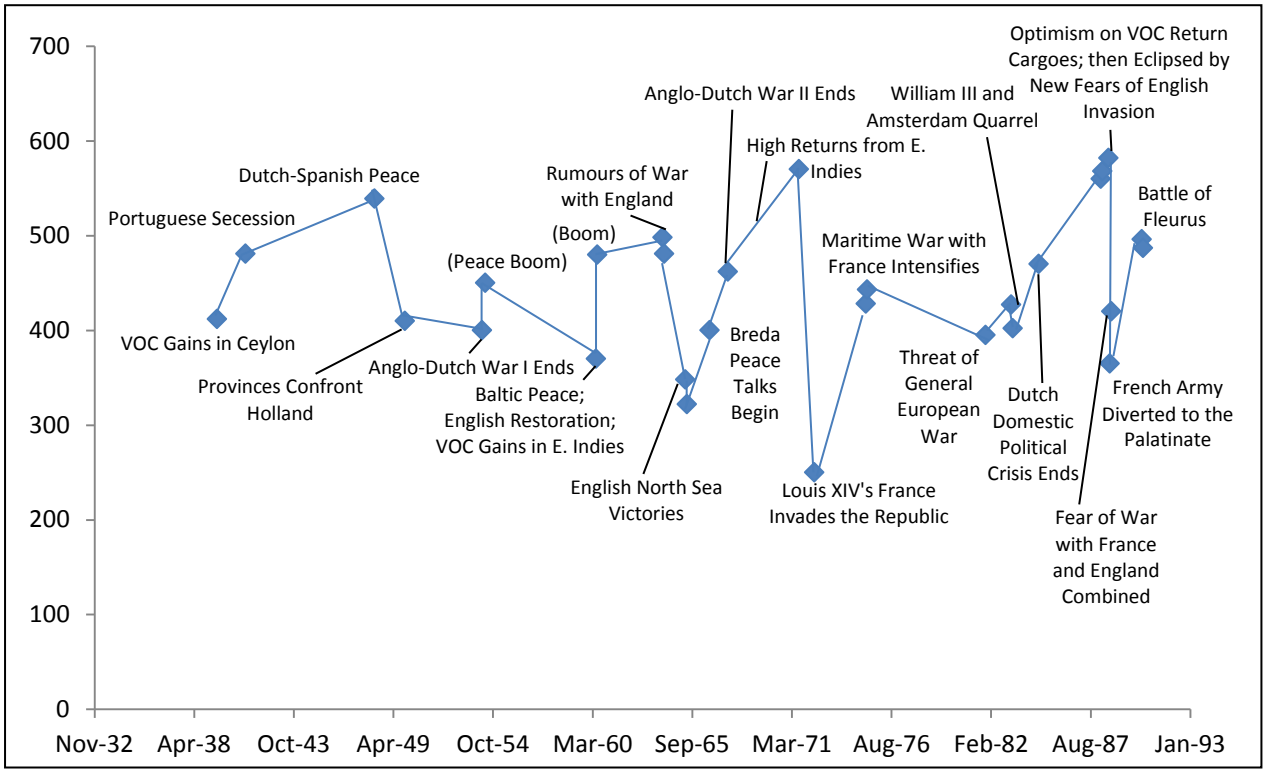
Moving beyond the catch-up puzzle and building on the implication of the previous paragraph, in understanding the economic underpinnings of the Dutch Republic's relative rise from rebellious peripheral province to European great power, while the international dimension was clearly important, the importance of the efficacy of the Netherlands' domestic economy cannot be underestimated. On the financial side, for instance, while there were significant international flows, the single most important factor in explaining the Dutch ability to raise capital for both business investment and national strategic ends was the domestic development of the Republic's own financial system. This was manifested by the development of the stock market, which allowed firms to raise capital and investors to profit from businesses' respective performance, merchant banking, which had similar effects, the bond market, which allowed governments to raise money in Amsterdam, and the insurance industry, which offset the risks of – and thereby promoted – international commerce.[95]

As figure 26 makes clear, by the standards of the time, the Dutch stock market was remarkably liquid, with the share price of the Dutch East India Company tracking geopolitical and economic shocks closely.[96] Moreover, as a republic, it was able to avoid the temptations of currency debasement that afflicted monarchical regimes, making Amsterdam a doubly alluring centre for international finance (Spain, by contrast, resorted to seigniorage to fund its early seventeenth century wars).[97] Of course, parsing out the relative significance of the international and domestic dimensions of capital markets is difficult – the quality of Dutch (domestic) financial institutions was a key draw to foreign investors, savers, and borrowers – and for the purposes of this dissertation, the key point is that there was an important international element. A comparative example is also instructive: Sweden transformed its domestic economic and fiscal-administrative state system in the early

[95] (Arrighi, May-June 2005, pp. 93-96; de Vries & van der Woude, 1997, pp. 96-147)
[96] (Israel, 1995, p. 848) On the completeness and liquidity of the Dutch stock market, see (Gelderblom & Jonker, September 2004)
[97] (Hart, 1997, p. 19; Motomura, March 1994)

seventeenth century, and experienced relative power growth and great military success as a consequence,[98] but its economic rise was not *as* stellar as the Dutch Republic's, and tellingly, Sweden did not benefit from the same level of international economic flow. Nonetheless, it remains important to recognise the significance of the domestic component.

Figure 26. Dutch East India Company (*VOC*) Share Price and Major Geopolitical Events, % of face value, 1639-1690



Source: Israel (1998), p. 848.

Moving from the financial sector to institutions more generally, the United Provinces' republican constitution delivered wider benefits. The relationship of the seven voting provinces was somewhere between a 'confederacy in form and theory, and more of the federal state in substance and practice,' with Holland playing the leading role vis-à-vis the other provinces that its relative size, population, and wealth facilitated.[99] While a comprehensive federal tax system was never introduced, allowing a degree of fiscal

[98] (Glete, 2002a, pp. 147-179)
[99] (Israel, 1995, p. 277) Put in context, Holland contributed 60 percent of the Republic's total military spending: (Tracy, 2008, p. 1)

flexibility to focus on priorities at the provincial level, overall levels of expenditure and taxation were centrally fixed with an eye to 'common advice and consent.'[100] The result was a fiscal system with a capability to harness economic output for national means superior to that of the less developed European monarchies.[101] And of course, paying to hedge against and ultimately fight a war of survival against more populous neighbours created considerable demand-side pressure for financial and fiscal institutional development.[102]

Meanwhile, the Dutch state's federal structure and the high degree of civic autonomy made possible the formation of a new form of commercial entity – the chartered joint-stock monopoly – which could act as a 'national champion,' supported politically and militarily by the state while keeping capital holdings and commercial operations separate from each other.[103] The international success of the Dutch East India Company, at the expense of smaller foreign merchants (such as those of the Portuguese), can be understood against this backdrop, and it was a model later adopted with even more success by the English. The States-General – which replaced the king as the supreme political authority after his deposition – functioned as a council in which each province had a vote. And while many of the ruling regents at the provincial level were drawn from the pre-Revolt nobility, others were merchants or professionals of varying means, creating – if not a representative system of government based on a democratic franchise – at least a somewhat more representative system of oligarchy than prevailed in other continental European powers (although it should be noted that the Dutch political system overall was messy and frequently dysfunctional).[104] There was also an extensive system of publicly managed and regulated civic relief for the

[100] (Israel, 1995, p. 285)
[101] (Fritschy, February 2003, pp. 67-74; Glete, 2002a, pp. 118-146)
[102] (Kennedy, 1987, pp. 70-72; Tilly, 1992)
[103] (Israel, 1995, p. 321)
[104] (Israel, 1995, pp. 341-342; Prak, 2005, p. 3)

poor, hospitals, and care homes for orphans, the elderly, the disabled, and veterans;[105] there was even a graded system of military pensions for the injured.[106]

In short, at least until the late seventeenth century, when a combination of political and economic conditions resulted in the Republic's fiscal system coming under increasing strain,[107] the Netherlands' administrative and organisational ability to mobilise the state for national ends surpassed that of rival European powers; it was, simply put, a more 'modern' state in every key respect (with Sweden being perhaps its nearest peer in the seventeenth century and Britain matching it in the eighteenth). Moreover, even in terms of simple geographical factor endowments – a component of any state's growth potential that clearly lies beyond the scope of influence by international market forces – the Netherlands' position as a coastal hub at the centre of the north-western European international commercial and political system naturally facilitated its rise as a maritime trading power,[108] just as island status did for England. That said, of course, the interaction of maritime commerce, Atlantic geography, and institutions – which were not rigid, but adapted over time to address the demands of commerce-empowered merchant classes – was itself self-reinforcing as a cause of strong relative growth in the Netherlands and later England, so the domestic and international need not be seen in 'either/or' terms here.[109]

Finally, of course, it is worth reiterating at this stage that the growth of international economic 'integration' – as measured by the expansion of international trade documented earlier in the chapter – was itself endogenous to the growth of Dutch power. The catch-up growth theory and evidence outlined earlier in the dissertation, coupled to the micro-level processes specific to this case detailed in the chapter, make clear that trade made the Dutch richer and thus facilitated the Republic's relative rise as a great power – so trade growth

[105] (Israel, 1995, pp. 353-360)
[106] (Israel, 1995, p. 717)
[107] (de Vries & van der Woude, 1997, p. 117)
[108] (Dehing & Hart, 1997, p. 37; Lindblad, 1993)
[109] (Acemoglu, Johnson, & Robinson, May 2005)

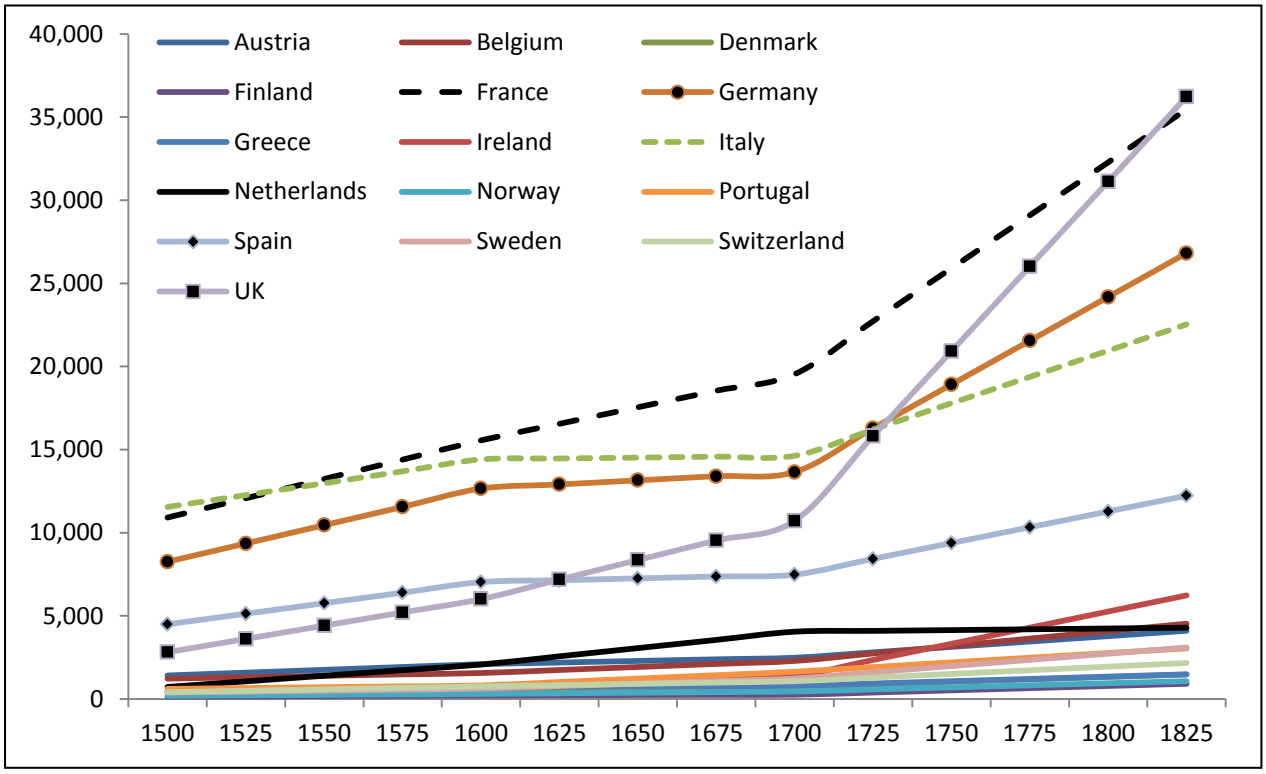
should not simply be seen as an outcome power growth. Nonetheless, there is clearly a circular aspect to the process. As the Netherlands became more powerful, their military forces had the wherewithal to secure Dutch commerce and drive out competitors (the demise of Portuguese rivals being a clear instance), which in turn made the Netherlands richer, which in turn made them more powerful still, producing an internally supportive cycle. In short, international commerce was both a cause and an effect of power growth.

Insofar as Dutch military power – a political factor – was important for the expansion of international commerce in the period, it is worth considering another political dimension to international economic openness in closing this section. At any particular point during this period, the precise level of economic openness achieved was a consequence not only of market forces but also of political choices: most notably, certain states' decisions to trade or not trade with others. Tellingly, and interestingly for theorists interested in understanding why states do or do not attempt economic containment against rising rivals, Spanish choices vis-à-vis trade with the Republic do much to explain the latter's strong, commerce-enabled growth: growth that, ultimately, turned the Netherlands into a viable European great power and rival to Spain. In 1590, Philip II of Spain lifted his embargo Dutch ships and cargoes trading with the Iberian peninsula,[110] concerned as he was about competition with England and seeking to somewhat normalise relations with the Republic. Yet within less than a decade, it was clear to the Spanish government that allowing the Dutch to trade with Spain, Portugal, and their overseas possessions was fuelling the rapid and Spain-endangering growth of Dutch power.[111] As such, in 1598, the decision was taken to re-impose the ban on Dutch trade with the Iberian Union: a remarkable early attempt at economic containment. That said, this attempt did not significantly retard the Netherlands' relative rise over the long cycle, given that (a) trade with Spain, Portugal, and the Mediterranean was only one component of

[110] (Israel, 1995, p. 307)
[111] (Israel, 1995, p. 312)

Dutch international commerce, (b) by that point, the Dutch navy and *VOC* were already capable of out-muscling their Portuguese counterparts outside Europe, and (c) by then, the damage had to an extent already been done. Spain lifted the embargo again in 1609, during a warmer period of political relations.[112] The key point, however, is that the precise degree of openness achieved at any given point in this case study's period was partially contingent on political choices, as well as economic flows.

Figure 27. GDP of European Economies, 1990 US$, 1500-1825



Source: Maddison (2003). Data is for contemporary borders of states; hence the 'Germany,' 'UK,' and 'Italy' figures, for example, would actually be shared by the various states that then constituted what became modern Germany, the United Kingdom, and Italy. Data for years other than 1500, 1600, 1700 and 1820 generated by interpolation.

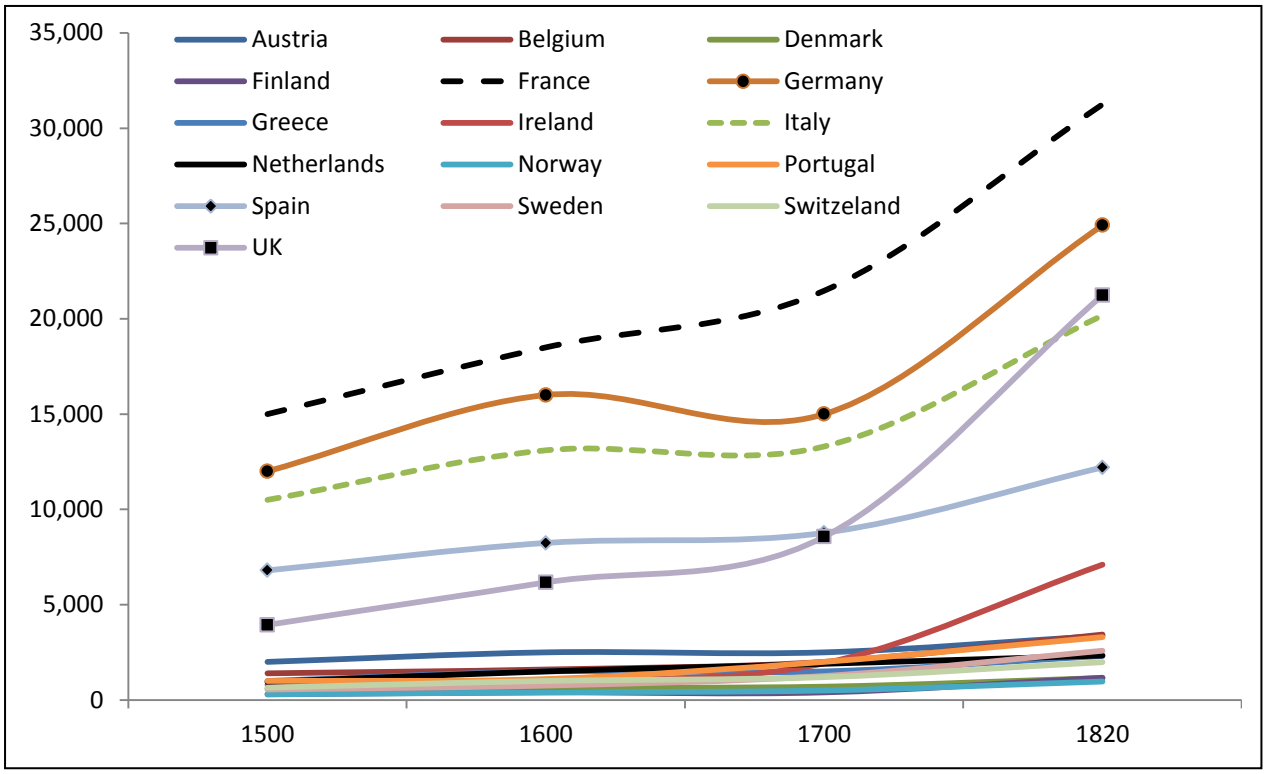
Power and Conflict Caveats

The previous section noted certain caveats and scope conditions to the fit between the dissertation's overall theoretical framework and the economic half of the case study's

[112] (Israel, 1995, p. 313)

evidence base. This section turns to do the same for the outcomes in terms of power shifts and conflict behaviour.

Figure 28. Population of European Economies, thousands at mid-year, 1500-1820



Source: Maddison (2003).

The first salient point is that, as figure 27 makes clear, the Dutch Republic was never close to being Europe's biggest economy in aggregate GDP terms, even at the peak of its relative power.[113] Figure 28, which presents population data for the European economies, sheds light on why this was: even given its order-of-magnitude superior GDP per capita, documented in figure 11, the Netherlands simply did not have enough people to become the largest economy in aggregate terms.[114] Even notwithstanding the problem of using the Maddison data that treats the states in question by their twenty-first century boundaries, therefore, this appears to suggest that the Dutch Republic never had the economic prerequisites of great power status.

[113] (Maddison, 2003b)
[114] (Maddison, 2003b)

Such a perspective, however, would make the mistake of failing to distinguish between aggregate GDP and total wealth that can be mobilised for national strategic ends. The Dutch Republic was an advanced administrative state with unrivalled development levels; it therefore had significant economic output above that required for basic human subsistence, and the state organisational capacity to harness such output, for the generation of sophisticated military forces if necessary. By contrast, states such as France and Spain had a greater total GDP, but that reflects a large population involved in subsistence agriculture over a vast country with poor internal communications relative to the Netherlands, meaning that there was relatively little surplus output beyond that required to feed the population and insufficient administrative capacity for the state to harness more than a small fraction of national output for strategic purposes. Indeed, figure 19 reflects this ability of the Dutch state to support far larger strategic output relative to population compared to the two other principal continental powers, France and Spain. As such, despite the apparent puzzle presented by figure 27, the observed result – Dutch economic and military power despite a small aggregate GDP – is both easy to explain and wholly consistent with the theory.

A second key caveat, albeit a related one that follows a similar vein, relates to the comparatively small size of the Dutch army documented in figure 18. While the Netherlands' army was Western Europe's second largest and close to that of France (with its much larger population) by the 1670s – the zenith of Dutch power – it was significantly smaller than those of Spain, France, and even maritime-focused England between the 1590s and 1650s. Yet the 1590-1660 period takes in the ascent of the Republic from rebel province to victorious great power, and includes the Dutch role in the Thirty Years' War along the way. Does this present a problem for the causal story being told? Again, the answer is no. As noted earlier, what the Dutch military lacked in manpower, it offset in technological and professional sophistication – an edge not lost until the 1670s – while the Dutch role in the Thirty Years' War was as

much about contributing huge quantities of money and arms to allies as it was contributing ground troops. As noted in the previous paragraph, the Netherlands was capital-abundant but labour-scarce, so – just as with twenty-first century Western major powers – a combination of resource-intensive but manpower-efficient forces coupled to extensive material support for relatively less wealthy but more populous allies made good strategic sense. Moreover, unlike Spain, the Dutch Republic did not have vast domestic and Latin American territorial possessions to garrison (the Dutch imperial footprint being confined more to island and coastal trading posts), meaning that there was less need to maintain a large but geographically-dispersed and hard-to-deploy army of comparatively poorly trained and equipped soldiers.

A final caveat that needs to be mentioned at this stage is that none of the conflicts discussed in this chapter qualify as 'pure' security seeking of the kind that neorealist theory takes as its ideal type. The Thirty Years' War was infused with and at least partially caused by religious differences,[115] while the first three Anglo-Dutch wars must all be seen through the mercantilist lens of the maritime competition produced by the commercial rivalry of the two states' merchant classes. That said, however, making this acknowledgement does not reduce the persuasiveness of the overall theory. The run up to the Thirty Years' War displayed security dilemma dynamics between the Dutch Republic and Spain overlain by religious differences, with the Dutch decision to back the Protestant rebels reflecting shared religious identity *and* the rebels' strategic utility as a proxy.[116] Moreover, of course, the distinction between security and religion cannot be neatly drawn; once religious identity is seen as a vital interest, a component of sovereignty, and a part of national identity, it becomes a constituent *of* security. The commercial dimension to the Anglo-Dutch rivalry, for its part, can be explained in a similar way: yes, there were domestic merchant lobbies with sufficient

[115] (Gutmann, Spring 1988)
[116] On the Dutch need for balancing solutions against Spain's power in terms of total ground force size, see (Levy & Thompson, January-March 2005)

political influence for their profit motives to impact on their state's strategic behaviour, but the reason that ostensibly commercial considerations took on first-order strategic salience worthy of major war was that both England and the Netherlands relied on free maritime commerce for their prosperity, and thus their power position, and thus their survival.[117]

International Commerce in the Era of Dutch Decline, 1674-1795

The chapter to date has detailed how international commerce facilitated the rise of the Dutch Republic as a European great power, and how that rise resulted in serious international conflict. However, just like the United Kingdom in the 1870 to 1914 period, and arguably the contemporary United States since the 1990s, the open system of trade, financial flows and technology diffusion that the Dutch had benefitted from and driven was also a key contributor to the Republic's eventual relative demise. The beginnings of this demise can be approximately dated to 1672, the 'Year of Disaster,' when France and England launched their joint attack on the Republic, which – while repulsed by 1674, hence this section's start date – produced an unprecedented crash on the Amsterdam Exchange (see figure 26), saw an end to public building that would have ramifications for years to come, and resulted in a further toxification of domestic political and social life with lasting consequences.[118] And it can be dated as having been fully completed in 1795, when Revolutionary France invaded and set-up the Batavian Republic as a client state[119] – thus effectively ending Dutch sovereignty until 1816 – although in practice the Netherlands was finished as a top-tier European great power by 1713, when it withdrew from the War of the Spanish Succession (1701-14),[120] and as any

[117] (Levy & Ali, 1999, p. 55)
[118] (Israel, 1995, pp. 796-806)
[119] (Israel, 1995, pp. 1122-1130)
[120] (Israel, 1995, p. 975; Roosen, 1987, p. 152)

kind of major power by 1784, when it was crushed by the British in the Fourth Anglo-Dutch War (1780-84).[121]

This section does not go into the same level of detail as the discussion of the Dutch rise, and lacks a systematic breakdown of the trading, financial, and technological dimension of diffusion, at it is not intended to constitute a full test in its own right. Rather, it is simply intended as a corollary to the main discussion above, by illustrating how – just as the Dutch Republic rose – commerce-enabled catch-up growth by less developed economic followers was also instrumental in its relative decline. This section briefly discusses how international economic exchange expanded away from Dutch domination to more fully incorporate other states – in other words, how those states deepened their international economic integration – from the latter years of the Dutch Golden Age. The following section then details the impact of this expanded commerce on the balance of power, and discusses the conflict implications of such shifts.

First, returning to figure 2, the Dutch merchant fleet declined in absolute terms between 1670 and 1770. Even more significantly, it fell from first to fifth in terms of relative standing, as other countries expanded their carrying capacity: a key proxy indicator of other states' deepening their involvement in international trade. The English (and Scottish) fleets, in particular, boomed after 1670, and particularly after the accession of William III of Orange-Nassau to the English throne in 1688 shifted the focus of many merchants from Amsterdam to London. Other indicators also contribute to this picture. Figure 6, for example, makes clear that Dutch trade with the Mediterranean crashed after 1700. The turmoil in Northern European states' trade with Southern Europe caused by the War of Spanish Succession (started in 1701) probably contributed to this demise, but the more significant point is that the Dutch never regained their dominance in this trading sector even after the

[121] (Israel, 1995, p. 1100)

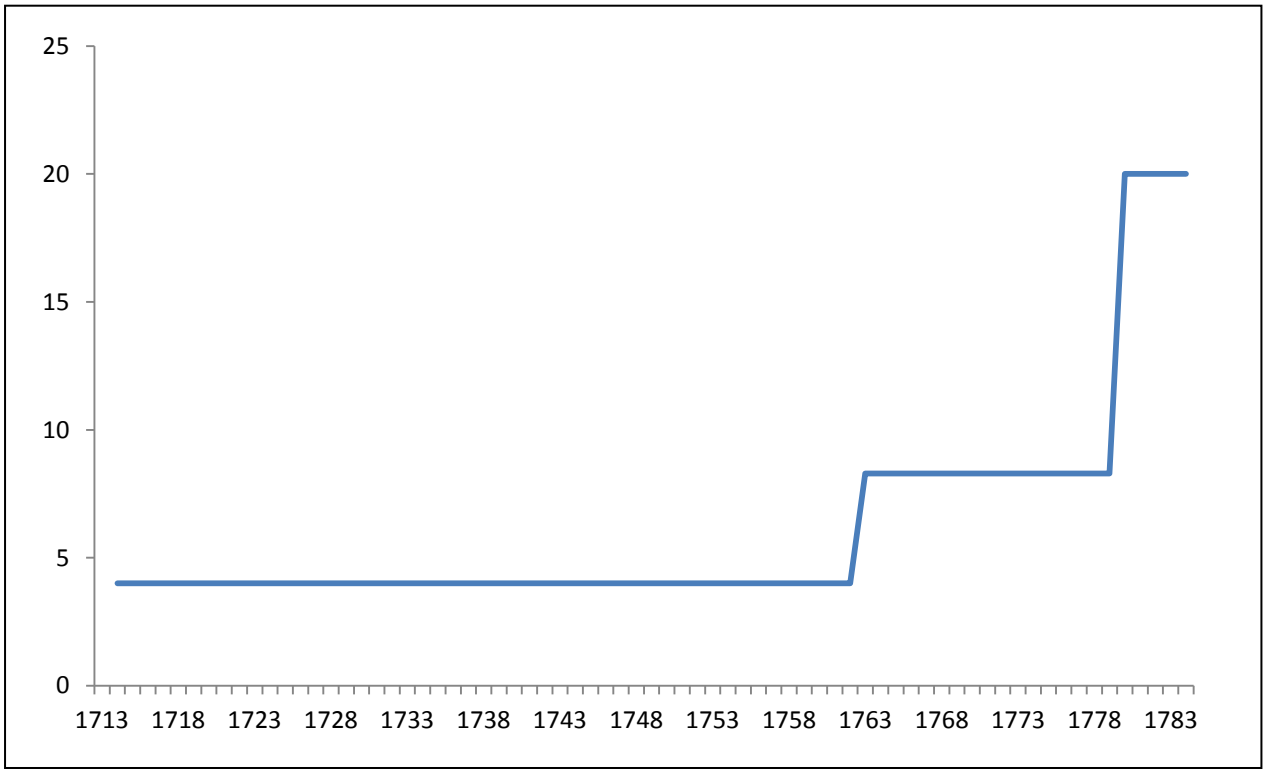
war had finished, as other commercial powers had taken a share of the available cargo. Moreover, in terms of the infrastructure required to support maritime trade, figure 13 shows that by the final decade of the seventeenth century, harbour construction in the Netherlands had fallen to its lowest level since before independence – a further sign that even while the Dutch remained actively involved in international commerce, other actors had become at least as involved, squeezing the Dutch position.

Moving beyond goods trade to other dimensions of international economic openness, there were similarly significant trends in the areas of knowledge diffusion and capital flows. Returning to figure 9, we see that new enrolments at the Netherlands' leading university began to fall from around the middle of the seventeenth century. This would be a concerning enough development in its own right, given that elite research and education are the foundation of development. Yet an even more significant trend than the overall decline in student numbers was the fall in the proportion of the student body represented by foreign students. Whereas Dutch universities had previously attracted Europe's best minds to the Netherlands, they were increasingly going elsewhere – with Oxford and Cambridge in England being obvious alternative destinations. Moreover, in addition to such academic thinkers, many Dutch engineers, artisans, seafarers and other skilled professionals moved abroad throughout the seventeenth century, taking their knowledge with them; indeed, such skill transfer can be seen as a key facilitator of Sweden's emergence as a major power.[122] Accordingly, the infusion of skills, knowledge and talent that had characterised the Dutch Golden Age, particularly in its early years, had been matched by diffusion of such knowledge and talent to other places – most notably England – by the late seventeenth century.[123] Summarising the diffusion of technology from the Italian city states and Antwerp to the Netherlands described earlier in the chapter, but also adding the subsequent shift away from

[122] (Israel, 1995, p. 274)
[123] (van Lottum, 2007, p. 96)

the Dutch to England – and taking in some two-thirds of this dissertation's total empirical sweep – Karel Davids writes that 'Between the Late Middle Ages and the middle of the eighteenth century technological leadership in Europe shifted successively from northern Italy, South Germany and the Southern Netherlands via the Dutch Republic to Britain, where it remained until the end of the Victorian era.'[124]

Figure 29. Average Annual Lending to Foreign Governments on the Dutch Bond Market, million guilders, 1714-1784



Source: de Vries and van der Woude (1997), p. 120.

Finally, Dutch capital flowed overseas, facilitating development in other countries; insofar as some of those states had the potential to overtake the Netherlands in relative power terms, this amounted to the Republic financing its own relative decline. In the words of Jonathan Israel, 'Dutch finance remained a major force in the world for many decades after 1720 but it served to fuel growth and create employment elsewhere, especially but my no

[124] (Davids, 1995, p. 338)

means only, in England, rather than in the Republic.'[125] Amsterdam banks spent the eighteenth century exporting the capital that the Netherlands had accumulated during the seventeenth century, particularly to Britain and to a lesser extent France, perceiving greater opportunities for profit in less developed countries with the potential for catch-up growth, and financial integration deepened further accordingly.[126] Particularly after 1763, Amsterdam achieved its moment as the capital source for all of Europe; by the fall of the Republic in 1795, estimates of total Dutch overseas investment range between 500 million and one billion guilders.[127] Put in context, at its peak, Dutch foreign investment probably amounted to more than double the GNP of the Netherlands; by contrast, imperial Great Britain – often thought of as the paragon of an overseas investor – is estimated to have achieved foreign assets of no more than 1.5 times GNP in 1914.[128] The significant level of lending to foreigners on the Amsterdam markets throughout the seventeenth century, and the particular boom during the Republic's final thirty years, are both indicated by the data on Dutch lending to foreign sovereigns presented in figure 29.[129] Note too here that lending to sovereigns denotes a more extensive relationship than simply the financing of public spending, given that certain institutions that played a pivotal role in Britain's economic rise – such as the Bank of England, the East India Company and, from 1711, the South Sea Company – were incorporated as quasi-state joint stock companies.[130]

[125] (Israel, 1995, p. 1003) See also (Arrighi, May-June 2005, p. 97)
[126] (Lothian, November 2002)
[127] (de Vries & van der Woude, 1997, pp. 142-144)
[128] (de Vries & van der Woude, 1997, p. 146)
[129] (de Vries & van der Woude, 1997, p. 120)
[130] On the significance of this financial revolution – which had both international (for example, Dutch lending) and domestic (for example, the ascent of the Bank of England) dimensions – for the financing of wars, see (Kennedy, 1987, pp. 76-86)

Referring back to figure 11, the impact of these international flows of goods, capital and skills on the growth rates of follower economies is not hard to discern. England, in particular, was the principal winner of expanded international commerce, investment and knowledge sharing, converging swiftly on Dutch development levels to essentially match them by the early nineteenth century – but in relative terms, other significant European powers, such as France, Sweden, and the German states also experienced catch-up growth. And given that the Netherlands had the smallest population of all of the European major powers, relying as it did on its superior development levels for its strategic position, the result of that erosion of the Dutch GDP per capita lead was its aggregate GDP falling further behind that of its principal competitors, as figure 27 made clear. British GDP, by contrast, soared from not much more than half that of France and only slightly ahead of Spain in 1700 to be Europe's largest, ahead of even populous France, by the end of the first quarter of the nineteenth century. The beginnings of this British relative rise were also reflected in that country's economic ability to sustain an even larger share of the population in the armed forces than the Netherlands by the 1700s, as figures 18 and 19 demonstrate. The Dutch relative economic, imperial and thus strategic decline, by contrast, is further reflected in the declining relative profitability of the *VOC*, which fell behind that of the English East India Company in the late seventeenth century (see figure 30),[131] and – with a lag that reflects the Dutch East Indian trade being the last pillar of the Republic's economic base to weaken – in the personnel numbers of the *VOC* (see figure 24).

Remarkably, however, Dutch economic decline was not merely relative, but *absolute* also. Returning to figure 11 again, GDP per capita actually declined steadily from 1700 to the early nineteenth century. The Netherlands was still the richest country in the world (by a

[131] (de Vries, August 2010, p. 723)

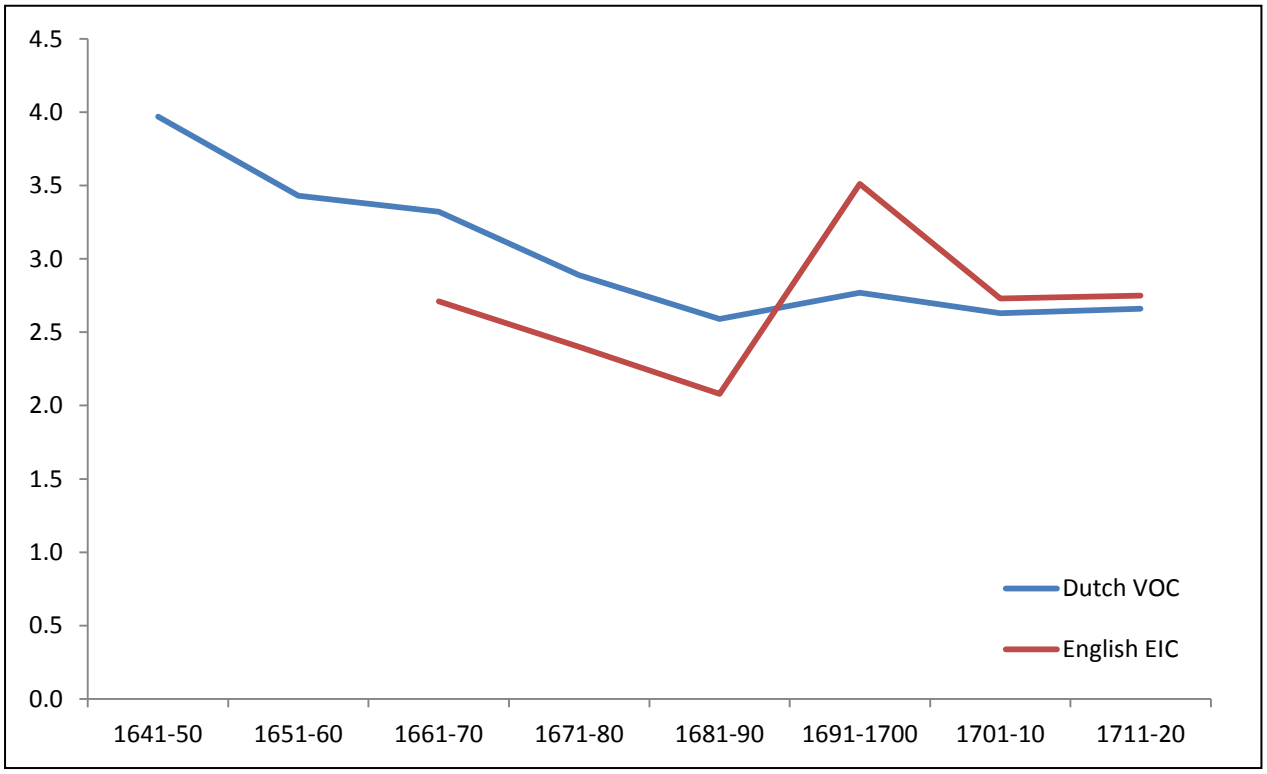
slender margin) on a per capita basis by this latter point, but it is still striking that it was poorer than a century earlier in real terms.[132] The proportions of the Dutch and British populations employed in industry by the mid-eighteenth century were roughly equivalent (with France just behind); the difference is that these shares were going in opposite directions.[133] Moreover, particular sectoral data points reflective of this headline GDP outcome abound. The Dutch textile industry declined from around the middle of the seventeenth century, as figure 31 makes clear, even as England's rose.[134] Referring back to figure 14, the urban population declined for all major cities except Rotterdam and The Hague from between the late seventeenth and early eighteenth centuries. Referring back to figure 12, land reclamation from the sea had fallen to levels last seen around the data of independence a century earlier by the late seventeenth and early eighteenth centuries. And as noted above, not only were fewer *foreign* students travelling to the Netherlands by the eighteenth century, but *domestic* student numbers were down too, reflecting not just a lower influx of foreign talent but also a wider and deeper atrophy in national higher education and research (see figure 9).

The result of this diffusion and economic decline on the respective military and strategic positions of the Netherlands, Britain, France, and other European major powers was predictable. Variations of the professionalism, operating techniques, logistical systems and equipment of the Dutch armed forces were soon copied and refined by rivals. The Swedish military of Gustavus Adolphus became a close copy of the Dutch model (the same was also true, albeit to a lesser extent, in other Protestant states),[135] the French army of 1672 had closed the gap on the Republic that it was about to attack to become Europe's most

[132] Since it remained the richest country in the world on a per capita basis by the early nineteenth century, the statement that the Netherlands underwent 'absolute decline' is of course contestable; after all, the Dutch had reaped vast development gains in the seventeenth century, the benefits of which endure with the country to the present day: (Lucassen, 1995, p. 367) As such, the term is used here not in a pejorative way, but simply to indicate that GDP per capita declined slightly in real terms over a period of time longer than multiple business cycles; something that did not happen in other major European states.
[133] (Gutmann, 1988, p. 119)
[134] (de Vries & van der Woude, 1997, p. 286; Gutmann, 1988, pp. 85-89)
[135] (Israel, 1995, p. 270)

capable,[136] and Britain's Royal Navy moved towards the more meritocratic leadership selection system, discipline, supply, and regular drilling that had made the Dutch Navy so capable.[137] Given its small population and subsequent scarcity of potential personnel, Dutch military power had always been based on the combination of superior proficiency and superior materiel made possible by abundant resources. As the economic development lead began to erode, therefore, so too did the potential to compete militarily with more populous states, and its armed forces – both land and naval – subsequently fell behind those of the larger European powers. Naturally, a further negative corollary of this was mounting fiscal strain on the Republic, discussed in greater detail below, as it strove to maintain sufficient military forces to protect its interests even in the face of economic contraction.

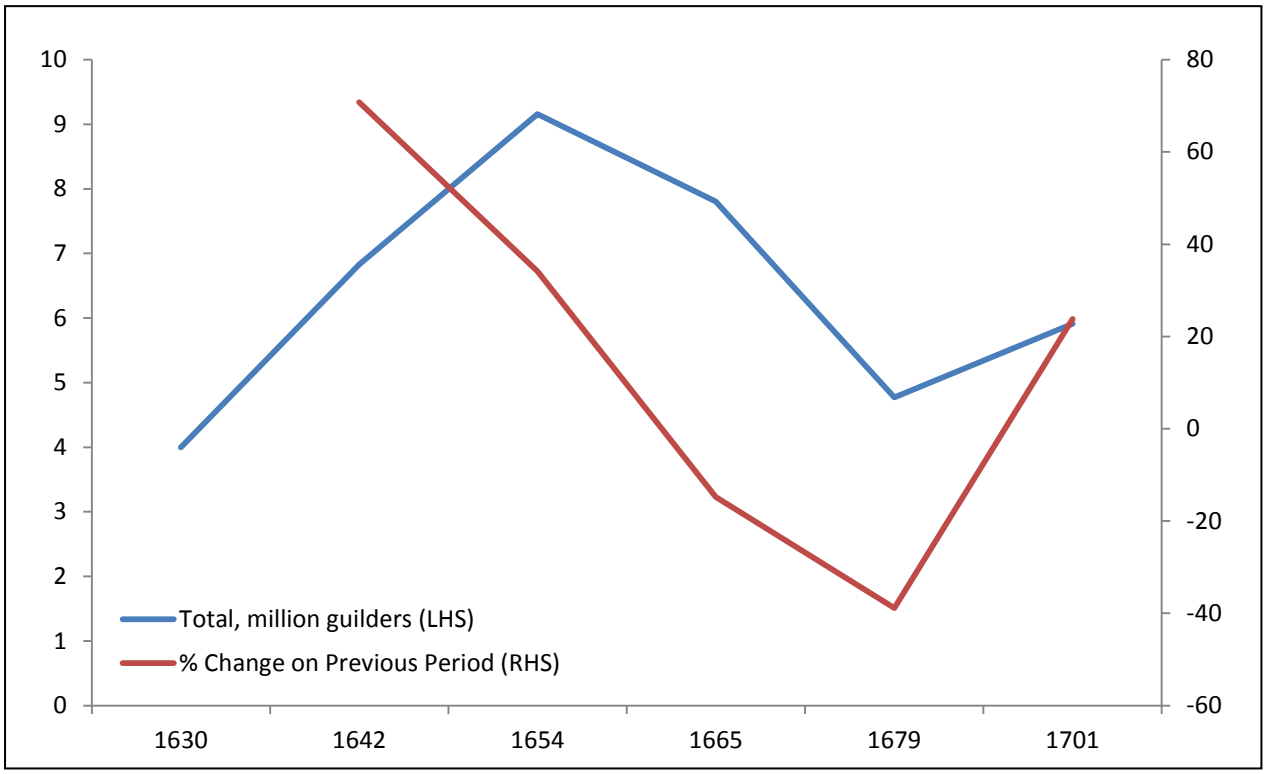
Figure 30. Dutch and British East India Companies' (*VOC* and EIC) Respective Performance, ratio of sales price in Europe to purchase price in Asia, 1641-1720



Source: de Vries (2010), p. 723.

[136] (Israel, 1995, p. 796)
[137] (Kennedy, 1976 [2004]; Rodger, 2004, pp. 37-122)

Figure 31. Leiden Woollen Cloth Production by Value, million guilders, 1630-1701



Source: de Vries and van der Woude (1997), p. 286.

What result did these shifts have on the Dutch strategic position? Even by 1672, at the tail of the Golden Age, Dutch ground forces found themselves lacking the numbers, proficiency, and resources to rebuff the French invasion, and only strong leadership and professional excellence at sea prevented naval defeat, thereby freeing sailors and marines for land garrison duty.[138] By the War of the Spanish Succession, Dutch relative decline was visibly manifested during the alliance with England,[139] as the latter contributed more troops and more money to the war effort.[140] This 'junior partner' status was manifested by the subordination of Dutch forces to the (English) Duke of Marlborough as joint commander in the Low Countries, and by the English retention of certain key strategic assets seized during the war, most notably Gibraltar and Minorca.[141] A final telling point from this particular

[138] (Israel, 1995, pp. 796-798)
[139] (Roosen, 1987, p. 152)
[140] (Israel, 1995, p. 971)
[141] (Israel, 1995, p. 972)

campaign is that, after the English made peace with France, the Republic briefly attempted to sustain its side of the conflict but found itself lacking both the forces and the funds.[142]

The last major Dutch independent military campaign before its effective loss of sovereignty in 1795 was the Fourth Anglo-Dutch War of 1780-84, in which the British sought to stop the Dutch trading with Britain's enemies during the American War of Independence. This campaign reflected just how far the Netherlands had fallen militarily, being only a shadow of its former self. Whereas the previous three Anglo-Dutch wars had been contests of approximate peers, albeit with each side in better shape than the other at different times, the late eighteenth century clash was clearly a conflict between a top-tier great power and a minor power. The Dutch navy was run-down and neglected, while colonial possessions were inadequately garrisoned and fortified.[143] The result was a decisive British strategic victory – although the principal fleet action, the 1781 Battle of Dogger Bank, was tactically indecisive – confirming that England's commerce-enabled relative economic rise and Dutch economic decline had fed through to the military side and pushed the latter out of the great power tier.

Building off this latter point, meanwhile, and looking to the wider context, Britain rose – via catch-up to Dutch development levels from the late seventeenth century – to a position where its smaller population vis-à-vis France was offset by superior GDP per capita to the point where those two had approximately equal GDP and represented the world's two principal military powers at the end of the eighteenth century. Meanwhile, the decline of the Dutch in the face of French growth that was less stellar than England's but still superior to the Republic's (and building on a large base) – coupled to the size of France's population, division among the Germanic states, and atrophy and inefficiency in an economically backwards Spain – left France, for its part, as the pre-eminent power in a continental Western

[142] (Israel, 1995, p. 975)
[143] (Israel, 1995, p. 1100)

Europe characterised by unbalanced multipolarity.[144] In short, commerce-enabled catch-up growth based on an expansion of trade and the diffusion of capital and technology away from the Dutch Republic did not just bring about the decline of the Netherlands, it also created the structural conditions that paved the way for the next pan-European great power conflagration: the French Revolutionary and Napoleonic Wars. And the absence of a significant bulwark in the Low Countries – a role that the Dutch Republic had been capable of playing during its Golden Age as a great power, but no longer filled as the minor power client state Batavian Republic – particularly facilitated France's eventual offensives to the north and east.

Caveating and Contextualising the Argument, 1674-1795

Just as with the earlier discussion about the pre-1674 period of Dutch rise, the post-1674 'rise of the rest' period also requires a degree of caveating and contextualisation. That is the purpose of this final section.

First, just as in the era of Dutch ascendancy, trade patterns in the era of Dutch decline and British ascendancy were heavily endogenous on states' power positions; that is, expanded trade for others coupled to a declining trade share for the Netherlands was both a cause *and* a consequence of shifting power balances. The original economic rise of the Republic was fuelled by an expansion of international trade, but it used the power increments that it gained to squeeze out weaker prior competitors – most notably the Portuguese – thereby securing greater market share, producing a virtuous (from the Dutch perspective) self-reinforcing cycle. Yet just as the Dutch had squeezed the Portuguese out, so too the Dutch were in turn squeezed out by the British and others, who – like the Dutch had before them – used their trade to generate power and their power to secure trade: a mercantilist

[144] As figure 18 makes clear, looking beyond Western Europe, Russia also belatedly began the modernisation process necessary to harness some of its large population as military power from the eighteenth century.

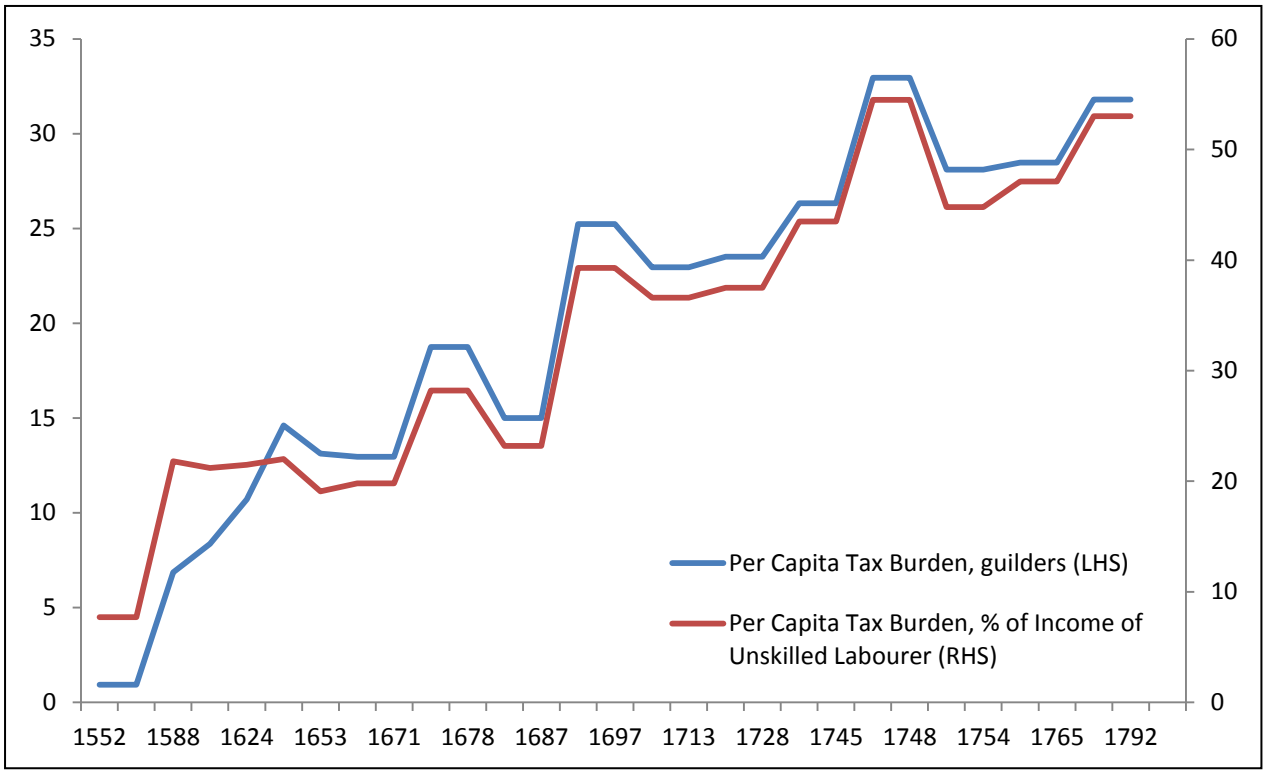
policy with a compelling underlying economic logic.[145] The Dutch move to become the 'bankers of Europe' in the eighteenth century, particularly after the 1740s, can be seen in the context of this pressured retrenchment from trade.[146] The eighteenth century expansion of the British East India Company and its forceful state-backed imperialism, the restoration of Britain's leading trading position in Europe, and the rise of the Royal Navy to a point of global pre-eminence that – while periodically challenged – it would retain for two centuries were all intimately connected. Indeed, the English re-establishment of a leading trading position in Europe in the eighteenth century can be seen in some ways as a return to the *status quo ante* before the Dutch squeezed them out a century earlier. This acknowledgement does not present a major problem for the theoretical story – that trade was contributing to relative power shifts is demonstrated by the evidence – but it is worth recognising the circular relationship between trade growth, economic growth, and military power growth.

Second, a key puzzle presented by the discussion of the Netherlands' demise is that economic decline was not simply relative – as would be expected in a 'pure' catch-up growth story – but, rather, Dutch economic decline was absolute from 1700 until the nineteenth century. As such, economic openness-induced convergence dynamics cannot account for the whole story, and the deterioration of the *domestic* political and economic climate must also be seen as playing a pivotal role. Such deterioration had numerous causes. The logical corollary to the vast flows of Dutch capital overseas seen during the eighteenth century was less capital available for investment within the Netherlands, leading to domestic industrial atrophy.[147] The decline of elite university attendance from the late seventeenth century has already been discussed above. Britain, by contrast, had a unique confluence of scientists and engineers with entrepreneurs and financiers that goes much of the way to explain why the

[145] (Irwin, December 1991)
[146] (Arrighi, May-June 2005, p. 86)
[147] (Israel, 1995, p. 1003)

Industrial Revolution ultimately began in the United Kingdom, rather than the Netherlands, despite the latter's superior development levels at the start of the eighteenth century.[148]

Figure 32. Per Capita Tax Burden in Holland, 1552-1792



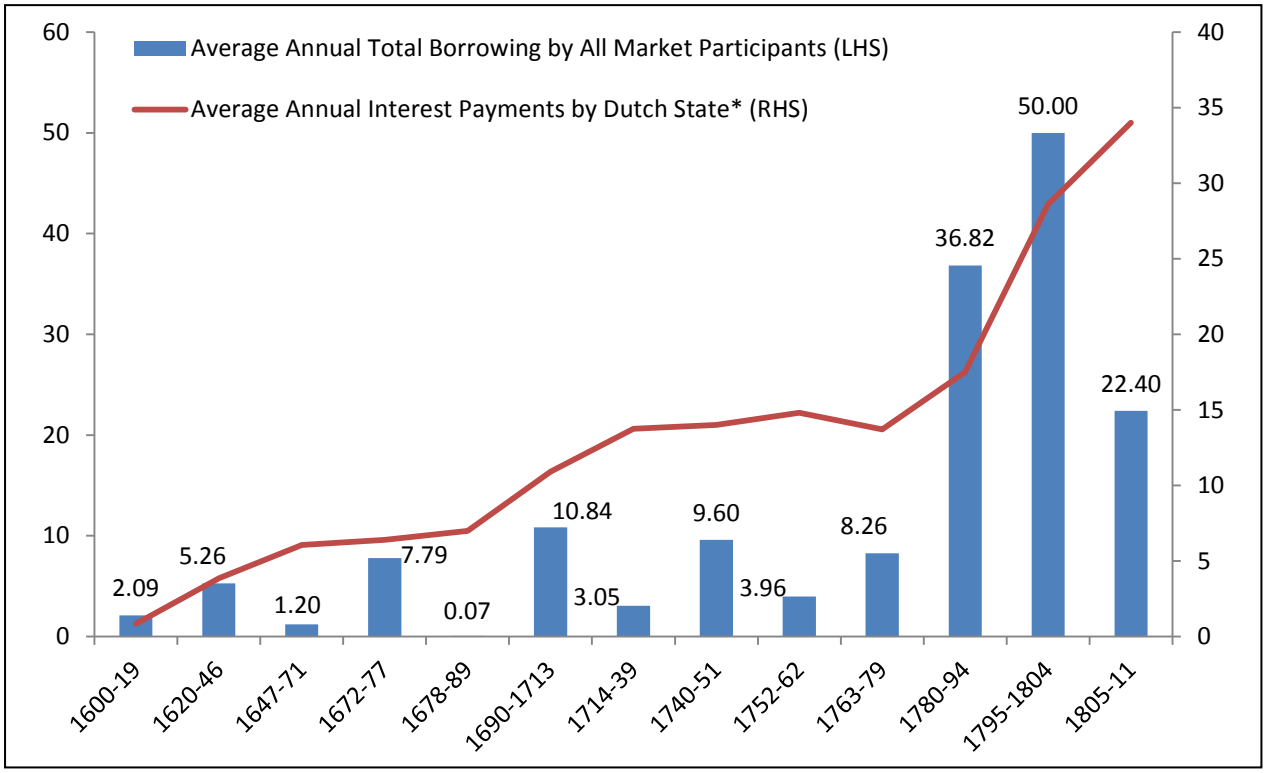
Source: de Vries and van der Woude (1997), p. 97.

Perhaps most important of all, however, was the fiscal overstretch that arose from the political pressures on the Republic, both domestic and international. As noted earlier, and following the familiar pattern of great power overstretch identified by Kennedy,[149] Dutch attempts to sustain arms expenditure sufficient to maintain the Netherlands' military position in the face of rising challengers and an eroding economic lead produced a spiral of government borrowing, as well as pulling available public funds away from infrastructure and public building. Attempting to maintain great power status in a small country using the sort of troop/population ratio displayed in figure 19 necessitated lavish spending, including

[148] (Mokyr, October 2000)
[149] (Kennedy, 1987)

on mercenaries; spending that by the eighteenth century could only be financed by an expansion of public debt. The surge in borrowing necessitated by Dutch efforts to punch at the weight of a great power during the War of the Spanish Succession represented a particular spike within a more general upwards trend.[150] Meanwhile, the breakdown of domestic political relations – always prone to discord[151] – into factional polarisation from 1672 made the sort of widespread national consensus that could have helped to adequately address the Republic's fiscal overstretch unattainable.

Figure 33. Total Borrowing on the Dutch Bond Market, million guilders, 1600-1811



Source: de Vries and van der Woude (1997), p. 120. *This data is for Holland only from 1600 to 1794, and for the Generality as a whole from 1795 to 1811.

The effects of this fiscal stretch on the per capita tax burden of Dutch labourers are made clear by figure 32.[152] Total taxation as a proportion of an unskilled labourer's wage rose from around 20 percent in the mid-seventeenth century to above 50 percent by the mid-

[150] (Israel, 1995, p. 971)
[151] (Prak, 2005, p. 3)
[152] (de Vries & van der Woude, 1997, p. 97)

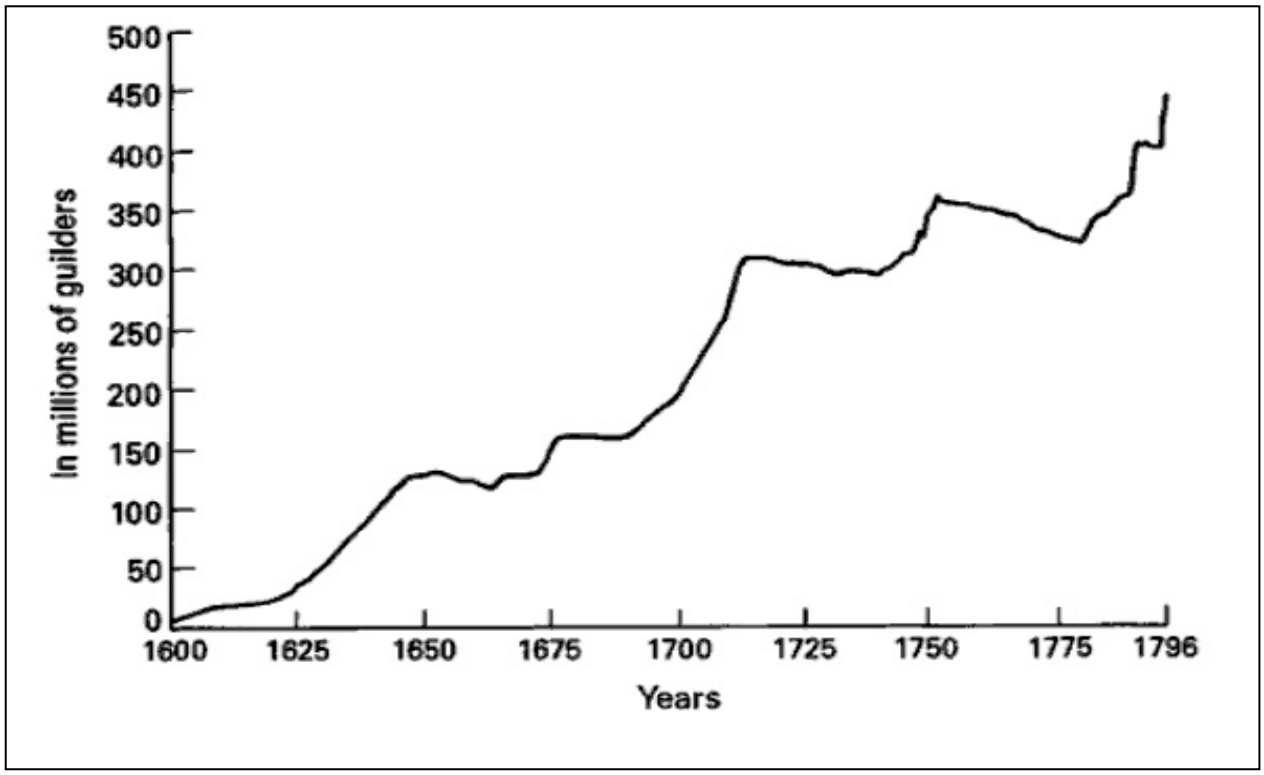
eighteenth century – a level sure to crowd out consumption, saving, and private investment. In the face of such a crushing tax burden, it is unsurprising that economic dynamism and domestic growth disappeared. By the same token, however, a case can be made that the tax burden did not actually rise *enough*, given national spending aspirations. Figure 33 demonstrates that total borrowing on the Dutch bond market, and the corresponding interest paid by the Dutch state, took a significant step up in the late seventeenth century and then soared in late eighteenth.[153] Finally, while the ability to generate additional government spending leeway via the bond market during times of crisis was an innovative source of Dutch relative strength during the Golden Age,[154] figure 34 demonstrates the negative effect that the long-term expansion of borrowing had on the public debt position of Holland – the largest and most economically significant of the United Provinces – between the Republic's beginnings as a major power in 1600 and the effective end of Dutch sovereignty in 1795.[155]

Conclusion

As noted at the outset, this case merits careful caveating: the early modern European economy was different in important ways from the liberal capitalist system that it evolved into, just as the European international system was not composed of the administratively-developed unitary nation-states that it is today.[156] Nonetheless, the 1581-1795 period of European history – which divides in practice into two distinct periods, the former of remarkable Dutch relative ascent (1581-1674) and the latter of English (and later French) relative ascent and Dutch relative decline (1674-1795) – provides support to this dissertation's overall theoretical argument.

[153] (de Vries & van der Woude, 1997, p. 120)
[154] (Hart, 1997, p. 17)
[155] (Hart, 1997, p. 21)
[156] Indeed, there is a case to suggest that given the Dutch Republics superior administrative capacity and republican constitution, it was a different form of state entity to, say, the Hapsburg empire, meaning that – at least pre-1648 – this was not a period of international unit homogeneity. On evolution and variation in state types, and the potential for unit heterogeneity in such types at a given period, see (Lake, 2008)

Figure 34. Public Debt of Holland, million guilders, 1600-1796



Source: Hart (1997), p. 21. Note that this chart was extracted directly from the original publication, rather than being re-plotted, as I was unable to access the underlying data; Hart (1997) therefore retains image copyright.

From around the time of Dutch independence in 1581, international economic integration – as measured by goods trade, capital flows, and technology and labour diffusion – expanded. This produced dynamic differential economic growth, with the Republic the principal beneficiary of flows from the more developed still-Habsburg Southern Netherlands (particularly Antwerp and Liége), Italy, Asia, and elsewhere. Differential growth, in turn, shifted the balance of power: the United Provinces went from being a weak and vulnerable territory in the late sixteenth century to one of Europe's foremost great powers – and by far the region's most advanced economy – by the middle of the seventeenth century. Viewed in polarity terms, Western Europe went from the rough bipolarity of the Habsburg bloc and France on the continent, and the rough bipolarity of Spain and England in the maritime sphere, to multipolarity in both domains (although the Spanish navy later declined as a significant force). And viewed in dynamic differentials terms, Dutch relative rise put the

Catholic powers – most crucially Spain – on land and England in the maritime sphere in relative decline, threatening their interests and giving them incentives to contain and retard the young Republic: witness the Spanish trade embargoes, Spanish encircling garrisons, and English Navigation Acts and naval harassment of Dutch merchant ships all noted earlier. The Dutch, for their part, reacted to this incentive structure on the part of others by seeking ways to balance and weaken their rivals, in line with security dilemma theory – including supporting Protestant rebels against Spain in Germany and strategically crowding-out the English merchant fleet at sea.

The consequences of this interaction included Europe's first region-wide great power conflict, the Thirty Years' War (which also saw fighting outside Europe, giving it a global dimension), and a twenty-two-year period of intense and periodically violent naval competition between the world's two principal maritime powers.[157] As such, while this period must be seen as one of mercantilism rather than free-flowing liberal commercial exchange, it fits wholly with the dissertation's theory in terms of its substantive causal mechanisms (independent variable) and observed outcomes (dependent variable).

Turning to the post-1674 period, while this was not the chapter's principal focus, the evidence is again supportive of the dissertation's theory. Following a pattern that would be familiar to both Karl Marx and Paul Kennedy alike, the Republic's earlier commercial success and subsequent military expansion also created the conditions for its eventual demise. From the late seventeenth century, and especially in the eighteenth century, the deepening integration of other powers into the hitherto Dutch-dominated international trading system – most notably a modernising England after the 1688 Glorious Revolution and subsequent 1689 Bill of Rights – was accompanied by booming flows of capital, technology, and skilled labour *away* from the Netherlands. This produced catch-up growth in follower economies,

[157] That is, the first three Anglo-Dutch wars (1652-54, 1665-67, 1672-74).

which in turn produced a shift in the balance of power, with Britain ascendant relative to France, and the Netherlands and Spain in decline relative to both of them (and, indeed, relative even to then-second-tier powers, such as Sweden). Faced with an eroding economic development lead and small population, public spending – most notably on the military forces required by the Republic's effort to remain a major power and defend its interests in the face of others' rise – could only be maintained through mounting taxation and borrowing, both of which added to the economic burden and compounded relative decline.

In polarity terms, the impact of Dutch decline was particularly significant: the demise of what had once been a top-tier great power to France's north-east – along with the weakness of Spain to its south-west – left continental Europe in a situation of unbalanced multipolarity, with France subsequently free to make its bid for regional hegemony, a bid only eventually thwarted by the economic and naval strength of Britain combined with the manpower, climate, and geographical scale of Russia. In security dilemma terms, meanwhile, the most significant dynamic was between France and Britain, with the ascent of the latter the corollary of Dutch decline and the product of the trade, finance, and skills flows noted above. Indeed, the defeat inflicted on the Dutch navy and merchant marine during the Fourth Anglo-Dutch War represented the final termination of the maritime strength of a long-declining power by an ascendant power, with Britain finally sealing its dominance over the seaborne trading sphere that was the source of its prosperity and power, and that the two had clashed over repeatedly as peers in the previous century.

In short, the early modern European experience – including the lead up to its two most significant wars, the Thirty Years' War and the wars of Revolutionary and Napoleonic France – is supportive of integration-convergence conflict theory. Deepening international economic integration in both halves of the period caused differential growth, which shifted the balance of power, which resulted in major power conflict. Indeed, taken together, most significant

European international conflicts of the seventeenth and eighteenth centuries involved the conflict incentives brought about by shifting balances of economic and associated military power – shifts that trade, financial flows, and technology and labour diffusion played key roles in causing – and the Dutch, initially the principal beneficiaries and later among the principal victims of such shifts, participated in all of them (see figure 35).[158]

Figure 35. Dutch Involvement in European Military Conflicts, 1560s-1815

Wars to Establish and Safeguard Independence from Spain	Wars of Economic Interest and Maritime Power with England/Great Britain	Wars over Continental European Balance of Power, Territory, and Religion
1560s-1609 1621-48 *(1560s-1648 in Total: Eighty Years' War)*	1652-54 1665-67 1672-74 *(also versus France)* 1770-73/74 *(Ceasefire in 1773; Peace Treaty in 1774)*	1618-48: Thirty Years' War 1688-97: War of the League of Augsburg (Nine Years' War) 1701-13: War of the Spanish Succession 1756-63: Seven Years' War 1795-1815: Revolutionary and Napoleonic Wars *(as French Client State)*

Source: Maddison (2003), with supplementation.

Why is the supportiveness of this case particularly significant for the theory? First, it represents the beginning of the modern European economy and the forerunner to the industrial revolution. Second, it represents the period of the birth of the modern states system. Third, it incorporates the first pan-systemic European war with global manifestations, the Thirty Years' War. Fourth, it represents a key early instance of differential national wealth producing differentials in military power. Fifth, while a mercantilist era rather a liberal market one, it nonetheless saw a booming of the substantive flows associated with international economic integration – goods, capital, and knowledge – and thus qualifies as an important early period of deepening economic globalization. As such, it is a hard test of the

[158] (Maddison, 2003a)

theory: both the economy and the international system had certain significantly different characteristics compared to today, meaning that the theory's applicability even in this case demonstrates its wide explanatory scope. And it is also a crucial test of the theory: by connecting the international commercial boom that drove and accompanied the Dutch Golden Age to the Thirty Years' War, and the subsequent further expansion of international economic exchange that drove and accompanied the Netherlands' relative decline and England's relative rise to the Revolutionary and Napoleonic wars, the theory can claim applicability to the first two pan-systemic conflagrations of the modern Euro-Atlantic international system. The next chapter turns to a case that is not as hard, but even more significant: the 'poster child' case for the theory; namely, 1870-1914 and the origins of World War I.

VI. 1870-1914: A Clear-Cut Case?
The 'First Wave' of Globalization, Power Shifts, and the Wars of 1905 and 1914

This chapter analyses evidence from 1870 to 1914, a period that economic historians routinely refer to as the 'first wave' of globalization.[1] This 44-year period – marked shortly after its starting point by the unification of Germany and at its close by the outbreak of World War I – saw economic integration deepen to levels that were at the time unprecedented, and that were re-attained again only in the late twentieth century. Moreover, the shifts in the balance of economic power that occurred during this period were of great magnitude and profound importance: with the possible exception of the rise of China between 1978 and the present day, there has been nothing else like it before or after. This chapter will show that the fact of integration and the fact of power shifts during the 1870-1914 period were causally related. As the economic theory presented earlier demonstrated, rapid catch-up growth is made possible by international trade in goods and services, cross-border investment flows, and technology sharing. All three of these mechanisms underwent dramatic expansion between 1870 and 1914 – and sure enough, the less-developed follower economies of the time made spectacular convergence gains on the leading economies as a consequence. These shifts in the economic balance of power were, in turn, of profound geopolitical and strategic importance – so much so that two major power wars of the period, the 1904-1905 Russo-Japanese War and the 1914-1918 Great War, would have been unlikely to have occurred in their absence. Economic integration, and the power shifts that it produced, can thus be considered a necessary condition of instability in this case. Furthermore, insofar as World War II can be thought of an extension of World War I – the political settlement of 1918-19 paving the way for the events of the 1930s – the case demonstrates that the theory has at least extended relevance to *both* of the early twentieth century's principal systemic conflicts.

[1] (Bordo, January 2002, p. 21; Clark, 1997, pp. 16-51; Jacks, Meissner, & Novy, April 2010)

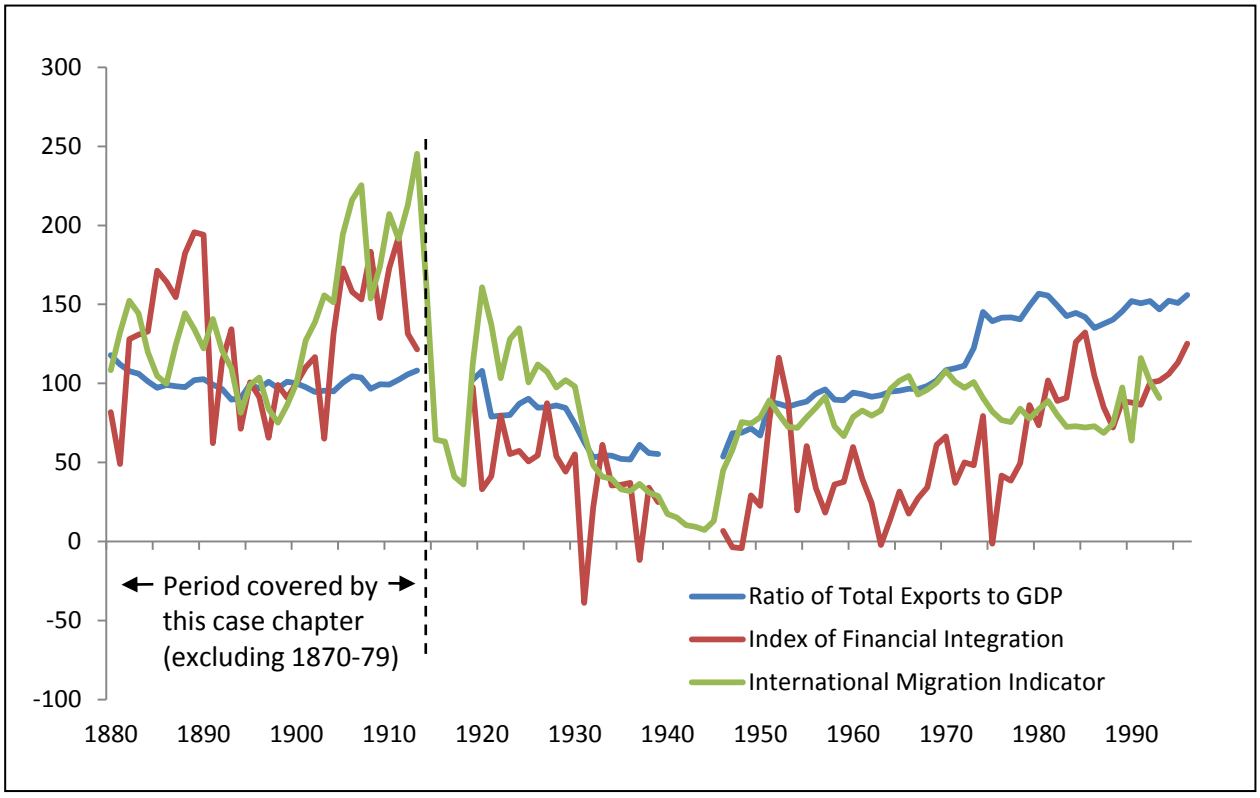
Why choose 1870-1914 as a case study? After all, many of the trade-, capital-, labour- and knowledge-integrating trends described here had their origins earlier in the nineteenth century, and the diffusion of the industrial revolution away from its origins in the United Kingdom was already well underway by 1870.[2] Part of this case's salience therefore undoubtedly owes to crucial *geopolitical* events, with the Unification of Germany being completed in 1871 and World War I breaking out in 1914: and as a crucial case, such (partial) selection on the dependent variable can be justified. However, more importantly, 1870-1914 is an *economically* significant, relatively well-defined period, and is widely accepted as such by economic historians, due to a number of crucial dynamics.[3]

First, and most obviously, trade openness, capital flows and human migration all achieved levels that were both previously unprecedented level and not matched again for at least sixty years. As figure 1 shows, the global ratio of trade to GDP did not return to comparable levels until the 1970s, while financial integration and labour mobility had not returned to their 1880-1913 highs as of 1996 (1870-79 was unfortunately not included in this data series).[4] Second, 1870-1914 witnessed the integration of the United States and Germany, and to a lesser extent Russia and Japan, into the previously UK-led international commercial order, meaning that *all* of the major powers globally were truly connected for the first time. Third, technology and information sharing achieved unprecedented levels between 1870 and 1913; if technology trickled-down earlier in the nineteenth century, then it had flooded outwards by 1913, with such innovations as the steam ship and submarine telegraphy playing key roles. Fourth, domestic politics had moved to favour deeper economic integration; the United Kingdom's iconic 1846 repeal of the Corn Laws was mirrored (although never as fully) in other major economies, meaning that – with some major caveats discussed later –

[2] (Daudin, Morys, & O'Rourke, 2010, p. 6)
[3] See, for example, (Daudin et al., 2010, p. 6; Findlay & O'Rourke, 2007b, pp. 378-428; Jacks et al., April 2010; O'Rourke & Williamson, 1999, p. 2)
[4] (Flandreau, Flores, Jobst, & Khoudour-Casteras, 2010)

salient international actors were sympathetic to the idea of an open commercial order. Fifth, with more than a trace of irony, peace between the major powers during this period served as a key permissive condition for deeper economic integration. In short, while there is an element of needing to choose a convenient line as a starting point, 1870-1914 as a distinct period is nonetheless vital for this dissertation to consider, due to its combination of economic integration levels, aggregate economic shifts, *and* geopolitical outcomes.

Figure 1. Three Indexed Measures of International Economic Openness, 1900=100



Source: Flandreau, Flores, Jobst, and Khoudour-Casteras (2010), Figure 4.3 (p. 100). I thank Marc Flandreau and Clemens Jobst for generously sharing this data with me. Note here that financial integration is measured using Feldstein-Horioka estimators of current account disconnectedness, while labour market integration is measured by dividing migratory turnover by population; the trade openness metric is self-explanatory.

The chapter proceeds in four parts. First, it presents and discusses evidence of all three types of economic integration – trade, financial flows, and information exchange. In this section, I demonstrate how economic interconnectedness within the Euro-Atlantic region achieved unprecedented levels, and in particular, how a number of major follower economies

– such as the United States, Germany, Russia and Japan – integrated into an international commercial order that had previously been the preserve of the United Kingdom, and to a lesser extent, France. Next, the chapter discusses the impact of integration on differing national development patterns and growth rates, via the expanded capital stock and improved national technological base that it generated, and the knock-on impact on the overall balance of economic power. I present evidence illustrating Germany's overtaking of the United Kingdom and eclipsing of France to become Europe's principal industrial power – a shift made possible by the integration-convergence mechanisms detailed previously. I also detail a number of other salient dynamics, including the widening global industrial lead of the United States, the (qualified) economic rise of Russia, and the beginnings of the rise of Japan. Third, the wider impact of these shifts on major power relations is discussed, with a focus on how the military balance was changed and major power relations affected. I briefly analyse the tensions generated between the Russian and Japanese empires in Northeast Asia in 1903-5, before turning to consider the crux of the chapter: how economic integration-driven shifts in the European balance of power contributed to the causation of one of the most devastating interstate conflicts of all time, World War I. Finally, before concluding, I outline some caveats to the chapter's general findings.

Given the confluence of hypothesised independent and dependent variables, 1870-1914 represents an easy case – even a 'poster child' – for my theory, meaning that it is perhaps best considered an illustration of the mechanisms at work, rather than a hard test. However, as mentioned above, it also represents a crucial case, given the depth of the integration that it witnessed and the devastating world war that it culminated with. Moreover, given that this dissertation is simply making a probabilistic argument about what economic integration *can* do to major power relations, rather than a deterministic argument about what it *will* do, exploring such an easy-but-crucial case is all the more important. Accordingly, this

chapter's demonstration of congruence – economic integration followed by major power conflict, with catch-up growth intervening – and attempts at process-tracing to establish the causal linkage between the independent, intervening and dependent variables make it an important test for the dissertation's theory.

It should also be stressed at this stage that this chapter is only attempting to make a qualified contribution to the economic history or geopolitical history of the period under examination. The causes of World War I have been a singular focus for diplomatic and military historians over the years, while economic historians, for their part, have done extensive work documenting and analysing the economic dynamics of the era. Fortunately, however, all that this case study needs to do is fuse the best of the economic research and war-causation research on the 1870-1914 period into a narrative that illustrates how the dissertation's theoretical framework is supported by the data. This does not mean that the nuances of history can be disregarded, so as to 'shoe-horn' the case into fitting the argument. But it does mean that the key focus of the chapter can be on considering how the wealth of available data supports IR theory, rather than on finding new data that makes a contribution to economic-, diplomatic- or military-historical understandings of the period. It is this task that I turn to below.

Evidence of Economic Integration

As detailed in the theoretical section, economic integration is manifested via three principal mechanisms: international trade, international investment, and international technology and information sharing. This section presents evidence on how each of these mechanisms in turn was substantially expanded in the 1870-1914 period, relative to the periods that immediately preceded 1870 and followed 1914. It also includes a fourth section, which lays out other forms of proxy evidence of integration; that is, evidence that does not

directly pertain to the three catch-up mechanisms focused on by my theory, but which nevertheless provides evidence that substantial international economic integration was going on at this time.

Figure 2. Trade Openness in Western Europe, 1850-2000, %

Source: Carreras and Tafunell (2008), Chart 16 (p. 39). Trade openness here represents exports plus imports, as a percentage of GDP. Data is for sixteen Western European economies. Note that this chart is extracted directly from the original publication, rather than being self-plotted, as I was unable to access the underlying data; Carreras and Tafunell (2008) therefore retain image copyright.

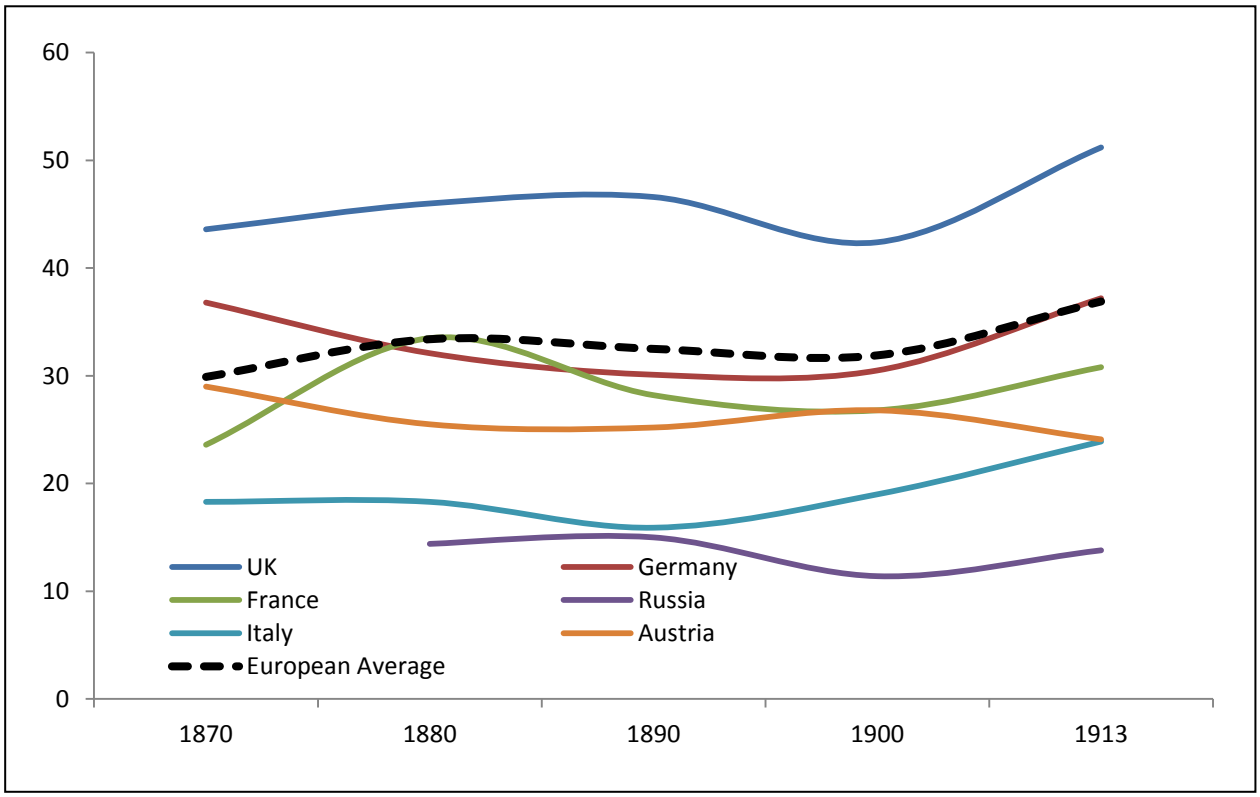
International Trade, 1870-1914

Trade openness increased to new heights throughout the 1870-1914 period, albeit with cyclical ups and downs across the 44 years. As figure 2 demonstrates, within Western Europe – by far and away the leading industrial region of the globe throughout this period – total trade (exports plus imports) as a proportion of GDP increased from around 27 percent in 1870 to a high of over 40 percent on the eve of World War I.[5] As mentioned above, this was a level not to be surpassed until the mid-1970s – an all the more striking fact when the freight transport innovations that characterised the 1914-1973 period are considered, such as the intermodal shipping container.

[5] (Carreras & Tafunell, June 2008, p. 39) Note, however, that the opening did begin earlier than 1870, given that the trade to GDP figure stood at only around 17 percent in 1850.

To be sure, there remained striking disparities between the relative export orientation of the different European major powers. Russia, a relatively undeveloped economy still dominated by peasant agriculture, trailed the rest of the comparatively more developed European powers for the duration of the period, while not one of the other powers' *end*-of-period trade openness level matched the United Kingdom's *start*-of-period level.[6] Nonetheless, as figure 3 illustrates, the end-of-period trade-to-GDP ratio was higher than the start-of-period ratio for every European power, with the exceptions of Austria (Hungarian trade openness did increase, however) and Russia.

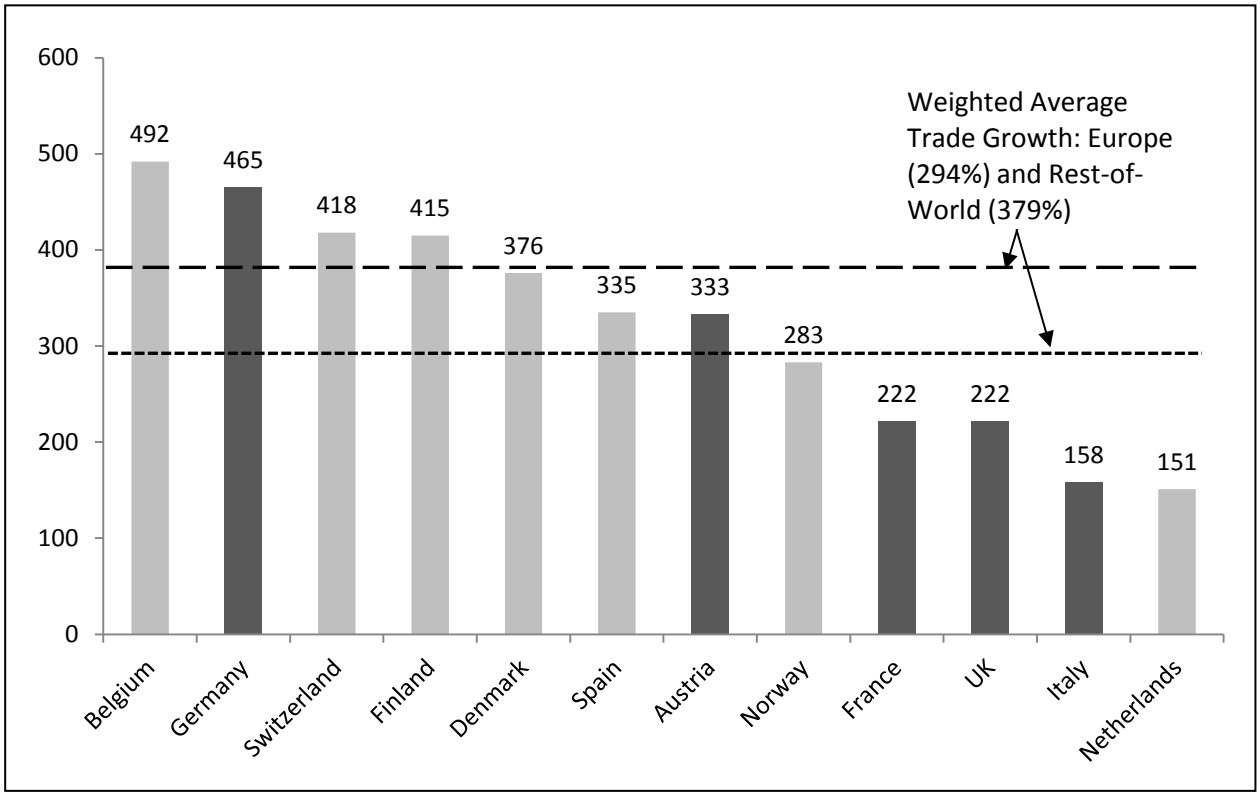
Figure 3. European Powers' Exports plus Imports, % of GDP



Source: Daudin, Morys, and O'Rourke (2010), Table 1.2 (p. 8).

[6] (Daudin et al., 2010, p. 8)

Figure 4. Western European Real Trade Growth, 1870-1913, %



Source: Daudin, Morys, and O'Rourke (2010), Table 1.1 (p. 7). I thank Guillaume Daudin for generously sharing this data with me.

Figures 2 and 3 demonstrated that European trade openness as a whole increased during the 1870-1914 period. Figure 4 demonstrates the second key dimension of deepening trade openness during this period: the integration of other major economies into the previously UK-dominated international trading system.[7] As can be seen from the chart, the two bulwarks of the 'old' international commercial order, the United Kingdom and France, each experienced real trade growth between 1870 and 1913 of only 222 percent – the joint third-lowest increase in Western Europe.[8] Germany, by contrast, saw its real trade grow by more than double this amount, at 465 percent; substantially higher than both the European and rest-of-world averages (plotted on the chart as dashed lines). Of course, drawing sweeping conclusions from such an observation would leave me at risk of the endogeneity

[7] (Daudin et al., 2010, p. 7)
[8] The Netherlands, another 'old' European commercial centre with a maritime history of global trade, recorded the lowest score, with growth of just 151 percent.

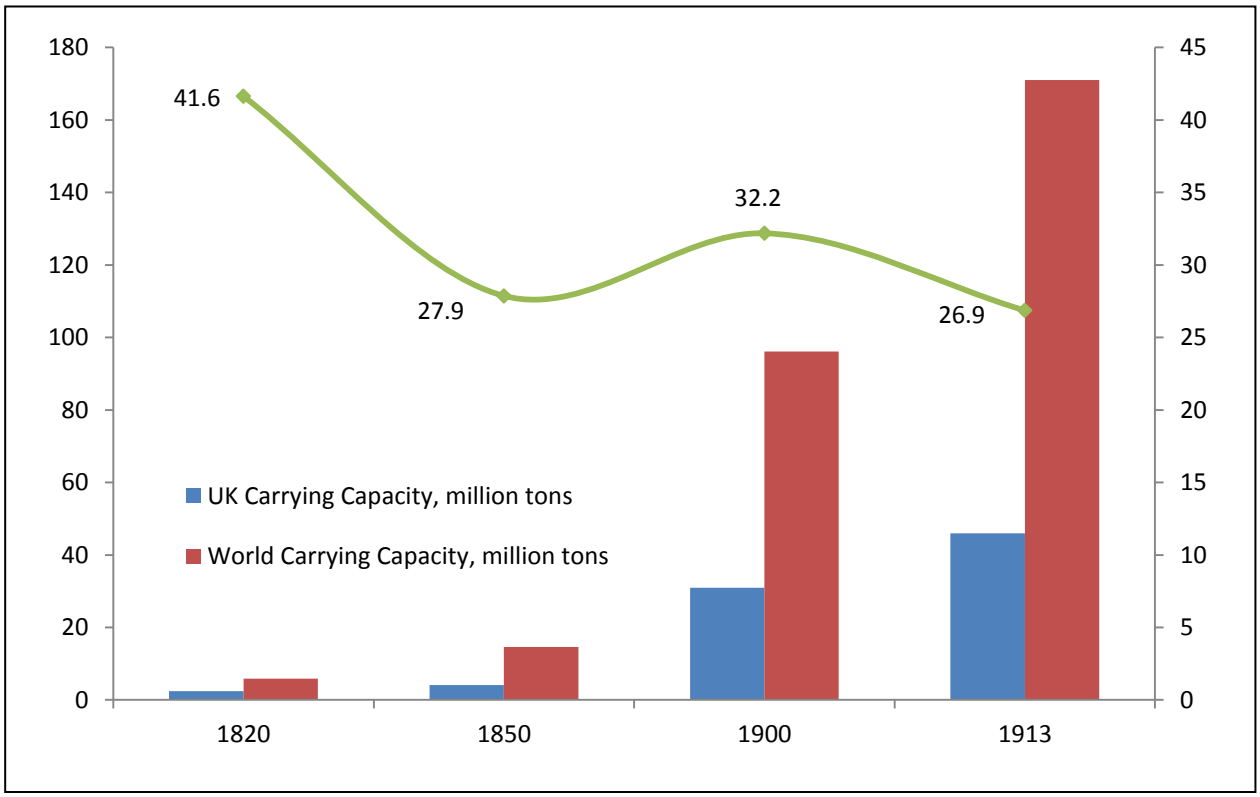
critique: countries export more when they are developing industrially, so attributing economic growth to deepening trade integration without reference to deepening trade integration itself being a product of economic growth is problematic. Moreover, this data is clearly confined to Western Europe only; I turn to broader aggregate shifts in trade patterns that incorporate other major powers, most notably the United States, below. Nonetheless, as one component of a broader narrative, the data in figure 4 is telling.

Corollary data that supports the story told by figure 4 is presented in figure 5. This lists evidence of the total carrying capacity of the world merchant shipping fleet, and calculates the proportion of total world capacity held by the United Kingdom. The UK merchant fleet grew impressively from 1820 to 1913, with its carrying capacity rising from 2.45 million tons to 45.94 million tons over the 93 years. Nonetheless, this was not sufficient to prevent a slide from controlling 42 percent of world capacity in 1820 – a representative year from the United Kingdom's post-Napoleonic Wars 'unipolar moment' – to 27 percent on the eve of World War I.[9] Such a shift supports the hypothesis that other major economies were integrating significantly into the previously UK-dominated international trading order. This was an integrative influence compounded by technological innovations; along with the steam ship itself, the invention of mechanical refrigeration had a profound impact on international trade, with the first shipment of Australian frozen meat arriving in the United Kingdom in 1879 and the first Latin American meat freezing plant opening in 1882.[10] The Suez Canal was also opened in 1869, greatly facilitating maritime trade with the Indian Ocean, Persian Gulf and Far East.[11] The long-term shipping trend masks important micro-level dynamics, of course: the UK merchant fleet's capacity actually grew from 28 percent of the world total in 1850 to 32 percent in 1900. However, such a trajectory is entirely consistent with the idea of the United Kingdom as a leading economy that drove international

[9] (Maddison, 2003b)
[10] (Maddison, 2003a, p. 24)
[11] (Daudin et al., 2010, p. 7)

commerce, only to see its leading status eroded by that very commerce. Figures 20 and 21 are also supportive of this point.

Figure 5. UK and World Total Merchant Shipping Capacity (LHS), and UK Capacity as a Proportion of World Capacity, % (RHS)



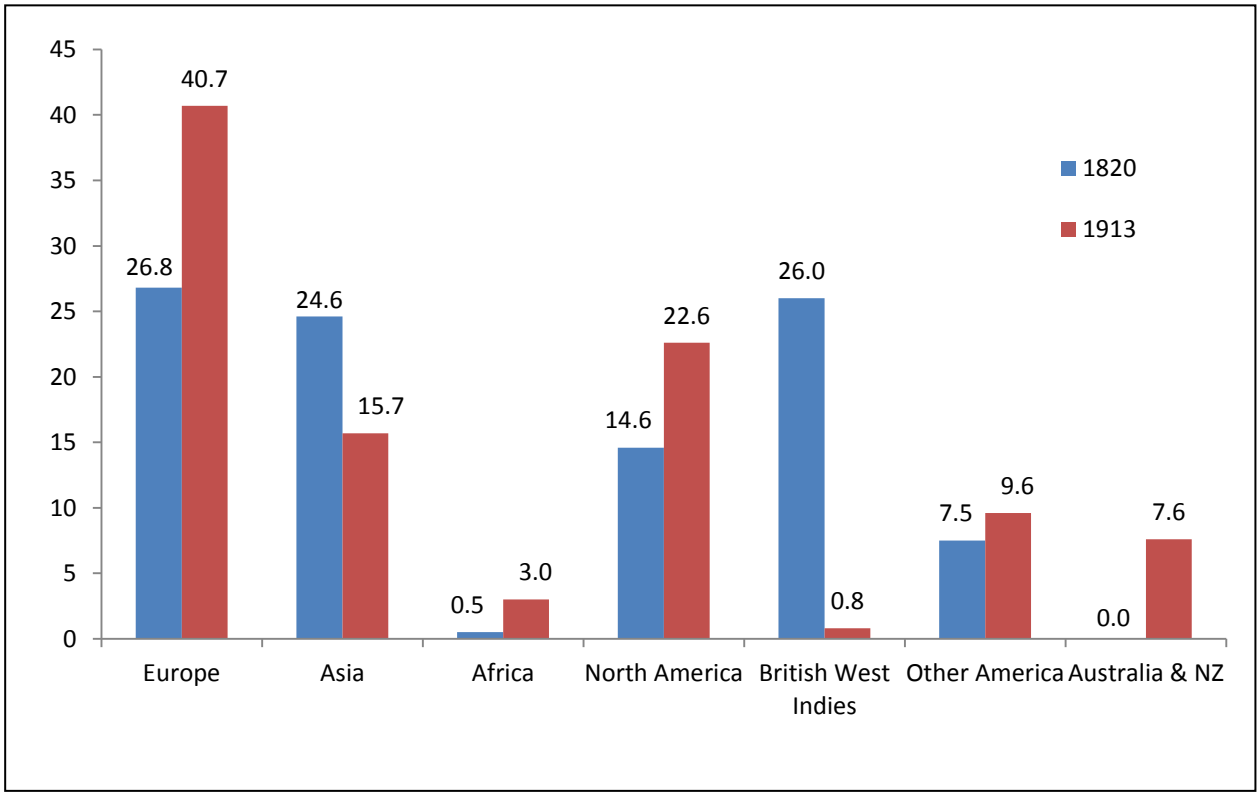
Source: Maddison (2003); UK shares are my calculations.

If the United Kingdom had previously dominated the international trading system but was joined by other major international traders as integration took hold, how did its trading patterns change? Figures 6a and 6b provide some clues. The evidence in these charts suggests that as other European countries and the United States caught-up with – and in the latter case, surpassed – the United Kingdom as trade-integrated industrial powers, UK trade patterns changed markedly.[12] European countries took a significantly smaller share of UK commodity exports by 1913 than they had in 1820, both as they themselves – led by Germany – became

[12] Unfortunately, data is not provided for intermediate years between 1820 and 1913 in the series used here, meaning that intra-period micro dynamics cannot be parsed out.

major commodity exporters, and as non-European regions became of increased economic significance. Notably, Germany became the principal exporter of manufactured goods to such traditional UK markets as the Netherlands, Sweden and Romania.[13] Correspondingly, both Europe and North America increased their share in UK commodity imports, as the United Kingdom went from being undisputed industrial leader in practically every sphere to but one member of a top-tier industrial exporters' club that now included other equal players.[14]

Figure 6a. UK Commodity Imports by Regional Origin, %



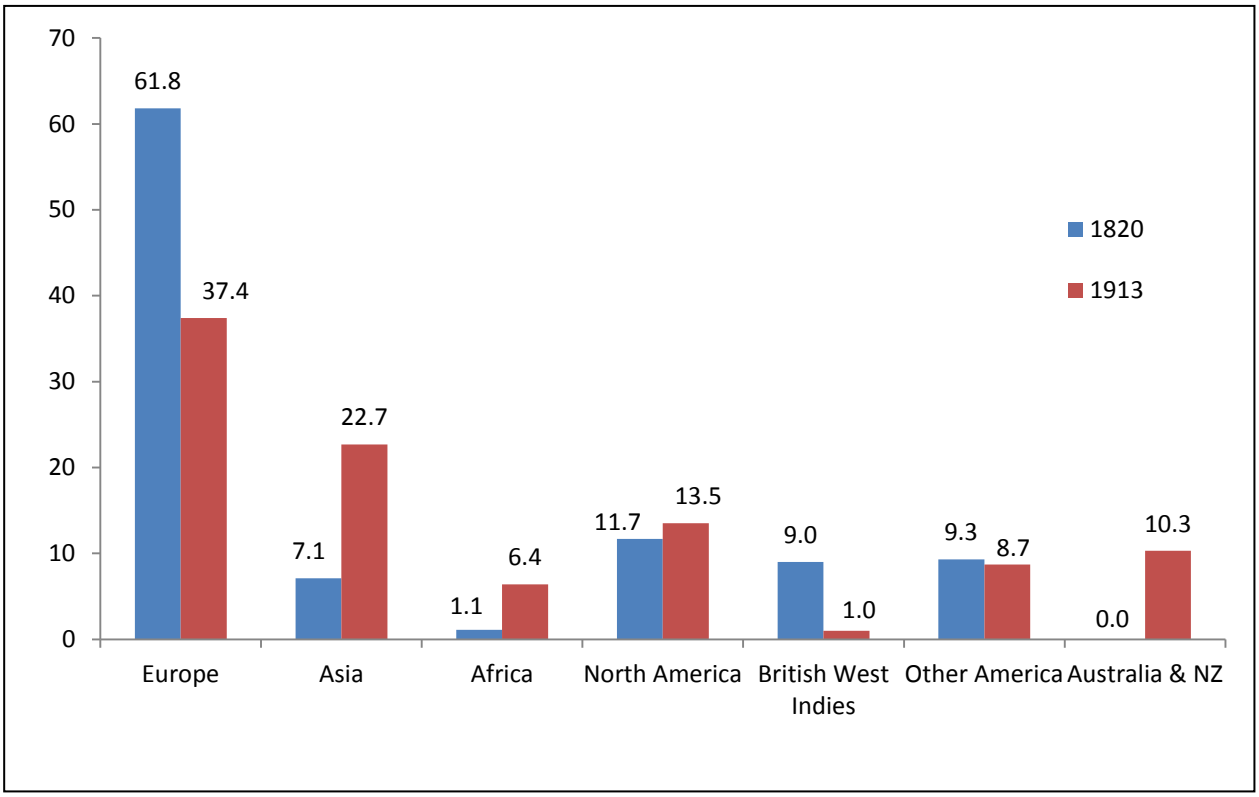
Source: Maddison (2003).

Continuing with the move away from Europe specifically to consider pre-World War I trade integration in its broader transatlantic context, there is also evidence of an intimate trading relationship between the United Kingdom and United States – a country traditionally

[13] (Kennedy, 1980, p. 56)
[14] (Maddison, 2003b)

thought of as less involved with nineteenth-century international commerce – during the 1870-1914 period. Figure 7 presents current account data for the two major English-speaking economies from that time.[15] With the US data inverted, there is a visible correlation between the movement of the two curves – with the implication that exports and imports from each had a non-trivial impact on the balance of payments position of the other. Only after 1910 do the two curves display any notable divergence. Accordingly, while such data does not in itself refute the contention that the United States was less integrated into global commodity markets in general than other major powers, it does at least point towards a significant transatlantic trading relationship.

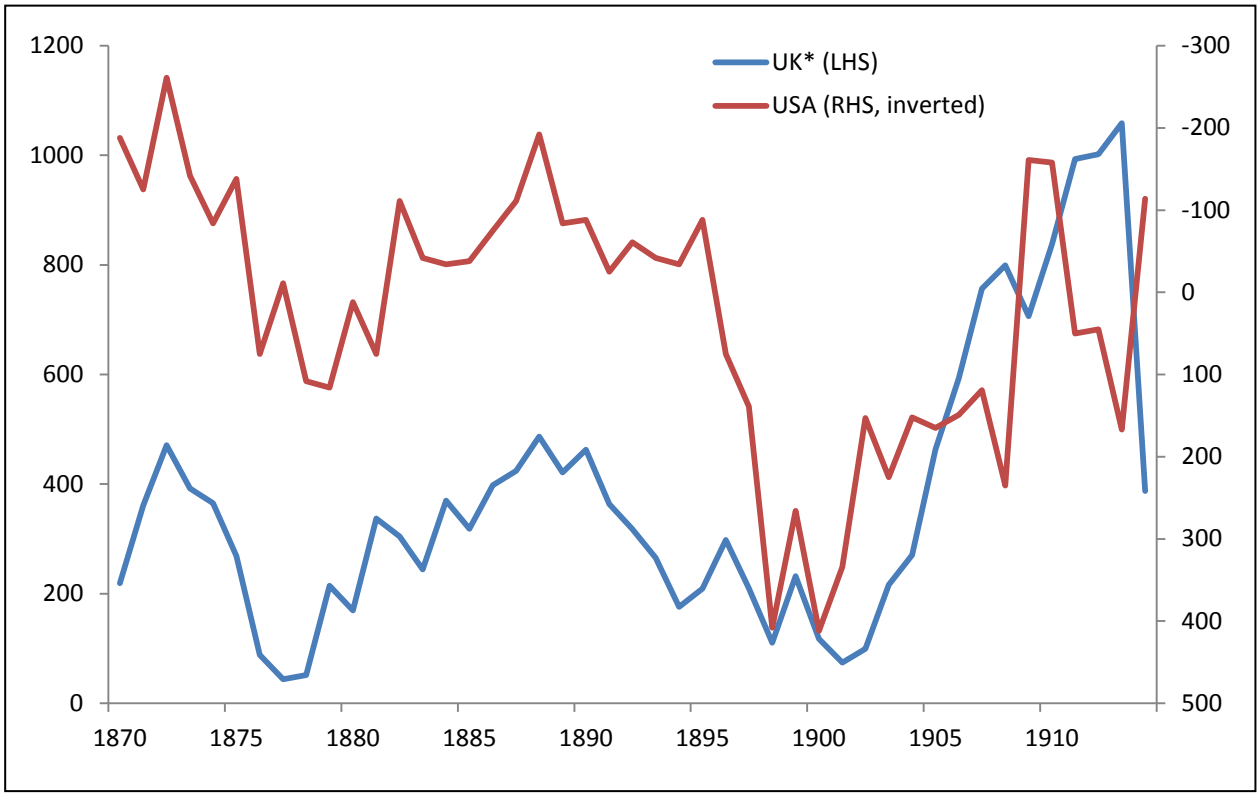
Figure 6b. UK Commodity Exports by Regional Destination, %



Source: Maddison (2003).

[15] (M. T. Jones & Obstfeld, 2001)

Figure 7. UK and US Current Account Balances, then-year US$ million

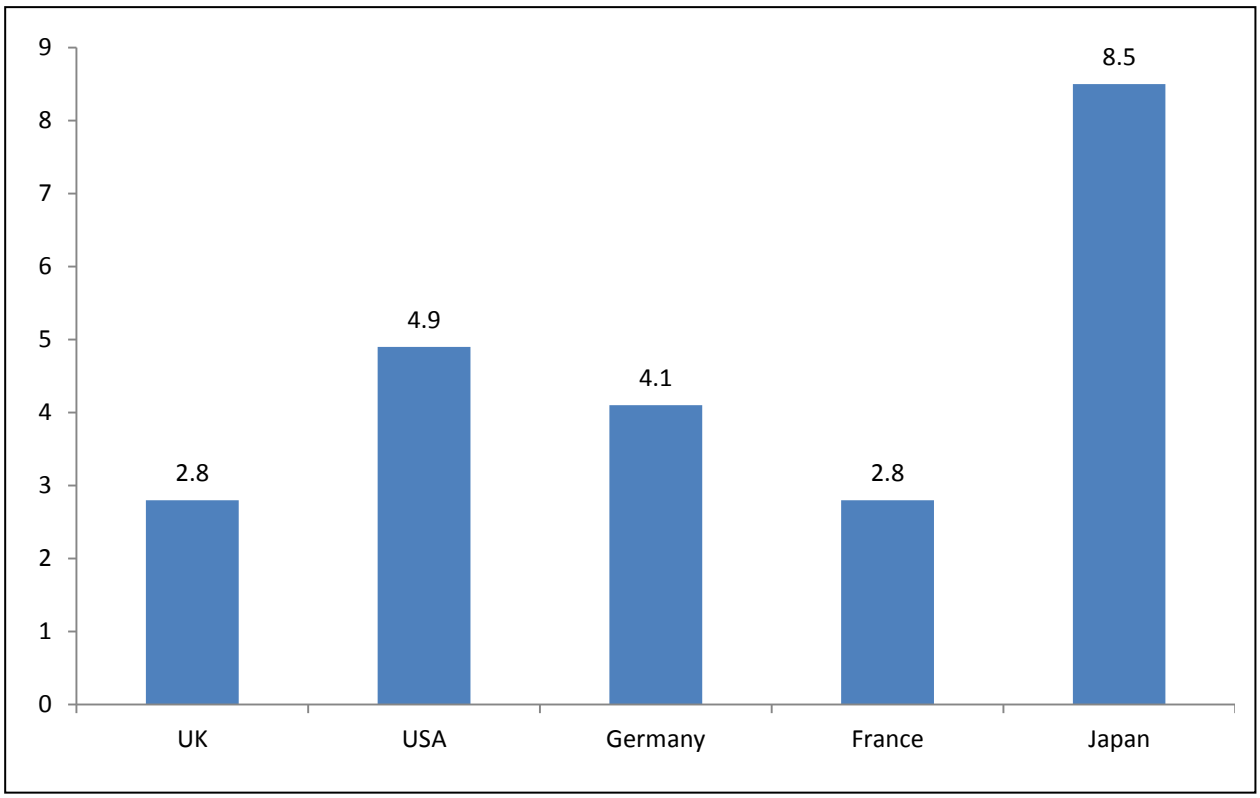


Source: Jones and Obstfeld (2001). Data accessed on 15 February 2011 at http://www.nber.org/databases/jones-obstfeld/. *Approximate US dollar data generated for the United Kingdom by multiplying the pound sterling figure by five, in accordance with the guidance note in Kennedy (1980), p. x.

Figure 8 summarises the trade gains made by five key major powers over the 1870-1914 period, by detailing the average annual export growth (by volume) of the United Kingdom, France, Germany, the United States and Japan. As in the overall growth by value data presented in figure 4, the two principals of the early-to-mid nineteenth century international commercial order – the United Kingdom and France – are tied in joint last place, with average annual export volume growth of 2.8 percent. Germany made impressive gains of 4.1 percent annually, while the United States performed even better, with exports growing by an average of 4.9 percent each year. Most strikingly, Japan posted gains of 8.5 percent annually: this was coming from a very low base, to be sure, but it is nevertheless an important case of a newly-industrialising economy integrating into the Atlantic-dominated international

trading system at a spectacular pace.[16] Given its globally comparative perspective, this chart adds to the picture of international openness not simply increasing over the 1870-1914 period, but also extending away from the Franco-British imperial nexus to incorporate the vast majority of the major sovereign states in the international system at the time.

Figure 8. Selected Major Powers' Export Volume Growth (1990 US$ terms), % year-on-year, 1870-1913 annual average



Source: Maddison (2003).

The combined impact of these shifts on the balance of world trade is laid out in figures 9a and 9b, which summarise the 1870-1913 changes in the export shares of all late nineteenth century major powers, with the exception of Austria-Hungary. In 1870, the United Kingdom and France were the world's two largest exporters by value, with total annual

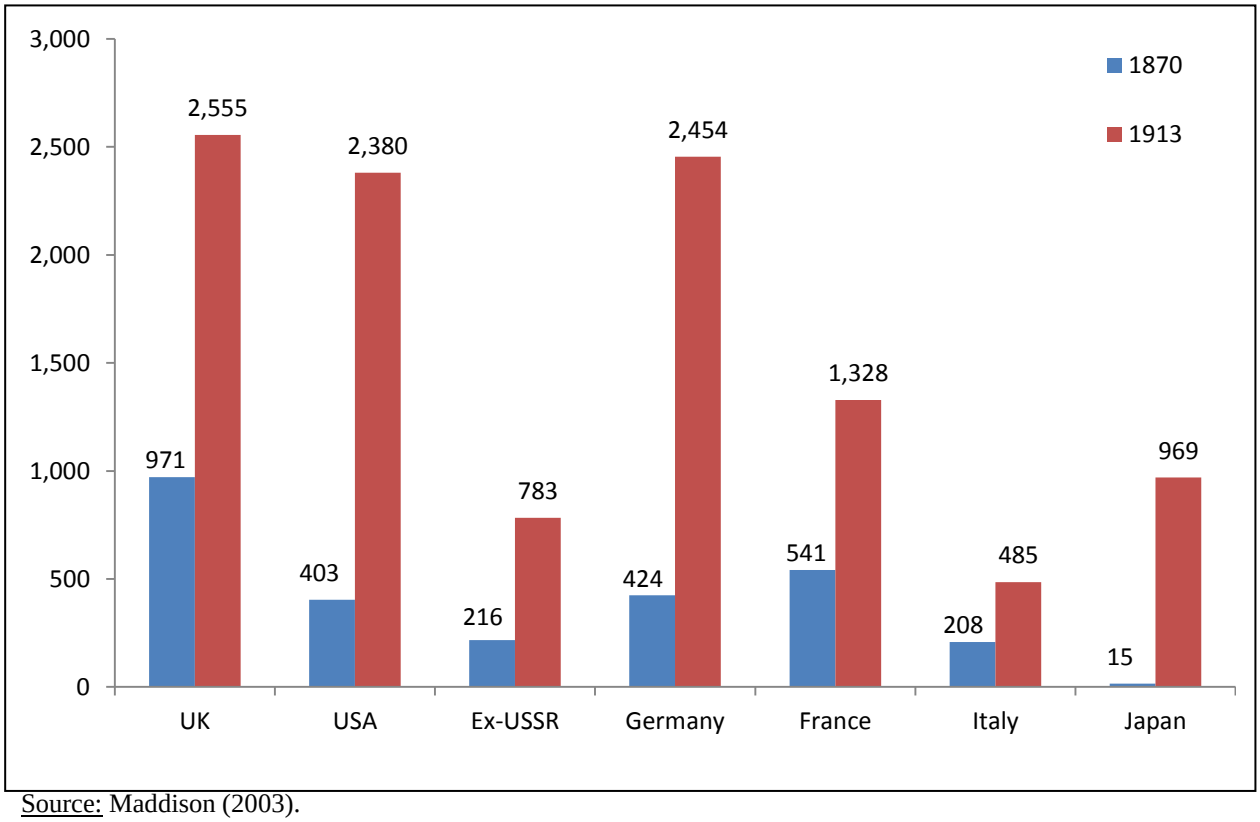
[16] (Maddison, 2003b) Note that a key limitation of using the Maddison data is that – because it treats states by their contemporary borders – it is not of much use in discussing the Austro-Hungarian or Ottoman Empires, since modern-day Austria and Turkey each cover so much smaller a geographical area than their imperial predecessor states did.

exports of $971 million and US$424 million respectively (in 1870 US dollar terms).[17] Only France had exports worth more than half of the UK's total, at 56 percent; both Germany and the United States were just above the 40 percent threshold. Yet by 1913, Germany's exports had increased to $2.5 billion (in 1913 dollars), 96 percent of the value of UK exports (and nearly double the value of France's), while the United States' figure had increased to 93 percent ($2.4 billion). Part of the latter's gains on this by-value metric owe to dollar appreciation, as well as to trade volume growth, but the overall shift in the balance of world exports is undeniable. Meanwhile, Russia's exports (coded approximately as the former USSR in this dataset, for continuity purposes) had increased from 22 percent to more than 30 percent of the value of the United Kingdom's. And perhaps most strikingly of all, Japan's increased from a paltry 2 percent in 1870 to an impressive 38 percent in 1913. Only France and Italy saw their exports as a proportion of UK exports decline between 1870 and 1913, to 52 percent and 19 percent respectively.

In short, the hypothesis that there was serious integration of the international commodity market that widened from mid-nineteenth century UK domination to include a number of top-tier industrial exporters between 1870 and 1913 is comprehensively borne-out by the data. And insofar as this supports the contention that there was a significant expansion of international trade, at least in goods, this shows the first of the core causal mechanisms identified by my theoretical model to have been fully operational during this time. Services data is harder to come by in time-series form, but again, the available evidence – the UK surplus in business services trade averaged $800 million over 1911-13 – is consistent with the overall picture.[18] The most salient dynamic during this time was of course the deepening

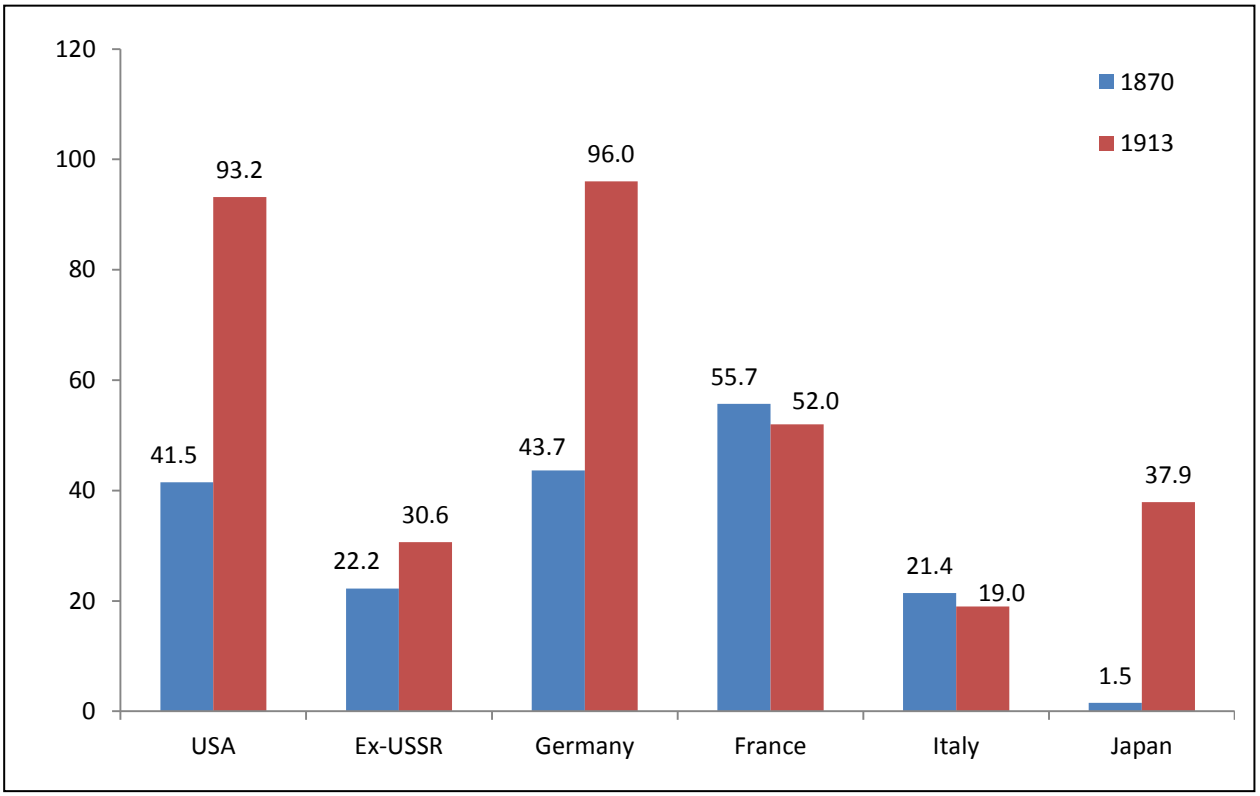
[17] (Maddison, 2003b)
[18] (Daudin et al., 2010, p. 9)

Figure 9a. Value of Major Powers' Exports, then-year US$ million*



Source: Maddison (2003).

Figure 9b. Follower Economies' Exports, % of UK exports (then-year US$ terms)



Source: My calculations, based on data in Maddison (2003).

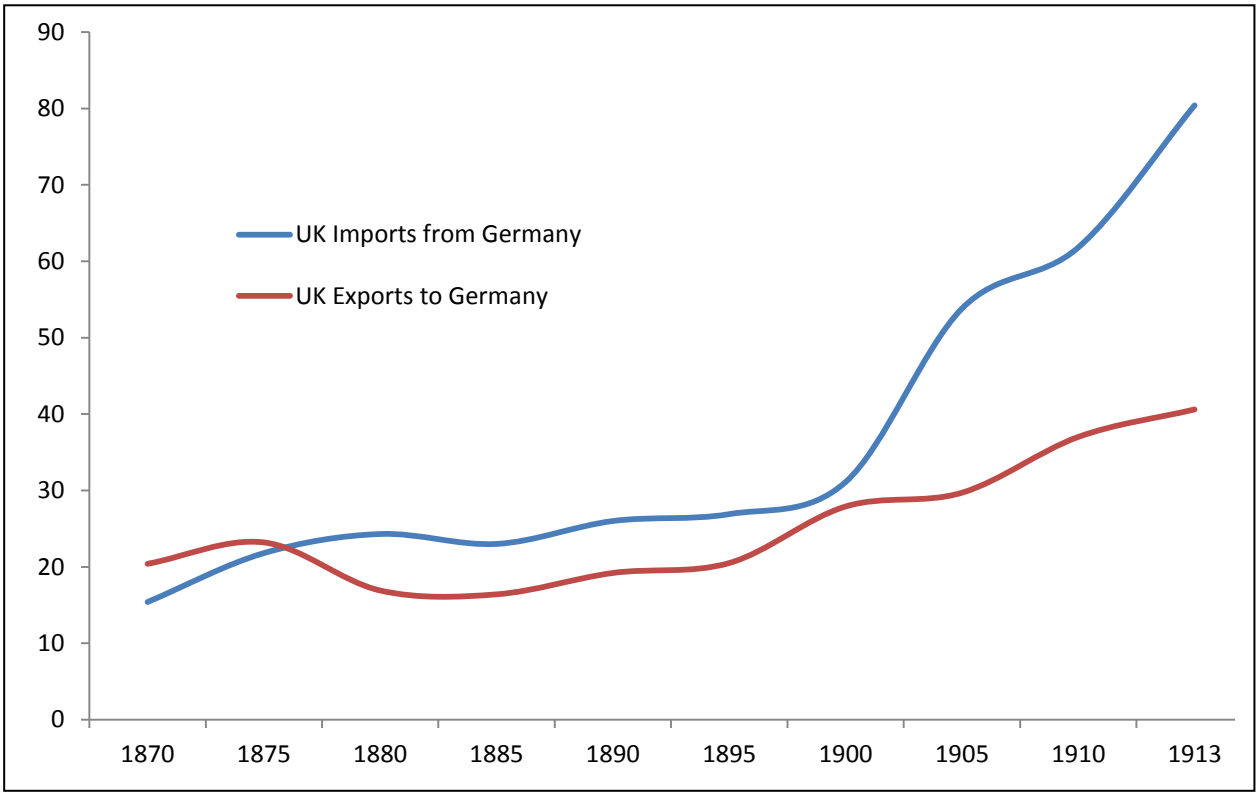
integration of Germany into international trade, with the result that it came to be an equal commercial rival to the United Kingdom and a far superior economic force to France by 1913. The UK-German bilateral trading relationship is particularly noteworthy, with the United Kingdom going from holding a slim lead in exports to the other in 1870 to Germany having almost double the exports of the other by 1913, as figure 10 shows – a telling sign of the latter's catch-up in key export sectors.[19] Even at the height of the naval arms race in 1907, Britain imported iron and steel worth £5 million from Germany while Germany imported iron and steel worth more than £3 million from Britain, a remarkable indicator of the depth of their trading relationship.[20] But other dynamics – the ongoing ascendance of the United States, the spectacular rise (albeit from a very low base) of Japan, and the qualified economic modernisation of Russia – all point towards a general pattern of international goods market integration and 'trade multipolarity.'

Moreover, there are compelling reasons to believe that this trade integration contributed to catch-up growth via the mechanisms described in this dissertation's earlier theoretical section. As Kennedy notes, as Germany began to industrialise, it relied heavily on imports of steam engines, textile machines, locomotives, rails, and other advanced manufactures – the bulk of which came from the United Kingdom.[21] This process began before 1870, to be sure, but as it continued apace – and was joined by large flows of industrial inputs, such as coal – it was instrumental in driving Germany's economic rise, with its rising share of world exports serving as both an indicator of its economic integration and a symptom of its development.[22] Similar conclusions – albeit with markedly differing starting points – can also be drawn about the development of the United States, Japan, and Russia.

[19] (Kennedy, 1980, pp. 45, 293)
[20] (Joll, 1992, p. 148) Indeed, the fact that each was one of the other's two principal export markets between 1904 and 1914 was arguably one of the most crucial overall dynamics of the period: (Steiner & Neilson, 2003)
[21] (Kennedy, 1980, p. 41)
[22] (Kennedy, 1980, p. 47) Data on capital goods imports and exports by value and destination for the 1870-1914 period is being assembled by Professor Jeffrey G. Williamson, of Harvard University and the University of Wisconsin, but it is not yet ready for use. I thank him for his guidance on this matter.

Given this dissertation's theoretical argument, therefore, the trade integration dimension during 1870-1914 appears crucial.

Figure 10. UK Trade with Germany, then-year GB£ million



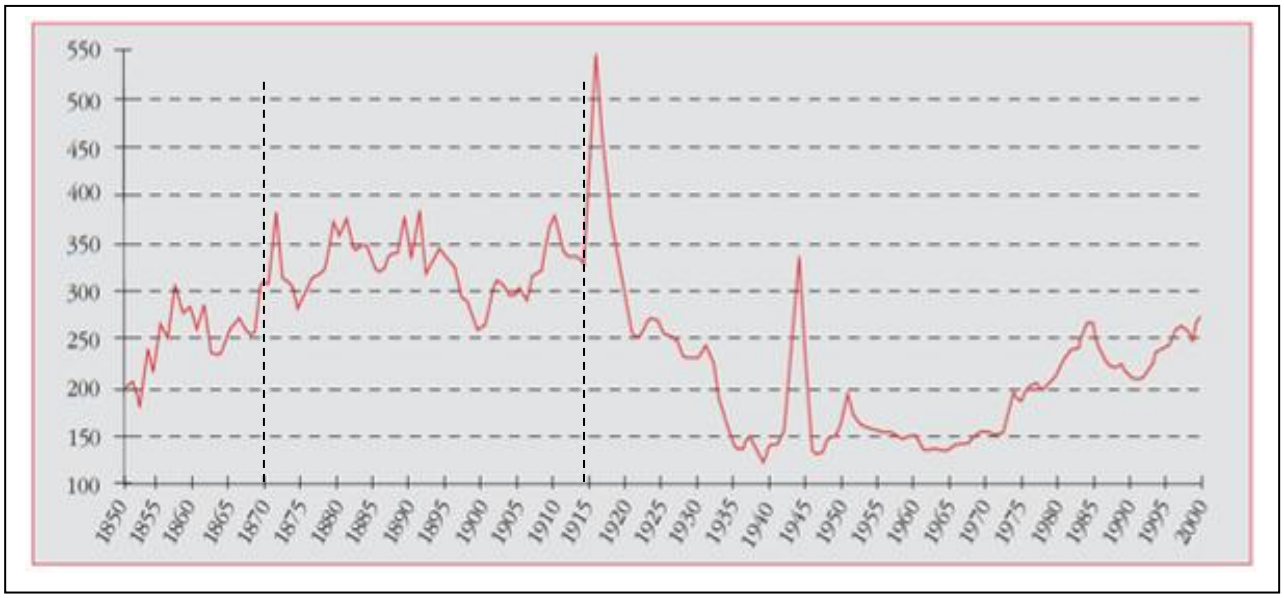
Source: Kennedy (1980), Tables 3.3 and 15.4 (p. 45, p. 293).

Below, I turn to the next important aspect of 1870-1914 economic integration: financial capital flows. However, as a final note on the trade section, figure 11 presents long-term data on the relationship between trade and gross fixed capital formation (GFCF).[23] Given that it shows trade levels relative to total GFCF to be comparatively high during the 1870-1913 period, this provides at least a partial rebuttal to one possible critique of the integration-convergence hypothesis: namely, that catch-up growth by other major powers during this period owed to a domestic development push alone. As stressed throughout, economic integration cannot drive catch-up growth in states that do not have a sound domestic development strategy in place. Nonetheless, the fact that total GFCF was

[23] (Carreras & Tafunell, June 2008, pp. 38-42)

comparatively low relative to trade throughout 1870-1913 points in the direction of international commerce playing a non-trivial role in such catch-up growth as there was during this period.

Figure 11. Foreign Trade/GFCF in Western Europe, 1850-2000

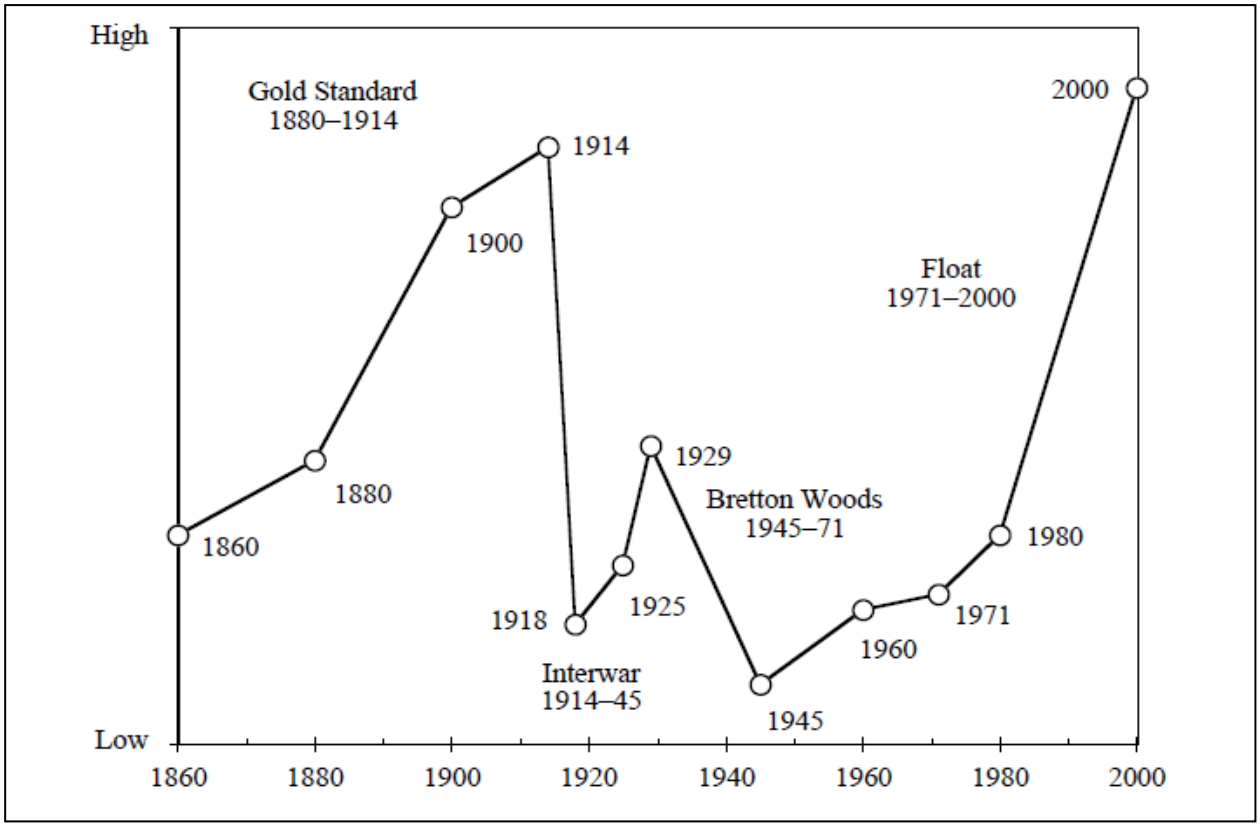


Source: Carreras and Tafunell (2008), Chart 17 (p. 42). 'GFCF' is an abbreviation of gross fixed capital formation. Data is for sixteen Western European economies. Note that this chart is extracted directly from the original publication, rather than being self-plotted, as I was unable to access the underlying data; Carreras and Tafunell (2008) therefore retain image copyright.

International Financial Flows, 1870-1914

The second key element of international economic integration that generates the potential for catch-up growth is cross-border financial flows. International capital markets also achieved unprecedented integration during the 1870-1914 period, and sustained this integration over most of the 44 years – the one principal caveat to that being the Panic of 1890 and its immediate aftermath, when financial markets came close to a 'sudden stop' in

Figure 12. A Stylised View of International Capital Mobility, 1860-2000



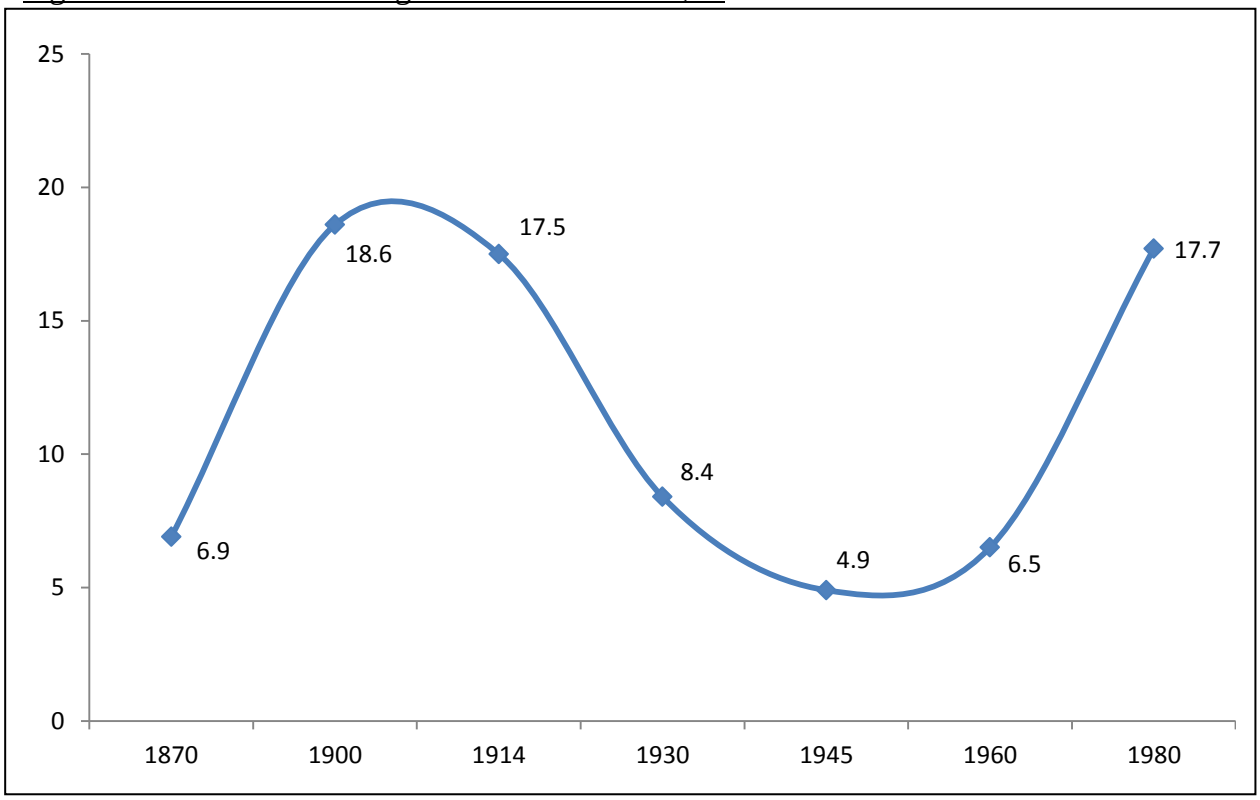
Source: Obstfeld and Taylor (2002), p. 6; note that they retain copyright on this image. For a technical presentation of the same essential overview, see also O'Rourke and Williamson (1999), Figure 11.2 (p. 213).

the wake of Barings bank's insolvency and near-collapse.[24] Referring back to figure 1 and the data of Marc Flandreau et al., at least on Feldstein-Horioka estimators of current account disconnectedness, the financial integration achieved during the highs of 1888-90 and 1908-11 had not been matched as of 1996.[25] Likewise, Maurice Obstfeld and Alan Taylor's study of international capital mobility – summarised via a stylized diagram that smoothes-out the intra-period fluctuations in figure 12 – concludes that capital was more mobile in 1914 than it ever had been, or would be again until the late 1990s.[26] Figure 13 puts values on this intuition over the long cycle, by presenting data on the total world foreign assets as a percentage of global GDP from 1870 to 1980.[27] Accordingly, the purpose of this section is to contribute to

[24] (Flandreau et al., 2010, p. 105) The temporary retardation of financial integration induced by the Barings Crisis is plain to see in many of the charts presented here.
[25] (Flandreau et al., 2010, p. 100)
[26] (Obstfeld & Taylor, March 2002, p. 6)
[27] (Crafts, March 2000, p. 27)

testing the dissertation's overall theoretical argument, by both providing further evidence of the depth and form of this integration, and exploring mechanisms by which this integration could have contributed to catch-up growth in follower economies.

Figure 13. Total World Foreign Assets/World GDP, %

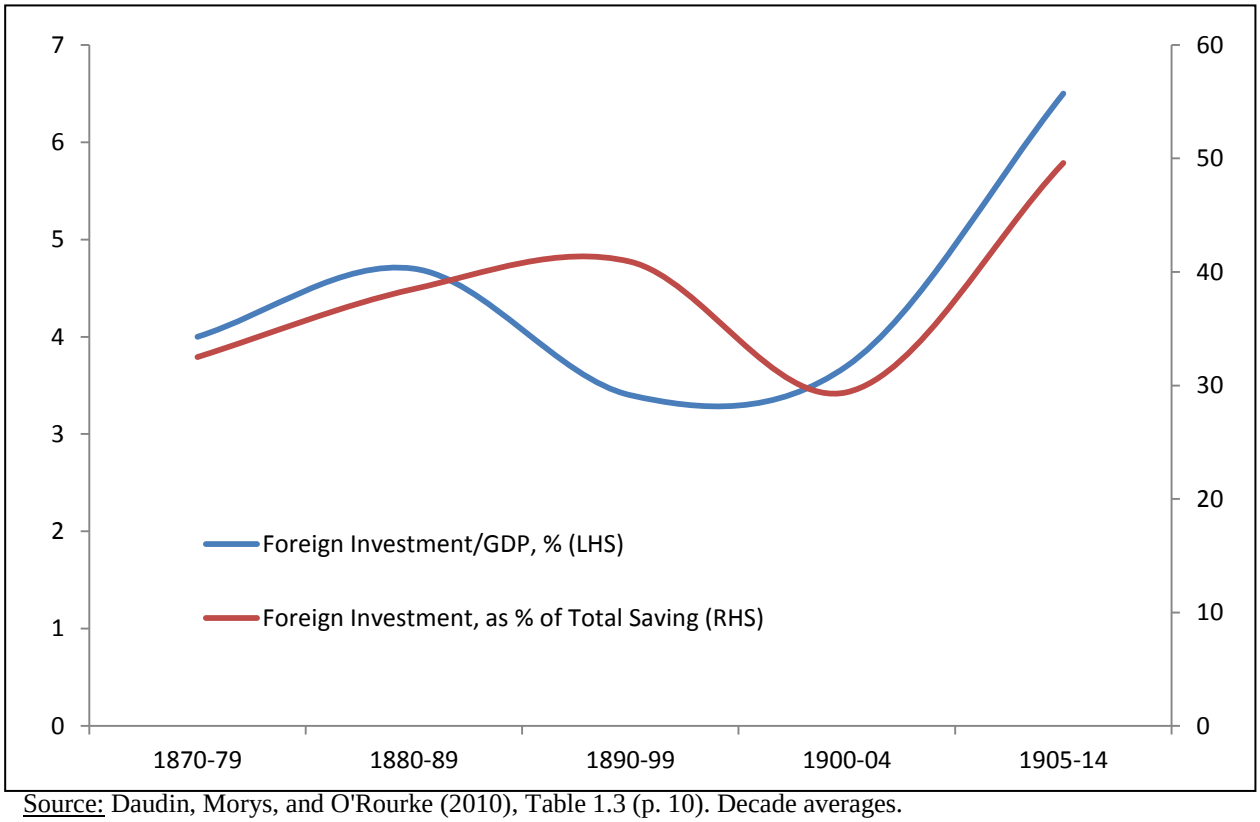


Source: Crafts (2000), Table 2.3A (p. 27). Note the lack of linear time progression here; data is presented irregularly for particular milestone years, with smoothing in between.

Figures 14a and 14b present aggregate data on the three leading European economic powers' foreign investment activities. The United Kingdom, France and Germany all saw their foreign investment as a proportion of total savings reach levels in 1870-1914 that surpassed those of the previous period. That said, there were marked differences in both when they achieved that peak – 1870-74 for France, 1885-89 for Germany, and 1910-14 for the United Kingdom – and in the overall peak that they achieved – 19.3 percent for Germany, 25.9 percent for France, and 53.3 percent for the United Kingdom.[28]

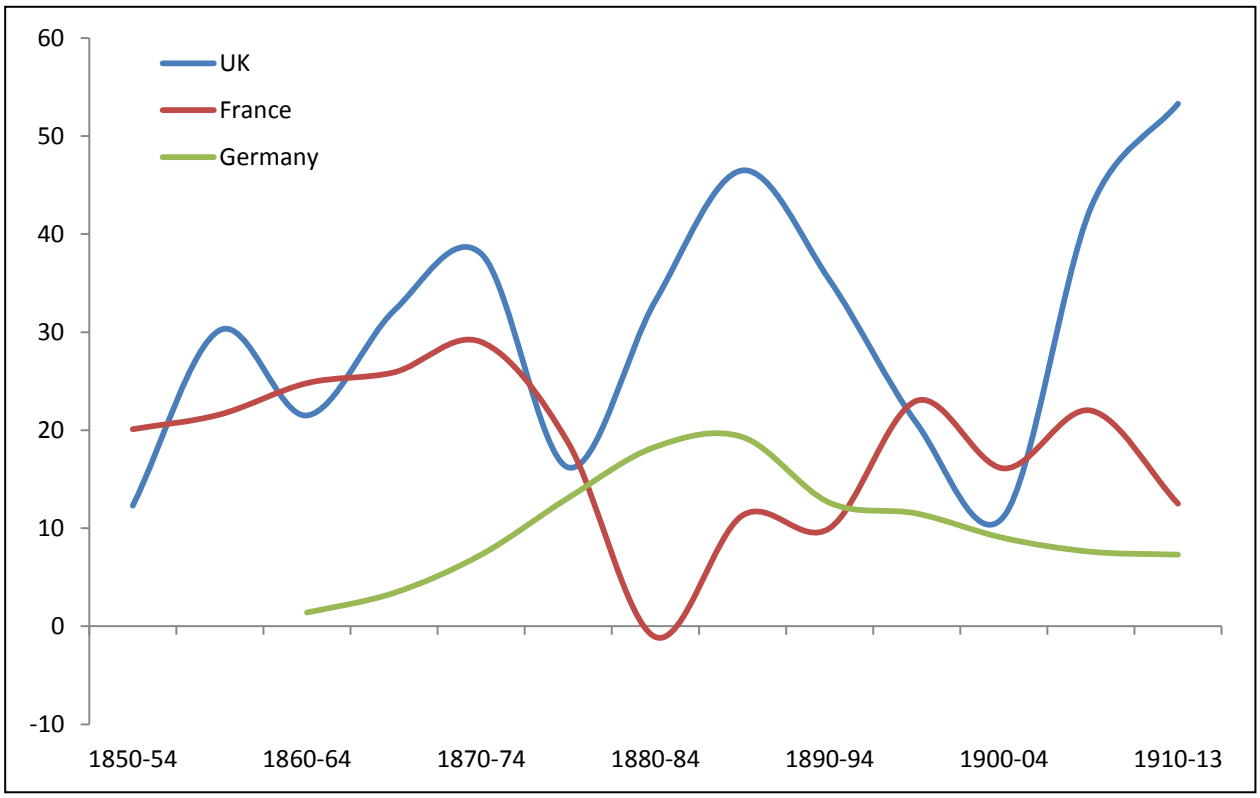
[28] (O'Rourke & Williamson, 1999, p. 209)

Figure 14a. UK Foreign Investment, 1870-1914



Source: Daudin, Morys, and O'Rourke (2010), Table 1.3 (p. 10). Decade averages.

Figure 14b. Foreign Investment as a Proportion of Saving in the West European Powers, %



Source: O'Rourke and Williamson (1999), Table 11.1 (p. 209). Five-year averages.

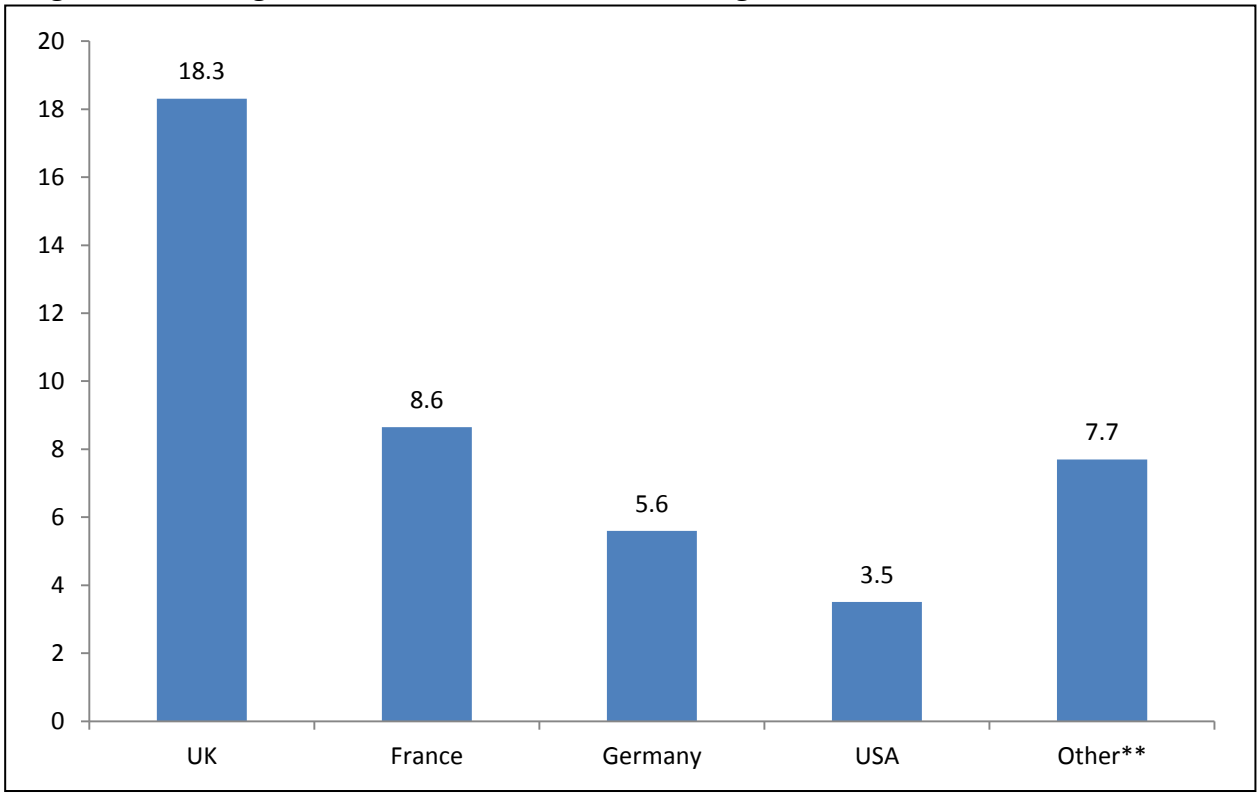
Unsurprisingly, as figure 14a shows, the United Kingdom – the international system's technologically leading economy at the start of the 1870-1914 period, a maritime-imperial power, and the state that had led the international commercial order for most of the preceding century – displayed a particularly marked enthusiasm for overseas investment. UK annual foreign investment as a proportion of GDP culminated at an average of 6.5 percent in the decade prior to World War I; by 1913, UK foreign assets were equivalent to one-and-a-half times British GDP, and income from them meant that national income was more than 9 percent greater than UK domestic product.[29] Again, as in the goods trade sector, this was a trend compounded by UK technological innovations that were then diffused: by 1870, UK financial firms had instantaneous connections with North America and India, via telegraph, paving the way for the expansion of international capital flows that followed.[30] The data presented in figures 14a and 14b is entirely consistent with the idea that periods of international economic integration – including 1870-1913 – not only entail increasing cross-border financial flows in general, but more importantly, that financial flows from the leading economy(s) can be a key driver of catch-up growth in follower economies.

Figure 15 presents US dollar data on the gross nominal investment activities of the four leading industrial economies on the eve of World War I.[31] This chart further supports the notion that the 1870-1914 period witnessed large-scale cross-border financial flows, given the sheer scale of the figures involved. Moreover, it further supports the contention that 'old' lead economies – which at the start of the 1870-1914 period, meant the United Kingdom and France – tend to be a source of capital flows for follower economies. Explaining the rationale behind this pattern, Angus Maddison observes of the United Kingdom from the 1870s onwards that it 'was a wealthy country operating close to the frontiers of technology, so its

[29] (Daudin et al., 2010, p. 10; Maddison, 2003a, p. 24)
[30] (Maddison, 2003a, p. 24) The wider impact of international telegraphy is discussed in more detail later in this chapter, in the section on technological diffusion and information-sharing.
[31] (Maddison, 2003b)

rentiers were attracted to foreign investment even when the extra margin of profit was small.'[32] To be sure, Germany and the United States – the two principal follower economies empowered between 1870 and 1914 – were both involved in non-trivial levels of foreign investment activity themselves during this period, meaning that the relationship must not be caricatured as simplistically linear. Nonetheless, the overall direction of travel is clear from the data: the United Kingdom, followed by France, was the single greatest supplier of financial flows to the rest of the world, and – given this dissertation's theory – this points in the direction of financial integration as a source of catch-up growth-driving capital accumulation in follower economies, Germany and the United States included.

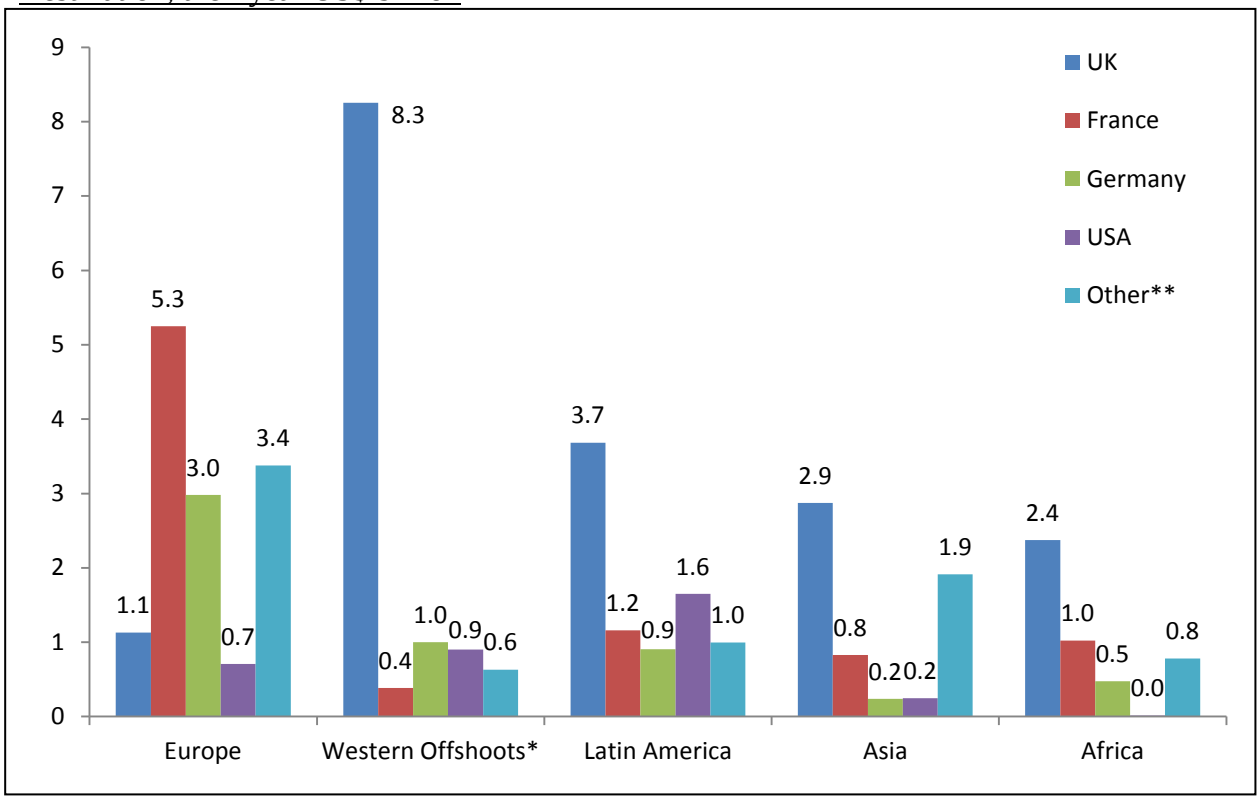
Figure 15. Leading Powers' Total Gross Nominal Foreign Investment in 1914, US$ billion*



Source: Maddison (2003). *At 1914 values. **'Other' here means Belgium, the Netherlands, Portugal, Russia, Sweden, Switzerland, and Japan.

[32] (Maddison, 2003a, p. 24)

Figure 16a. Leading Powers' Gross Nominal Foreign Investment in 1914 by Value and Destination, then-year US$ billion



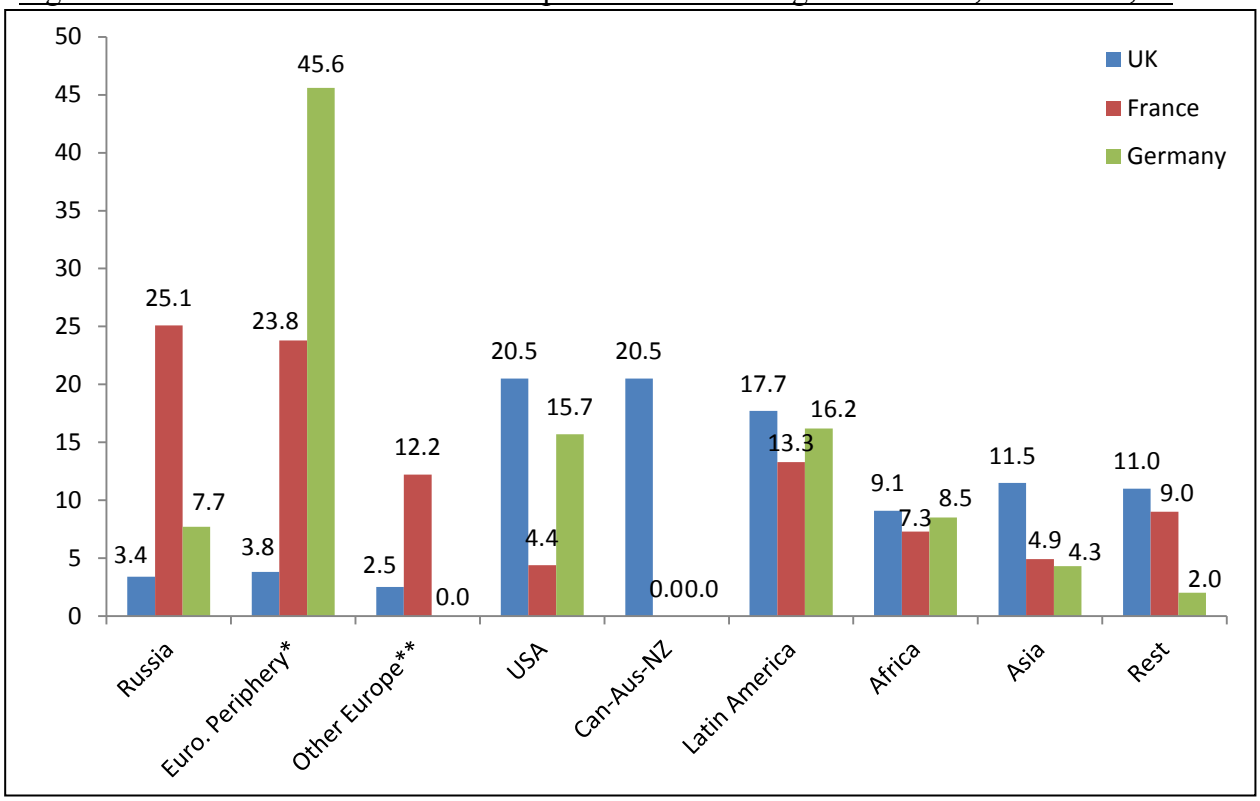
Source: Maddison (2003). *'Western Offshoots' here means the United States, Canada, Australia and New Zealand. **'Other' means the same as in figure 14.

Figures 16a and 16b add fine-grained detail to the broader point made above, by drawing on two different data sources that break the major powers' foreign investment down by destination.[33] This allows us to see the scale of the overall phenomenon, as well as highlighting some important intra-case differences. Figure 16b shows the proportions of each major economy's foreign investment received by each world region over the 1870-1913 period, while figure 16a gives those proportions context by laying out what they amounted to in actual then-year US dollar terms in 1914 (although less sub-regionally specific detail is included in the 16a data). Figure 16a shows that the largest single recipient of any one foreign power's investment was the 'Anglophone New World' – the United States, Canada, Australia and New Zealand – which between them played host to $8.3 billion of UK foreign investment as of 1914 (divided equally between the former country and the latter three, according to

[33] Respectively: (Daudin et al., 2010, p. 12; Maddison, 2003b)

figure 16b). France, for its part, had sent $5.3 billion in foreign investment to the rest of Europe as of 1914, of which the largest single recipient was Russia, followed by the European 'periphery' (Southern and non-Russian Eastern Europe), followed by 'other Europe' (that is, the rest of Western Europe, most notably including Germany).

Figure 16b. Destination of Selected European Powers' Foreign Investment, 1870-1913, %



Source: Daudin, Morys, and O'Rourke (2010), Table 1.4 (p. 12). I thank Kevin O'Rourke for generously sharing this data with me. *'European Periphery' here means the Ottoman Empire, Austria-Hungary, Spain, Portugal and Italy. **'Other Europe' here includes Germany itself.

It is thus here that we see noteworthy divergence between UK and French foreign investment behaviour. UK investment was predominantly concentrated beyond the bounds of Europe, which received only around 6 percent of the UK total – with the largest single recipient of UK European investment being Russia.[34] Indeed, figure 16a shows that Latin America alone played host to more than three times as much UK foreign investment as the whole of Europe by 1914, while Asia had received nearly three times as much. Even Africa

[34] (Joll, 1992, pp. 152-155)

received more than double the United Kingdom's European figure. By contrast, while a smaller foreign investor in overall global terms, France was the principal source of foreign capital in Europe, where more than 60 percent of its foreign investment was directed over the 1870-1914 period as a whole.[35] German investment abroad was also directed mainly within Europe, overwhelmingly in the direction of Southern and Eastern peripheral countries – a dynamic explained largely by close political, cultural, strategic and business ties with Austria-Hungary, which received around 25 percent of German foreign investment.[36] Accordingly, we can see that while there is considerable evidence of financial integration in general terms, including evidence of capital flows from 'old' lead economies to follower economies, these flows were not of a universal character across foreign investors. Rather, the United Kingdom was engaged in true *global*ization of investment, while France and Germany were more focused within the European continent (with the latter country itself being a recipient of non-trivial foreign capital inflows).[37] That said, in both cases, it can be seen that leading economy capital chased profit in follower economies with the resource potential to grow rapidly.[38]

Did these financial flows contribute to growth of the capital stock in follower economies, thereby adding to prospects for catch-up growth? Figures 17a and 17b suggest that they did.[39] Figure 17a shows a visible correlation between French net foreign income, German gross fixed capital formation, and Russian net investment. While this data series unfortunately does not include like-for-like variables in a standardised currency unit, making direct comparison hard, the idea that France – the largest foreign investor in continental Europe – should see its net foreign income rise as capital stocks rose in two major European

[35] (Joll, 1992, p. 152)
[36] (Joll, 1992, p. 158)
[37] On the importance of French loans for the financing of German industrialisation, see (Joll, 1992, p. 151; Strachan, 2001, p. 14)
[38] (Taylor & Williamson, April 1994)
[39] (M. T. Jones & Obstfeld, 2001)

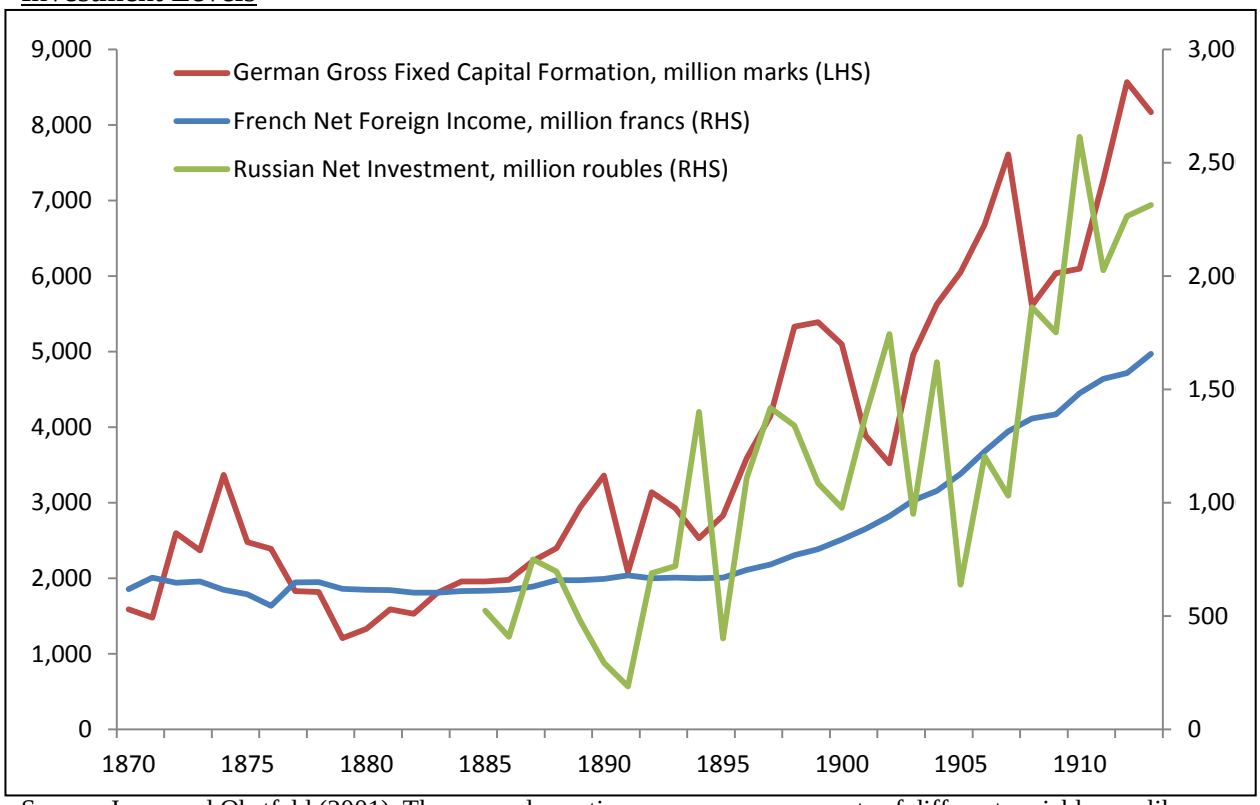
follower economies makes sense. Pivotal milestones in Russian development owed particularly to French finance, such as the development of mines, railways, and industrial enterprises.[40] Moreover, two French loans were important for Russia's very survival: the 1906 loan that 'saved' Moscow in the wake of the Russo-Japanese debacle – from which a German contribution was explicitly excluded, due to French fears of Germany's increasing economic influence – and the 1913 loan that allowed an expansion of the railway network that facilitated military mobilisation and troop movements between 1914 and 1917.[41] Likewise, figure 17b shows that UK net foreign investment – while retarded between 1890 and 1900 in the wake of the Barings crisis – correlated with US gross fixed capital formation. Again, that the net foreign investment of the largest single foreign investor in the Anglophone New World should correlate with capital formation in the largest single foreign investment destination within the Anglophone New World makes sense in light of the story being told here.[42]

Moving away from such aggregate data, there are other reasons to suppose that financial integration played a non-trivial role in driving follower economies' rise during the 1870-1914 period – reasons that might also suggest that UK capital was more involved in Europe than simple balance of payments data appears to suggest. In the late nineteenth century, as in the late twentieth and early twenty-first, the international activities of merchant banks located in the City of London – many of which actually had German-Jewish origins, such as the London operations of the Rothschild family – were frequently less-than-transparent. Accordingly, generalising about the international activities of banks beyond what

[40] (Joll, 1992, p. 153) Joll estimates that by 1914, around 25 percent of all French foreign investment was in Russia.
[41] (Joll, 1992, pp. 153-155)
[42] This all said, however, there is clearly a considerable size gap between UK net foreign investment and US gross fixed capital formation, suggesting that only a portion of the latter can be attributed to the former; this is discussed at greater length in the section on caveats later in the chapter.

is present in aggregate balance of payments data is problematic, and simple overview charts cannot be constructed.[43]

Figure 17a. French Foreign Investment Earnings versus German and Russian Domestic Investment Levels



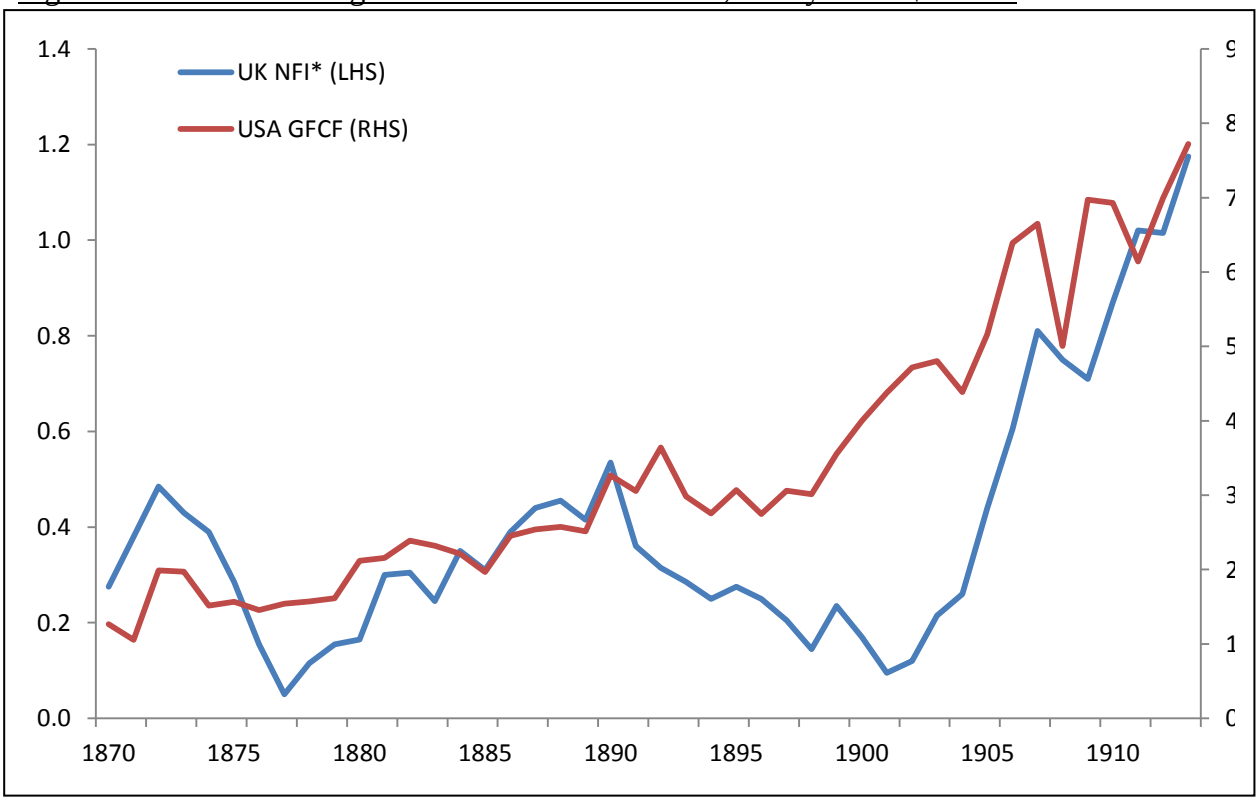
Source: Jones and Obstfeld (2001). Then-year domestic currency measurements of different variables, as like-for-like data not available.

Nonetheless, there seems a compelling case to suggest that when it came to merchant banking, UK finance – within the context of wider international capital market integration – played a non-trivial role in facilitating the development of follower economies, even where the relationship was 'invisible.' Kennedy writes that, 'When German industrialisation stimulated a vast increase in imports of raw materials from overseas, for example, this trade was primarily financed via *London* banks, who would pay in *sterling* for the requisite *Australian* wool or Peruvian silver on behalf of their German clients, arrange for the shipping, usually via a *British* line, of such commodities (either via *London*, or direct to

[43] (Kennedy, 1980, p. 48)

Hamburg), order the necessary insurance at *Lloyd's*, and at the end of the six month period, request the payment, plus charges, from their client.'[44] Such behaviour did not involve any UK investment in Germany, hence not showing up in the data, but it still contributed to German growth. Of course, the United Kingdom was not the only significant centre of finance at the time, with German banks themselves doing plenty of international dealing – much of it in Russia, which is itself significant for understanding catch-up growth elsewhere in Europe.[45] Still, London was unquestionably the world's leading global financial centre at the time. This being the case, it seems that while drawing firm conclusions about the total net impact of cross-border bank transactions on follower economies' catch-up growth is impossible, the overall contribution was significant.

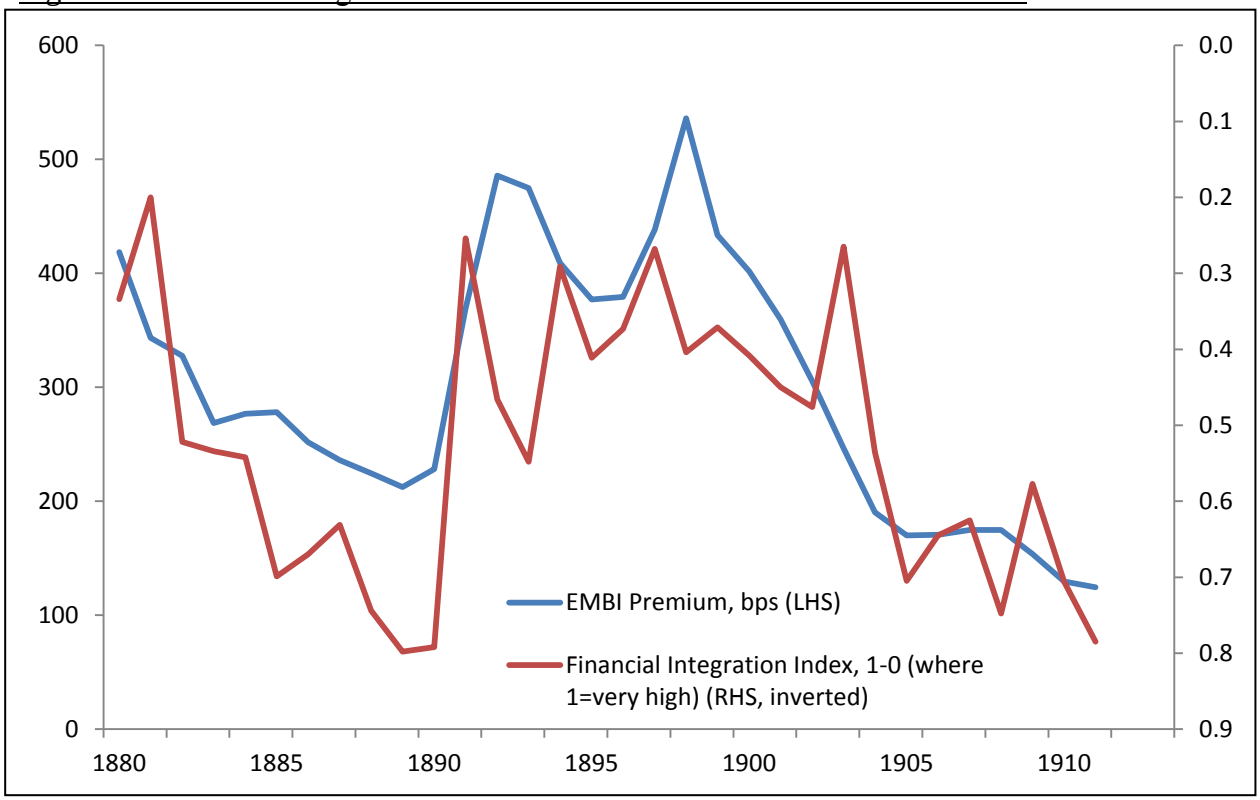
Figure 17b. UK Net Foreign Investment and US GFCF, then-year US$ billion



Source: Jones and Obstfeld (2001). *Approximate US dollar data generated for the United Kingdom by multiplying the pound sterling figure by five, in accordance with the guidance note in Kennedy (1980), p. x.

[44] (Kennedy, 1980, p. 48) Italics added at all points in the chain where UK-led financial integration facilitated German commerce; to clarify selection, Lloyd's of London was (and remains) the leading global insurance market, while Australia was a UK colony at the time.
[45] (Kennedy, 1980, pp. 47-48)

Figure 18. Financial Integration and Governments' Investment Risk Premiums



Source: Flandreau, Flores, Jobst, and Khoudour-Casteras (2010), Figure 4.5 (p. 105). I thank Marc Flandreau and Clemens Jobst for generously sharing this data with me. 'EMBI' stands for Emerging Markets Bond Index – an indicator of default risk on EM sovereign debt. Basis points (bps) are hundredths of a percentage point.

As a final complementary note to wrap-up the section on cross-border financial flows during 1870-1914, it is worth noting that for most of this period, foreign investment was considered relatively safe. Figure 18 plots a measurement of default risk in emerging markets (that is, follower economies of the time) against the metric of overall financial integration used earlier, which – unsurprisingly – correlate closely.[46] Again, the decade following the Barings crisis stands out as a period in which foreign investment levels fell and risk premiums on follower economies' borrowing spiked. But as a general rule, investors' perceptions of the risks involved in lending to follower economies were low from 1880 to 1890 and from 1900 to 1913, and that is reflected in the comparatively low risk premiums levied. Accordingly, this too points to an open, integrated global financial system during the 1870-1914 'first wave' of globalization, characterised by large-scale flows of capital from

[46] (Daudin et al., 2010, p. 11; Flandreau et al., 2010, pp. 104-105)

leading economies to follower economies – with subsequent implications for capital formation and catch-up growth.

Labour Mobility, Technology Transfer, and Information Sharing, 1870-1914

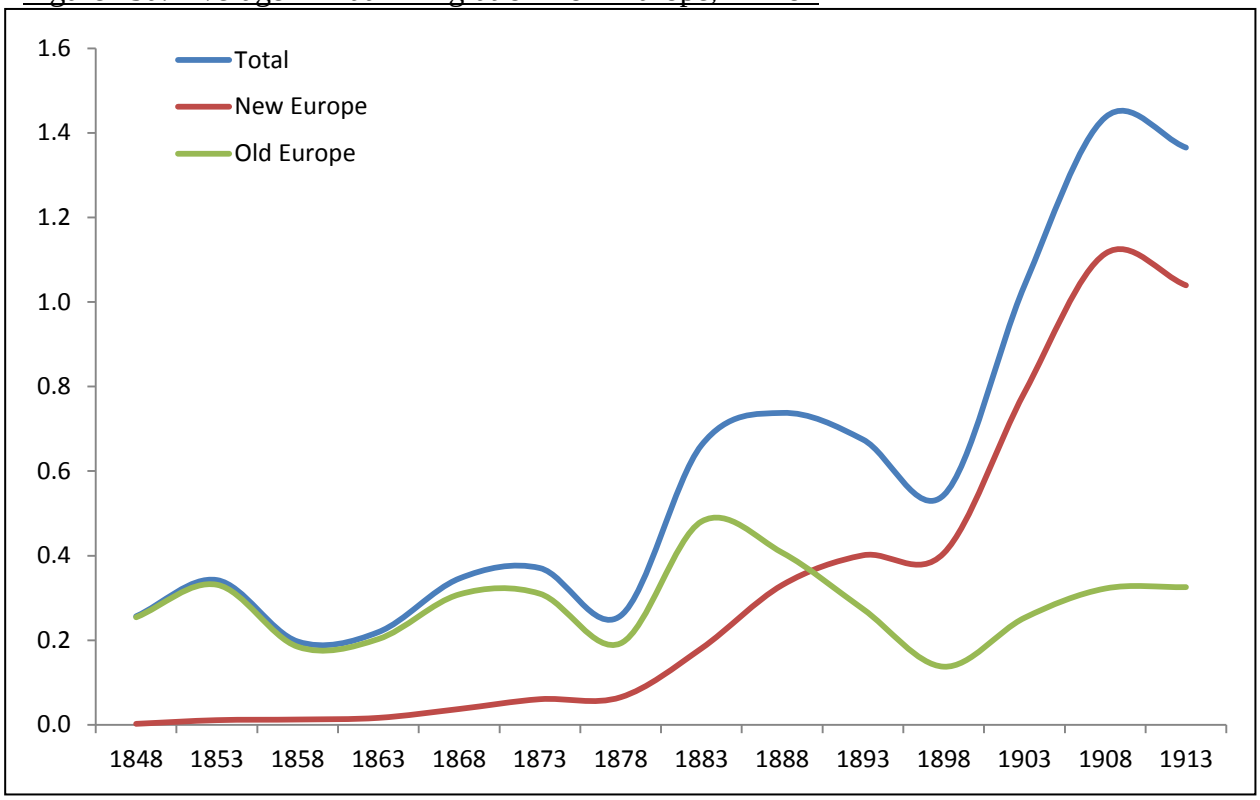
The preceding two sections provided evidence of trade and financial market integration between 1870 and the outbreak of World War I. This section turns to consider evidence of the third crucial aspect of economic integration that can drive catch-up growth under this dissertation's theory: the movement of people and information, and its crucial corollary, technology transfer. Again, returning to figure 1, labour mobility – at least of the long-term migratory kind – was higher in 1870-1914 than it has ever been before or since. Moreover, as this section will show, other forms of information and skill transfer were also elevated during this period.

Turning first to the migration of people, flows of economic migrants – principally out of Europe, in search of a better life in the New World – expanded substantially between 1870 and 1914. Moreover, unlike earlier periods of mass labour movement (most notably in the age of slavery), this migration was predominantly free and market-driven, as workers with at least some level of agricultural or industrial skill sought higher returns for their abilities in areas where such labour was scarce relative to land and natural resources.[47] Indeed, while short-term business and leisure travel – that is, temporary migration – has increased to unprecedented levels in the contemporary era courtesy of the massive expansion of affordable air travel, 1870-1914 remains the high-point of permanent mass economic migration to this day.[48] Not only did migration from the wealthiest areas of 'old' Europe reach new highs (mainly in the 1870s, before falling back somewhat), but migration from Southern and

[47] (Daudin et al., 2010, p. 13)
[48] (Crafts, March 2000, p. 29)

Eastern Europe also expanded spectacularly, with a marked impact on the overall European emigration rate, as figure 19a makes clear.[49]

Figure 19a. Average Annual Emigration from Europe, million



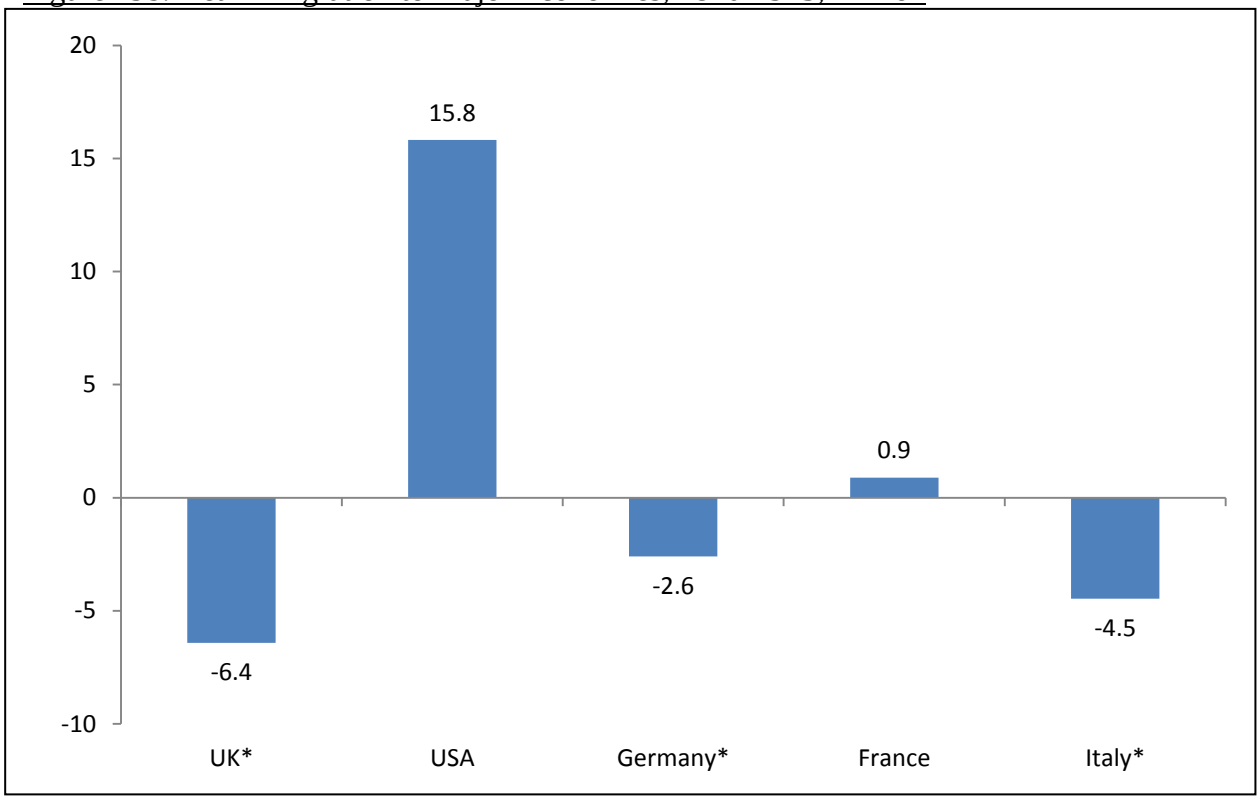
Source: Daudin, Morys, and O'Rourke (2010), Figure 1.2 (p. 14). I thank Kevin O'Rourke for generously sharing this data with me. Note that 'Old' Europe here means Britain and Ireland, Germany, Scandinavia, France, Switzerland, the Netherlands, Belgium, and Luxembourg. 'New' Europe means Italy, Austria-Hungary, Russia, Spain, Portugal, and the Balkans.

Figure 19b summarises the overall net impact on the populations of five major economies of immigration between 1870 and 1913.[50] As can be seen clearly, the principal beneficiary of economic migration during this period was the United States – where land was abundant and labour scarce, in relative terms – which experienced net immigration of 15.8 million over the 43 years.[51] France also experienced net immigration of 900,000. The largest single population outflow country was the United Kingdom – where land was scarce and

[49] (Daudin et al., 2010, p. 14) Note the visible cyclical trend in this chart, as intra-period economic downturns in Europe were accompanied by spikes in emigration outflows to seek better economic conditions elsewhere.
[50] (Maddison, 2003b)
[51] See also (Crafts, March 2000, p. 30)

labour abundant, in relative terms – which experienced net emigration of 6.4 million. Italy and Germany also experienced net emigration, of 4.5 million and 2.6 million respectively. That said, 'Germany' (meaning the then-North German Confederation) received a notable one-shot 'immigration' influx in 1871, when Bavaria, Württemberg, Baden, and the remainder of the Grand Duchy of Hesse were incorporated into what became the German Empire.[52] Accordingly, there is ample evidence to suggest that both aggregate labour stocks and economically important skills were transferred by the international economic integration of 1870-1914.

Figure 19b. Net Immigration to Major Economies, 1870-1913, million



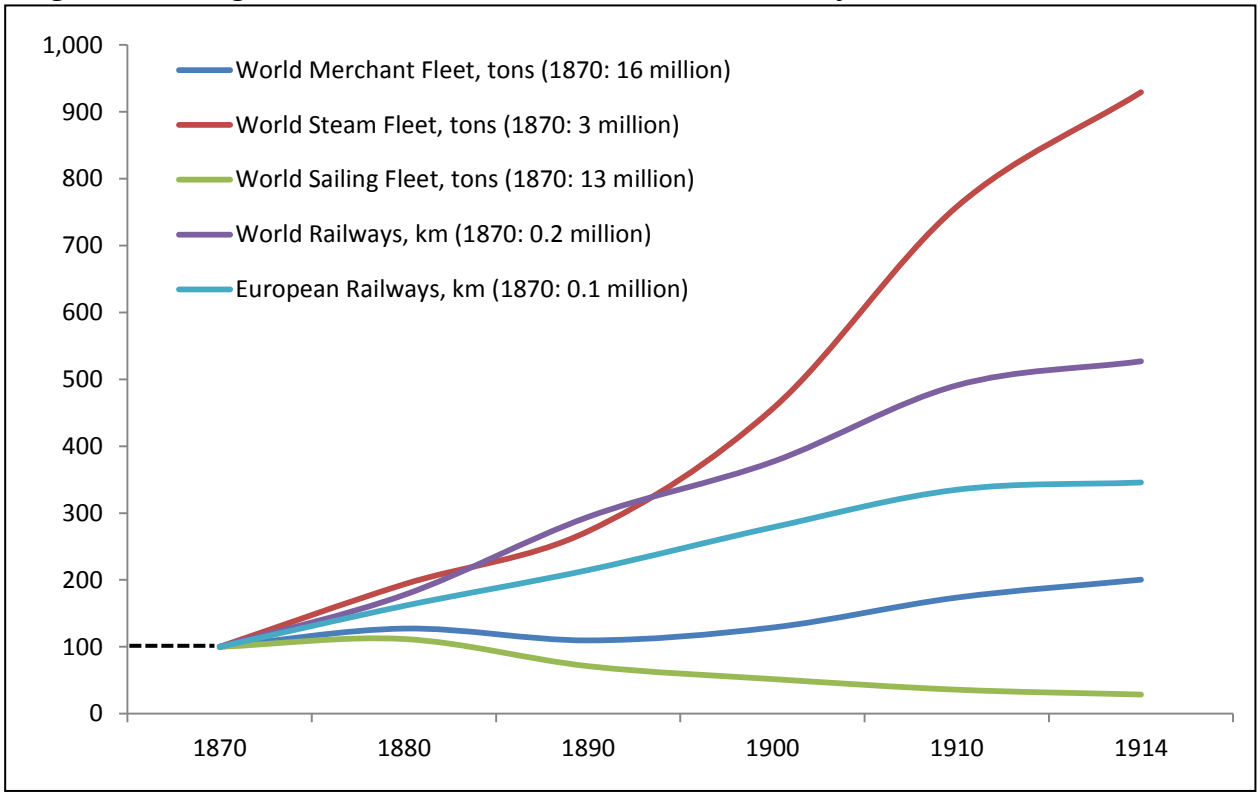
Source: Maddison (2003). *Negative figures denote net emigration.

Progressing from aggregate data on the migration of people to consider broader patterns of global communication, 1870-1914 also witnessed a massive expansion of transport linkages. Of course, this expansion itself existed in a supply-and-demand

[52] (Kennedy, 1980, p. 43)

relationship with human migration, since the fact that a berth in a transatlantic liner was now within the reach of so many Europeans enabled them to emigrate (for example); conversely, there would not have been such an explosion of transport infrastructure had there not been demand for it.[53] Likewise, referring back to the discussion of trade integration above, the integration of global goods markets was both enabled by – and a driver of – the expansion of transport infrastructure.

Figure 20. Change in Size of World Merchant Fleet and Railway Network, 1870=100



Source: Daudin, Morys, and O'Rourke (2010), Figure 1.1 (p. 9). I thank Guillaume Daudin for generously sharing this data with me.

Nonetheless, this phenomenon is still worth referring to in its own right, since it provides another point to consider both in comparison to the relatively less integrated period prior to 1870, and as evidence of how human and physical technology moved both within and out of Europe between 1870 and 1914. Figure 20, therefore, presents data on the expansion of

[53] (Daudin et al., 2010, p. 15)

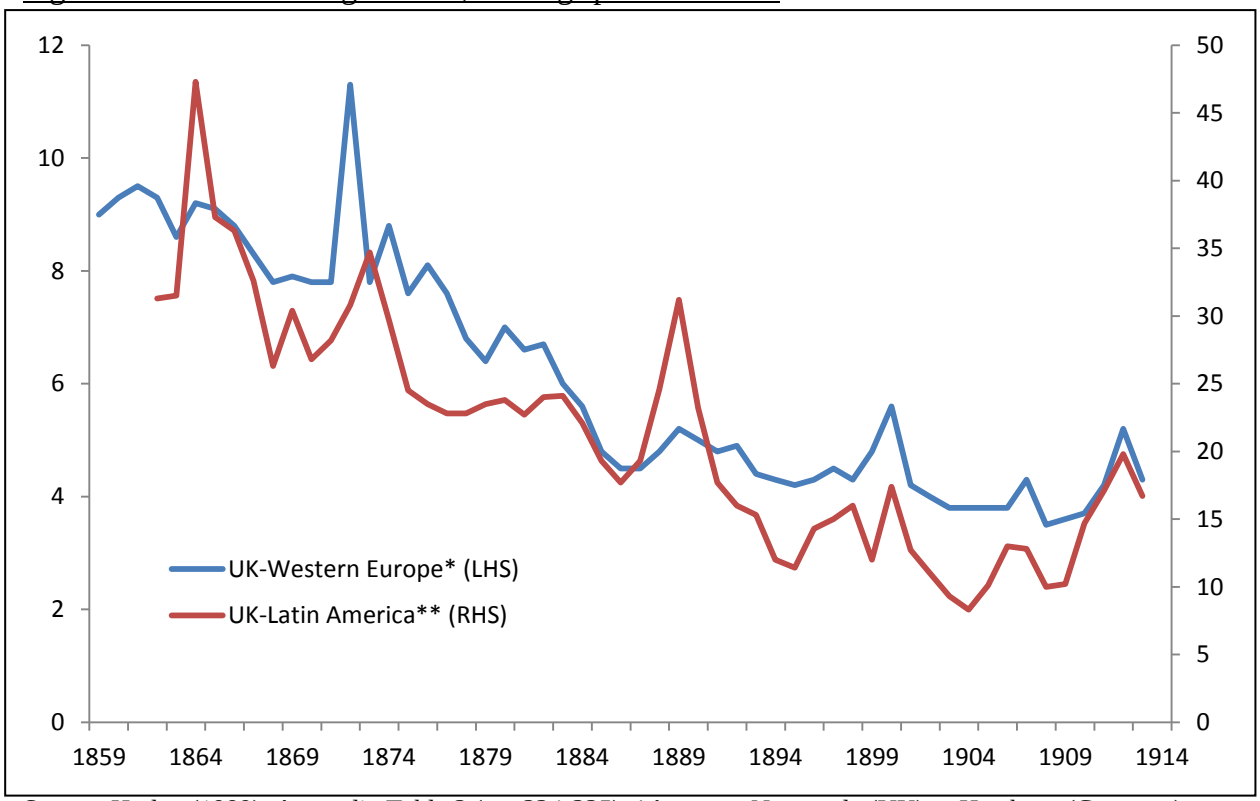
global transport infrastructure over the 44-year period. The most salient points are the massive expansion of the steam-powered merchant marine fleet, the relative demise of the much slower (and usually less spacious) sailing fleet, and the expansion of the railways, both within Europe and in the rest of the world.[54] Further evidence of improving global transport networks and technology-enabled factor movement is contained in figure 21, which charts the price of moving a ton of coal both between the United Kingdom and Western Europe and from the United Kingdom to Latin America (this chart is also highly relevant for the earlier section on trade integration).[55] With shipping costs falling so substantially, the movement of technology of all kinds was well-placed to expand. As such, all of these dynamics point to a more integrated international economy, in which people (with their embedded skills), technology and information moved increasingly freely.

Turning to how integration impacted the spread and dissemination of productivity-raising knowledge, this is clearly a difficult variable to accurately quantify. After all, no country possesses a systematic archival record of 'good ideas that we absorbed from elsewhere.' There are not even systematic records of capital goods trade, which might provide a useful aggregate proxy for technology transfer, although such data is presently being assembled by a leading economic historian.[56] However, it is possible to derive important insights from studying particular historical cases of knowledge-sharing and technology dissemination, and when used in combination, these permit at least a degree of generalization. Accordingly, I next investigate three crucial cases of technology diffusion from the then-leading economy – the United Kingdom – to follower economies that had a profound impact on productivity in these followers. These cases are particularly salient to investigate, because as Guillaume Daudin, Matthias Morys and Kevin O'Rourke note, an increasing share of the total technology transfer that took place between 1870 and 1914 was

[54] (Daudin et al., 2010, p. 9)
[55] (Harley, July 1989, pp. 334-335)
[56] See the earlier reference to Professor Jeffrey Williamson's ongoing data project.

embodied in capital goods, rather than individual know-how.[57] And in all cases, this technology transfer carried major implications for catch-up growth in the follower economies.

Figure 21. Maritime Freight Rates, shillings per ton of coal



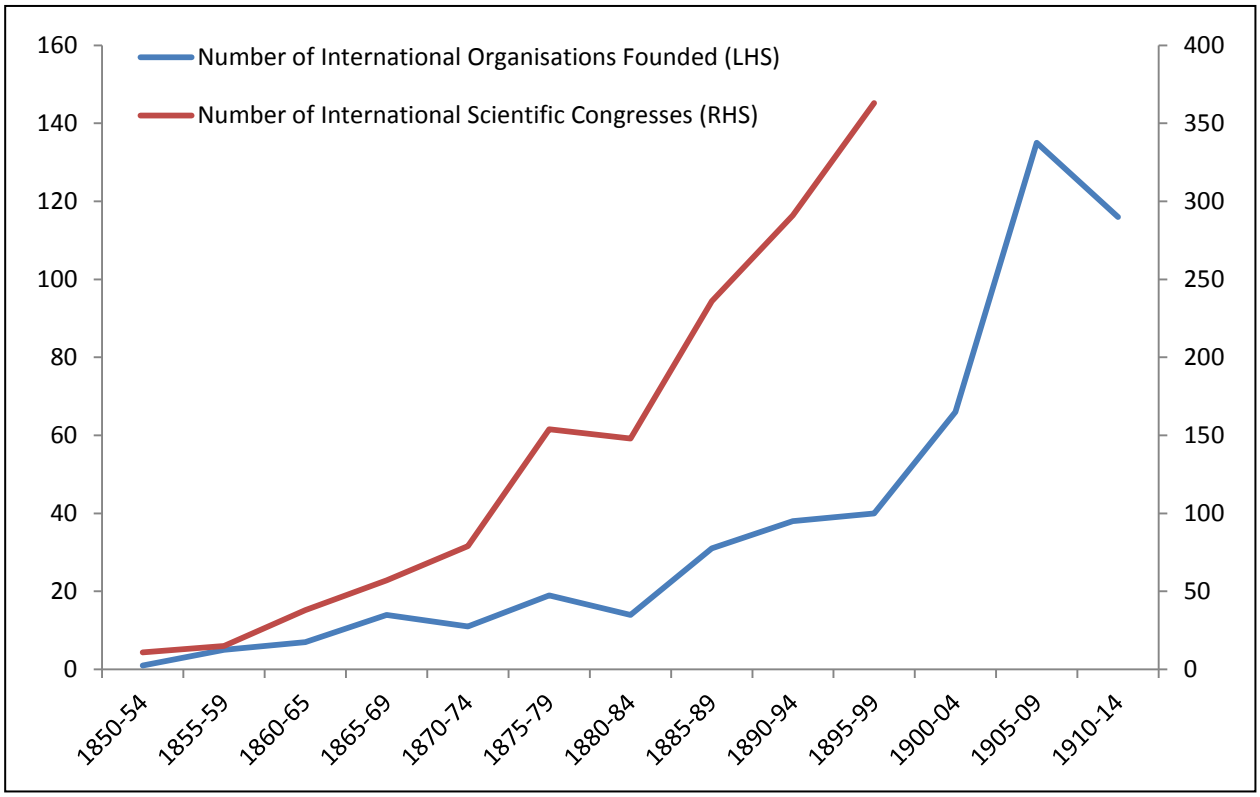
Source: Harley (1989), Appendix Table 3 (pp. 334-335). *Average, Newcastle (UK) to Hamburg (Germany) and Le Havre (France). **Average, Welsh ports (UK) to the River Plate (Argentina/Uruguay). Note that there were 20 shillings in one UK pound sterling, and 12 pence in a shilling, until UK decimalisation in 1971.

Before that, however, it is worth considering one salient metric of technology transfer that *is* available in cross-national time series form: conferences and organisations for the formal sharing of scientific and technical know-how. Figure 22 presents data on the number of international professional-technical organisations founded and the number of international scientific congresses held in each five-year period from 1850 to 1914.[58] As can be clearly seen, international conferences and organisations for the sharing of scientific findings and professional expertise were still rare prior to 1870, but they proliferated rapidly from then on.

[57] (Daudin et al., 2010, p. 17)
[58] (Daudin et al., 2010, pp. 18-19) The scientific congresses data presented here unfortunately does not extend beyond 1899.

Such data therefore provides at least one plausible proxy indicator to suggest that knowledge diffusion picked up during the 1870-1914 period.

Figure 22. International Technical Knowledge-Sharing, 1850-1914



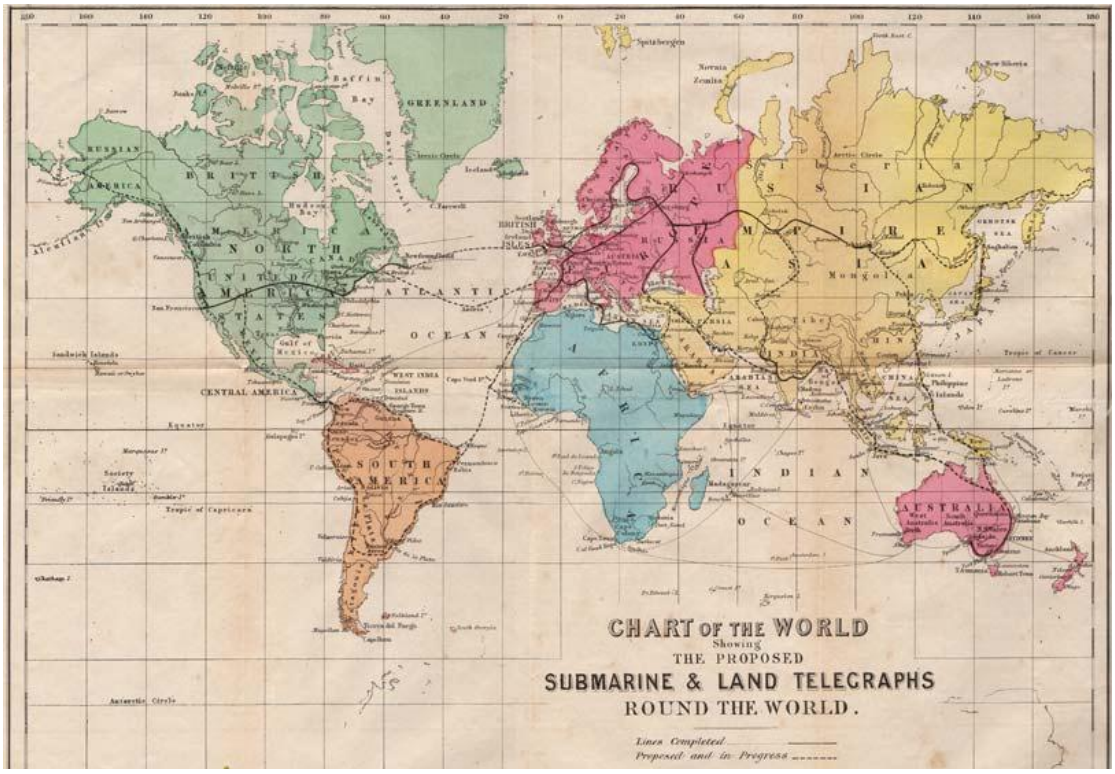
Source: Daudin, Morys, and O'Rourke (2010), Figure 1.4 (p. 18). I thank Guillaume Daudin for generously sharing this data with me. Underlying data from the Union des Associations Internationales.

The first of three key instances of technology diffusion driving catch-up growth to be considered is international telegraphy. Insofar as telegraphy is a technology for sharing information, the impact of its diffusion is likely to have been doubly significant: it could serve not only as an important driver of follower states' productivity gains in its own right, but it also facilitated future innovation diffusion. The world's first commercially operational electrical telegraph was introduced on the UK's Great Western Railway in 1839, and by 1850, the first operational submarine cable – between the United Kingdom and France – had been laid.[59] Technological experimentation with larger distances followed, and by 1870, the

[59] (R. Harrison, 1885; Hubbard, 1965, p. 78)

United Kingdom was connected with India, via the Middle East, and most importantly of all, with North America.[60] A formal organisation for technical coordination and cooperation – the International Telegraph Union – was created in 1865.[61]

Figure 23a. Total Complete and Proposed International Telegraph Cables, 1865



Source: Burns (2009). Image accessed on 15 February 2011 at http://www.atlantic-cable.com/Maps/index.htm.

From then on, telegraphic proliferation followed, as illustrated by the 'before' and 'after' images in figures 23a and 23b.[62] The former shows all existing *and* proposed international electric telegraph routes, as of 1865; the latter shows the extant 1901 connections of a *single* UK telegraph firm, albeit the biggest one, the Eastern Telegraph Company (the forerunner of today's Cable & Wireless). The growth of what Tom Standage

[60] (Glover, 2010)
[61] (Daudin et al., 2010, p. 19)
[62] (Burns, 2009) Dashed lines in figure 23a are cables proposed or in progress, while hard lines are completed cables; all red lines in figure 23b are completed cables within the Eastern Telegraph Company's global network.

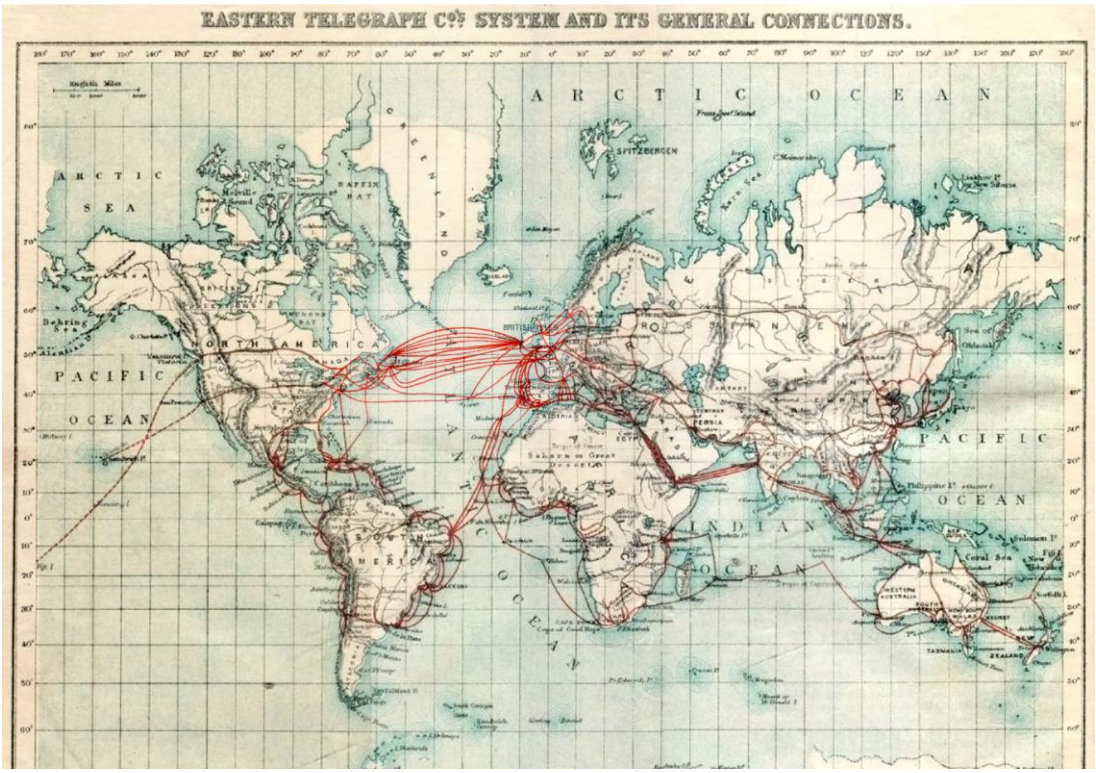
has called the 'Victorian internet' is plain to see between these two images.[63] Moreover, by 1913, this telegraphic activity was being supplemented by rising telephone usage.[64] Part of the catch-up growth driving effects of such telegraphic diffusion tie back to other mechanisms of integration discussed previously. For example, the near-real-time connection of financial markets in London, New York, Paris, and other capitals greatly assisted cross-border investment, while the ability to place goods orders in minutes rather than days or weeks assisted the deepening of trade. Yet beyond these connections to other integration mechanisms, the rapid sharing of large volumes of information and ideas can itself have a substantial independent impact on productivity gains, and thereby on growth. Accordingly, the diffusion and expansion of global telegraphy was a key characteristic of the 1870-1914 period that supports this dissertation's theory.

The next key case of productivity-raising – and subsequent economic balance-shifting – technology diffusion for consideration is the railway: both the steam locomotive, and the mass-produced rail. The first commercially-viable steam engines were introduced to the UK economy from 1712, and played a non-trivial role in the United Kingdom's ascent to industrial dominance by the early nineteenth century.[65] The first self-propelled steam locomotive pulled a train of passengers in Wales in 1804, the first commercially-successful railway was opened in Middleton, Yorkshire, in 1814, while the famous Stockton and Darlington Railway – the world's first public railway – followed in 1825. The 1,435 millimetre rail gauge used by inventor-engineer George Stephenson on the Stockton and Darlington – along with on the Liverpool and Manchester Railway, the world's first inter-city route, which opened in 1830 – remains the international standard gauge.[66] By the 1850s, the railways had transformed the infrastructural face of Britain, providing the speed and carrying

[63] (Standage, 1998)
[64] (Broadberry, Federico, & Klein, 2010, pp. 80-81)
[65] (Kanefsky & Robey, April 1980)
[66] (Simmons & Biddle, 1999)

capacity to sustain and increase UK industrial pre-eminence throughout the early and mid-nineteenth century.

Figure 23b. Completed Eastern Telegraph Company Cables, 1901



Source: Burns (2009). Image accessed on 15 February 2011 at http://www.atlantic-cable.com/Maps/index.htm.

Yet as figure 24 makes clear – and as was already implied by the world and European aggregate railway data in figure 20 – the industrial, social, and military benefits of this innovation did not remain confined to the United Kingdom for long. By 1850, total UK railway track length, at 6,621 miles, had already been surpassed by that of the United States, which possessed 9,021 miles of track – although, of course, the latter was a geographically vast, sparsely populated country, in which infrastructural development was a much more serious imperative of state-building.[67] More significantly from a European balance-of-power perspective, after 1870, the United Kingdom's railway lead over the rest of the major powers was also eroded, such that by 1910, it possessed less track length than all other major powers,

[67] (O'Rourke & Williamson, 1999, p. 34)

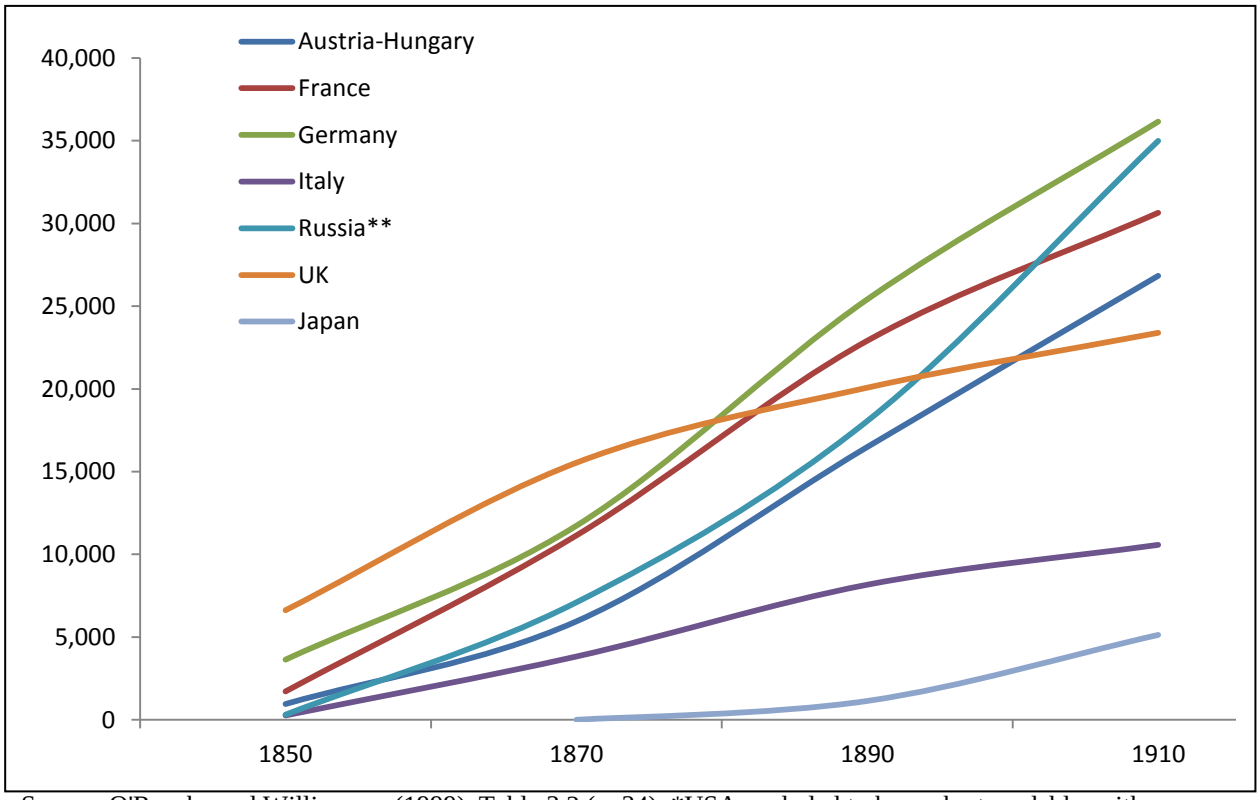
with the exceptions of comparatively-underdeveloped Italy and Japan. Again, such a finding must be qualified by the fact that the United Kingdom is relatively small in geographical terms, with most of its key industrial centres in relatively close proximity and already enjoying relatively developed connecting infrastructure. Also, as an island with numerous ports and a developed canal network, there was greater capacity to move freight by water. Nevertheless, this comparative data tells a story that is highly salient for this dissertation's theory: the diffusion of a UK technological innovation, via exports and other forms of knowledge-transfer, led in turn to the demise of Britain's infrastructural lead – and in the process, facilitated the erosion of British industrial supremacy.[68] An identical story can be told of the steam ship – a related UK innovation – given its role in opening and expanding transatlantic and Asian trade, the US Mississippi Basin and Great Lakes, and Western and Central European riverine and canal-based commerce.

A final case of world economic balance-shifting technology diffusion during 1870-1914 is steel-making in what gets called the 'second industrial revolution' – a period usually accepted to coincide with the 1870-1914 globalization wave.[69] By the middle of the nineteenth century, wrought iron was the principal industrial metal, but it was less-than-perfect for many of the tasks being asked of it, due to a lack of resilience and elasticity. Steel was known to be superior, but while making steel was not a problem, making it cheaply enough to be economical in bulk had long proven a challenge.[70] The challenge was definitively overcome in 1856, when Henry Bessemer, a British engineer, developed a conversion process to which he lent his name, and thus invented the first inexpensive means for the mass-production of steel; steel that while of initially poor quality, was improved by

[68] The United Kingdom was a major exporter of locomotives and rails; moreover, in addition to 'general' technology sharing in the form of free dissemination of technical know-how, UK financiers were also major investors in follower economies' railroad projects, as a consequence of the potential profits to be made when opening-up large tracts of previously under-utilised territory: (Daudin et al., 2010, p. 13; Kennedy, 1980, p. 41)
[69] (Mokyr, 1999, p. 1)
[70] (Mokyr, 1999, p. 2)

the addition of an alloy, developed by Robert Mushet – another UK engineer. Meanwhile, the German-developed Siemens-Martin open hearth process for producing cheap steel (invented shortly after the Bessemer converter) suffered from its own quality problems – until two British inventors, Percy Gilchrist and Sidney Thomas, hit upon the solution of adding limestone to the firebricks used in the Siemens-Martin approach in 1878. The result of these two innovations was that from the 1870s onwards, steel use expanded across the industrial world, replacing wrought iron wherever a more tenacious bulk metal was required, and thereby permitting great leaps of engineering in such spheres as ship- and bridge-building.[71]

Figure 24. Major Powers' Railway Mileage*



Source: O'Rourke and Williamson (1999), Table 3.2 (p. 34). *USA excluded to keep chart readable: with 116,703 miles in 1890 and 249,902 miles in 1910, US railroad by the end of the period outstripped that of its closest follower by more than a factor of seven. **European Russia; Asian Russia data not included in series.

Crucially, however, these innovations did not keep the UK steel industry ahead for long. German steel industrial management was already superior to the United Kingdom's,

[71] (Mokyr, 1999, p. 3)

meaning that once Gilchrist-Thomas method was incorporated – as it swiftly was from the 1880s onwards, courtesy of European technology sharing – German steel plants began to out-compete their UK counterparts, as will be demonstrated later in this chapter.[72] Joel Mokyr concludes of the Gilchrist-Thomas addition that, 'It seems safe to say that the German steel industry could never have developed as it did without this invention.'[73] Meanwhile, the Bessemer process was adopted, absorbed, and widely disseminated – with additional refinements – across North America.[74] The result was that the United States had abundant cheap steel with which to both drive and supply its late nineteenth century and early twentieth century industrial boom, and US steel output comprehensively outstripped UK production – despite the latter being the source of the original innovation – from 1900 onwards, as will also be shown below. In short, the 1870-1914 steel industry appears to represent another case of leading-economy technology diffusion in a crucial industrial sector facilitating the erosion of its own inventor-state's industrial lead.

Ultimately, however, these are simply three particularly 'iconic' cases; they represent lone data points extracted from 44 years of profound economic change. Such cases – all essentially focussed on the relationship between the United Kingdom and its two principal industrial competitors, the United States and Germany – omit a wider tapestry of international knowledge exchange. For example, Japan can be pointed to as a particularly avid technological 'learner' during this period, which goes a long way to explain its spectacular gains in its share of world trade documented earlier; indeed, following the Meiji Restoration of 1868, Japan embarked on a self-conscious effort to assimilate Western ideas and technological advances.[75] Moreover, to take too unidirectional an approach – viewing the

[72] (Kennedy, 1980, p. 55) It is important to note, however, that natural resource endowments also played a role here, since the open hearth process – at least after the addition of the Gilchrist-Thomas method – was able to make use of the phosphorous-rich iron ores more prevalent in continental Europe: (Mokyr, 1999, p. 3)
[73] (Mokyr, 1999, p. 3)
[74] (Misa, 1995)
[75] (Daudin et al., 2010, pp. 206-209; Kennedy, 1987)

United Kingdom as the technology sender, with everyone else as technology recipients – obscures salient interactive technology dyads. For example, Germany was already the world's leading innovator in the chemical sector by the 1840s, while the United States was a great innovator in general; to discuss nineteenth century technological discovery and dissemination without reference to the likes of Thomas Edison, Louis Pasteur or Robert Koch would be a grave and unjust over-simplification.[76] Accordingly, the *really* important point here is that in a world of *generally* open commerce and communications, as 1870-1914 has been shown to be, the untold millions of productivity gains – both small and large – made around the world are quickly disseminated and absorbed. And insofar as this can reduce the technological gaps between the most advanced economies and the rest, it leaves those states with lower overall development levels better placed to enjoy catch-up growth than they would be in a world of autarky.

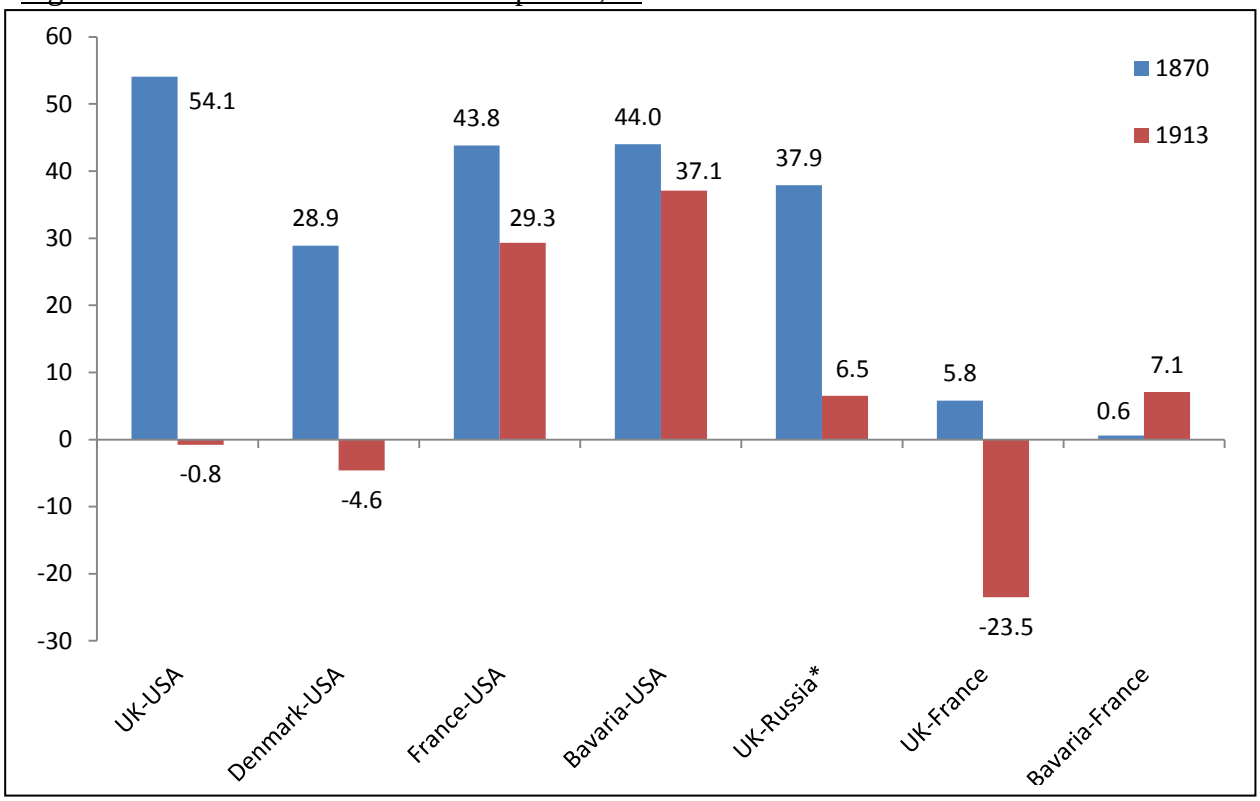
Other Convergence Evidence of Factor Market Integration, 1870-1914

Before progressing to consider the overall impact of integration on different national growth patterns, I here pause to consider two other pieces of integration evidence that do not fit neatly into the trade, finance or technology categories, because they are affected by all three. As such, these two pieces of evidence – both variations of factor-price convergence – can be taken as further supportive evidence that integration in the three categories discussed above was indeed at work.

First, figure 25 presents data on the gap between the wheat prices of a number of significant states in 1870 and 1913.[77] As can be clearly seen, most of the price spreads display compression over the 43-year period, with this compression being so marked as to amount to near-complete convergence in a number of cases. Most obviously, the transatlantic

[76] (Daudin et al., 2010, pp. 17-19; Mokyr, 1999, pp. 3-14)
[77] (O'Rourke & Williamson, 1999, p. 104)

Figure 25. International Wheat Price Spreads, %



Source: O'Rourke and Williamson (1999), Table 6.3 (p. 104). *Russia here refers to Odessa, in Ukraine; while Ukraine was not an independent country during this time, it was the principal wheat-producing area of the Russian Empire, and Odessa subsequently represented the major Eastern European grain market.

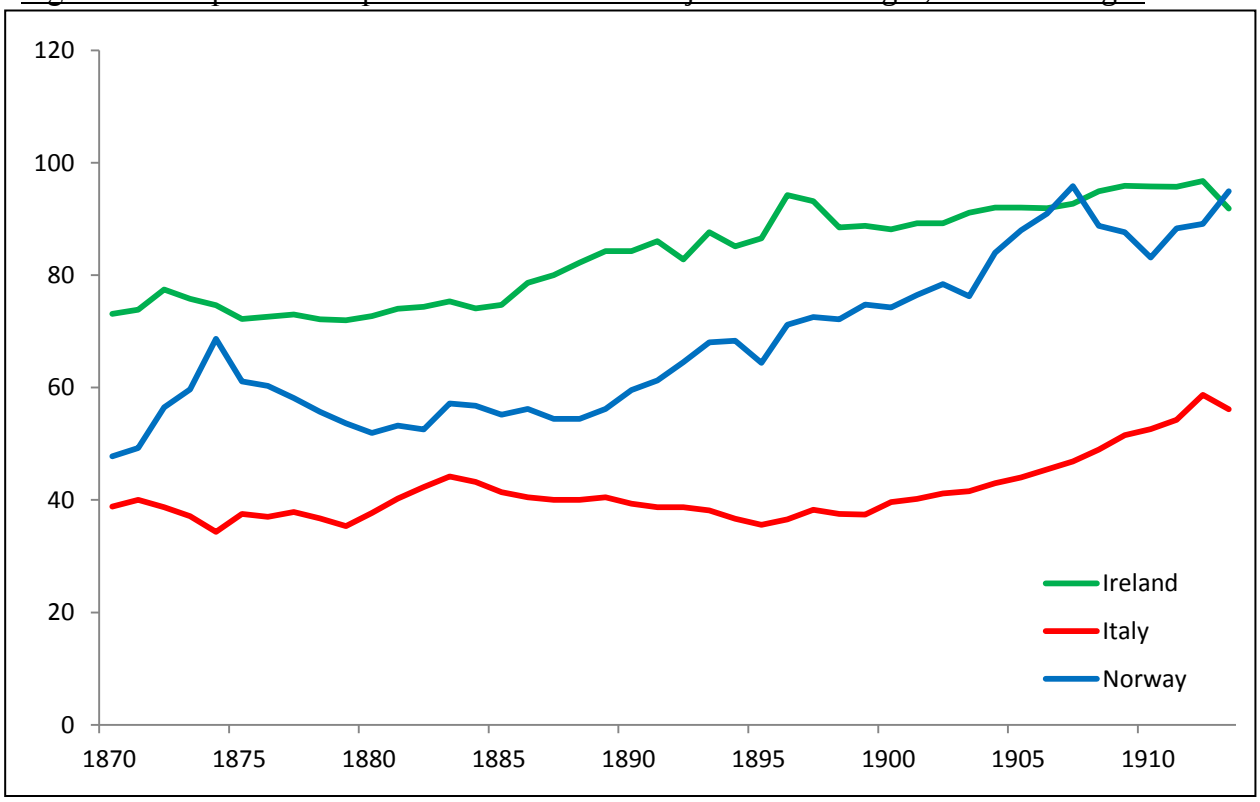
price gap between the two major English-speaking economies disappears almost entirely, and a similar thing happens to the Denmark-US and UK-Russian Empire spreads. There are noteworthy exceptions to this general pattern, insofar as some spreads have not compressed by as much as may have been expected while others have actually widened – and as will be discussed later in this chapter, in the section on caveats to the overall findings, this owes amongst other things to certain continental European states' tariff responses to a domestic political anti-globalization backlash. Crucially, however, as Kevin O'Rourke and Jeffrey Williamson observe, tariff responses in general were not sufficient to overcome the powerful price-equalising forces of goods-, capital-, and technology-market integration.[78]

Moving to a different category of factor price, figure 26 presents data on the real wage gap between Great Britain and three relatively peripheral European economies – Ireland (then

[78] (O'Rourke & Williamson, 1999, p. 101)

part of the UK), Italy, and Norway – over the 1870-1913 period.[79] Again, we observe marked spread compression over the 43-year timeframe, with all three countries' wages converging on those of the British leader; indeed, in the Irish and Norwegian cases, the spread between home wages and UK mainland wages all but disappears. And again, this is supportive of the broader discussion conducted previously: as goods, capital and skills flowed freely (for example, after the exodus of Italian workers to the United States), factor prices for labour converged between leading and following economies, providing further evidence of marked international economic integration between 1870 and 1914.

Figure 26. Peripheral European Economies' PPP-adjusted Real Wages, % of UK wages



Source: Daudin, Morys, and O'Rourke (2010), Figure 1.5 (p. 21). I thank Kevin O'Rourke for generously sharing this data with me. 'PPP' stands for purchasing power parity, a metric of domestic wages' buying power.

[79] (Daudin et al., 2010, p. 21)

The Economic Impact: The Effects of Integration on Productivity, Per Capita Wealth, and National Economic Size, 1870-1914

The previous section of this chapter demonstrated comprehensively that there was indeed substantial international economic integration during the 1870-1914 period, and attempted where possible to process-trace the mechanisms by which such integration could facilitate catch-up growth. This section now turns to the next essential step in the chapter's overall congruence test: demonstrating that follower economies caught-up with the start-of-period leader in terms of productivity, per capita wealth, and ultimately, national economic size.

Labour and Total Factor Productivity Growth, 1870-1914

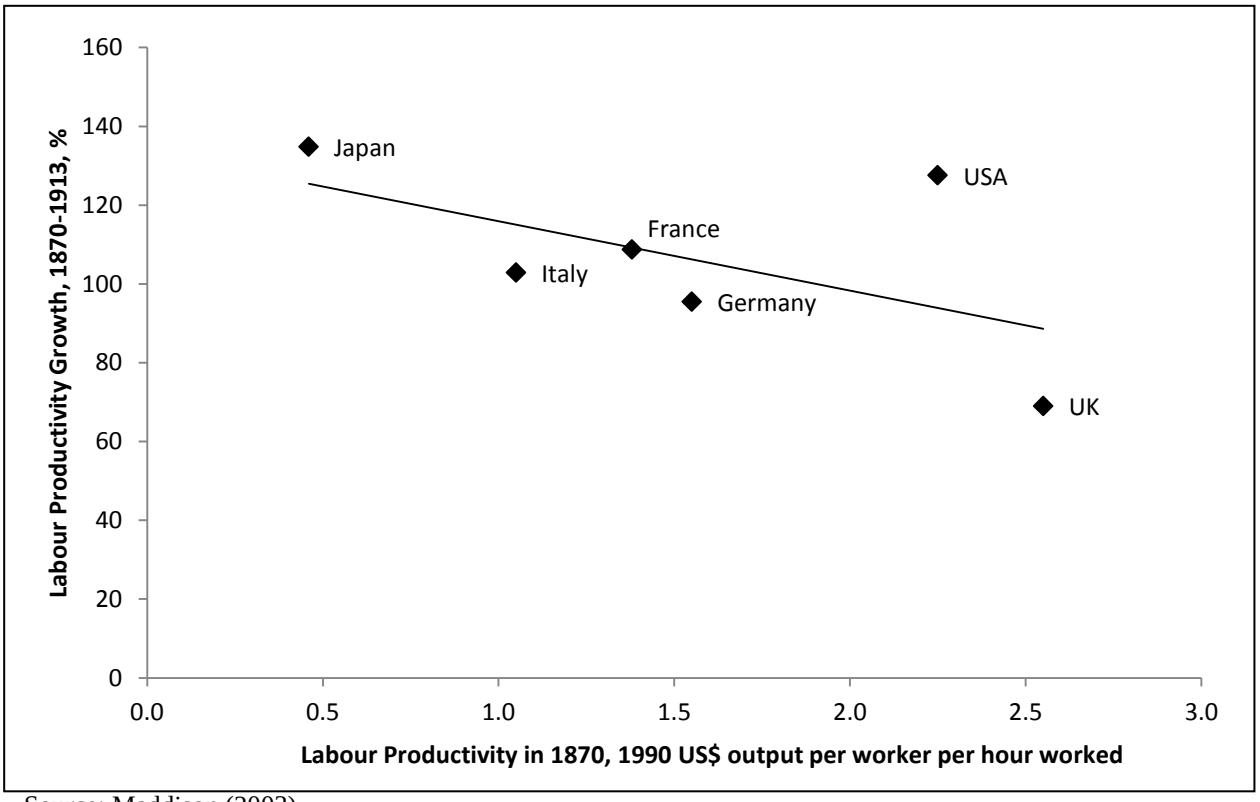
Figure 27 presents data on the labour productivity of all major powers between 1870 and 1913 (with the exceptions of Russia and Austria-Hungary, for which data was not available).[80] In accordance with its position as the most industrially developed economy in the world, the United Kingdom was the most productive economy in the world in 1870, producing $2.55 (in 1990 dollar terms) of GDP for every hour worked. It was followed by the United States, at $2.25/hour, and was more than half as productive again than Germany ($1.55/hour).

Yet over the 43-year period to 1913, UK labour productivity grew by far the smallest amount out of any of the countries in this data series, as figure 27 also shows. The next lowest – Germany – still experienced growth of nearly 30 percent more than Britain, while the United States and Japan both posted particularly impressive figures, of 128 and 135 percent respectively. The result was that by the eve of World War I, the labour productivity of all of the major powers had converged towards that of the United Kingdom – and indeed,

[80] (Maddison, 2003b)

US labour productivity had surpassed that of the former industrial leader. Such a pattern is entirely consistent with the catch-up convergence processes described above, insofar as improvements to the capital stock and national technological base of follower economies – which are in turn facilitated by the free flow of goods, finance and skills – raise the output of each individual worker.

Figure 27. Major Powers' Start-of-Period Labour Productivity and Through-Period Growth



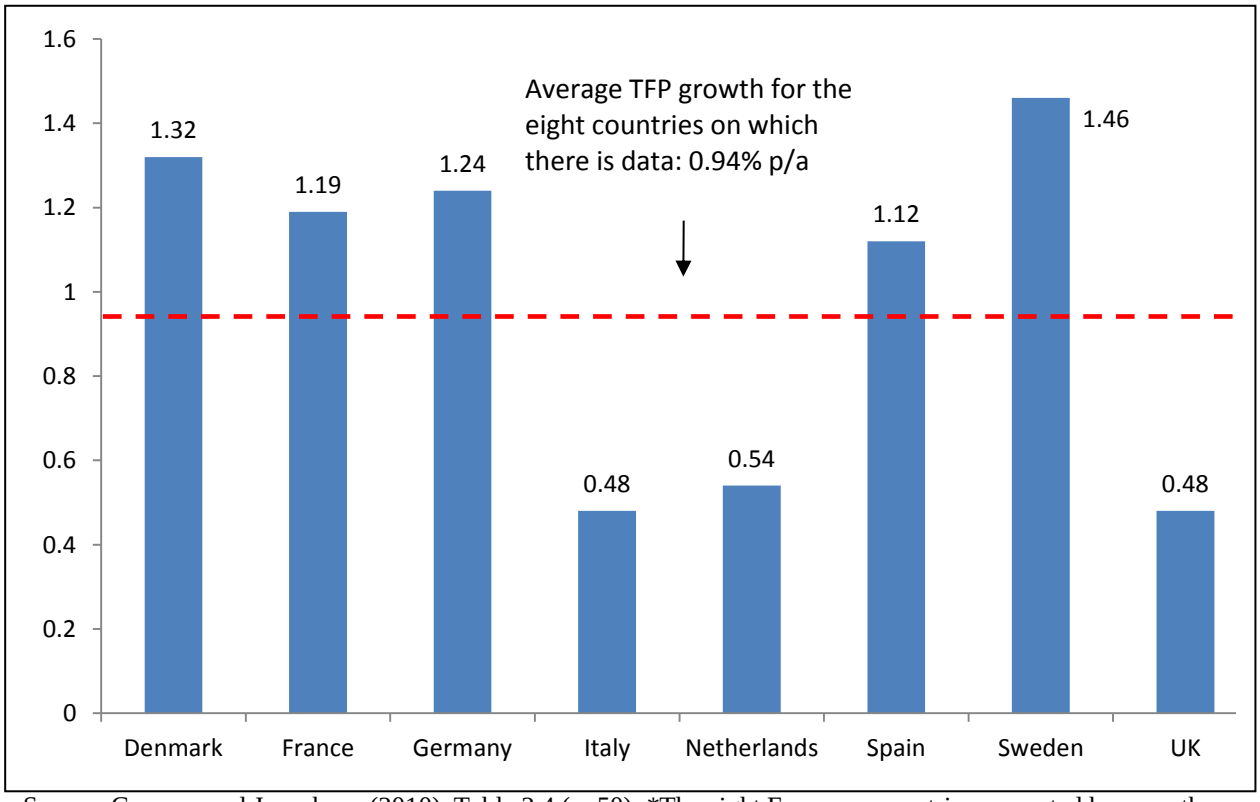
Source: Maddison (2003).

Moving from labour specifically to consider total factor productivity (TFP) – that is, the 'technological residual' in the growth accounting equation – we should again expect to see follower economies catching up with the United Kingdom. Is this expectation borne-out by the evidence? Figure 28 suggests that it is.[81] Here we see that of the eight European countries for which there is sufficient data available to calculate a sufficiently accurate 1870-1913 TFP growth estimate, the United Kingdom posted the joint lowest average annual

[81] (Carreras & Josephson, 2010, p. 50)

growth over the 43 years (tied with Italy, on 0.48 percent). Of the four Western European great powers (charitably coding Italy as great during this period), Germany displayed the most impressive TFP gains. Again, given the technology-sharing and capital-transferring demonstrated to have occurred during the 1870-1913 period, this is consistent with the idea that follower economies TFP can catch-up with that of the leader under conditions of economic integration.

Figure 28. Annual Average European Total Factor Productivity Growth, 1870-1913, %*



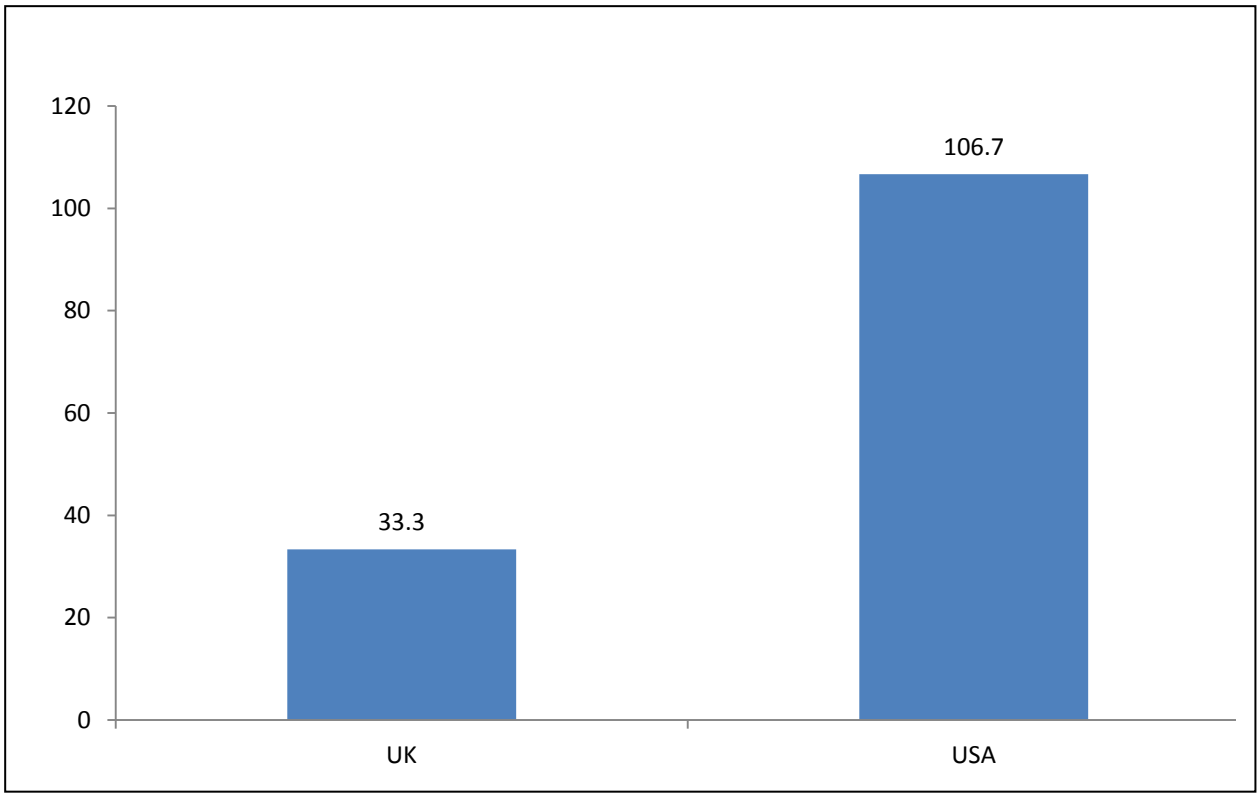
Source: Carreras and Josephson (2010), Table 2.4 (p. 50). *The eight European countries presented here are the only ones for which there is sufficient GDP, population, employment and capital stock data to calculate a reliable TFP figure.

On the catching-up and overtaking of UK productivity by the United States specifically, figure 29 provides data on the shift out of agriculture and into the industrial and service sectors in each country between 1820 and 1890.[82] As is to be expected, both countries

[82] (Maddison, 2003b) Unfortunately, 1820 and 1890 were the only data points available here, meaning that the United States' gains cannot be attributed solely to the post-1870 era; moreover, to attempt to narrowly categorise US industrialisation in such a way would clearly be excessively simplistic. Nonetheless, given that

displayed a shift into these higher-output sectors as development proceeds. However, the overall size of the shift was much larger in the United States, as the chart makes clear. Insofar as this shift was facilitated by the economic integration mechanisms detailed above, this is also consistent with the overall theory.

Figure 29. Growth of Industrial and Service Employment as a Proportion of the UK and US Labour Forces, 1820-1890, %



Source: My calculations, based on data in Maddison (2003).

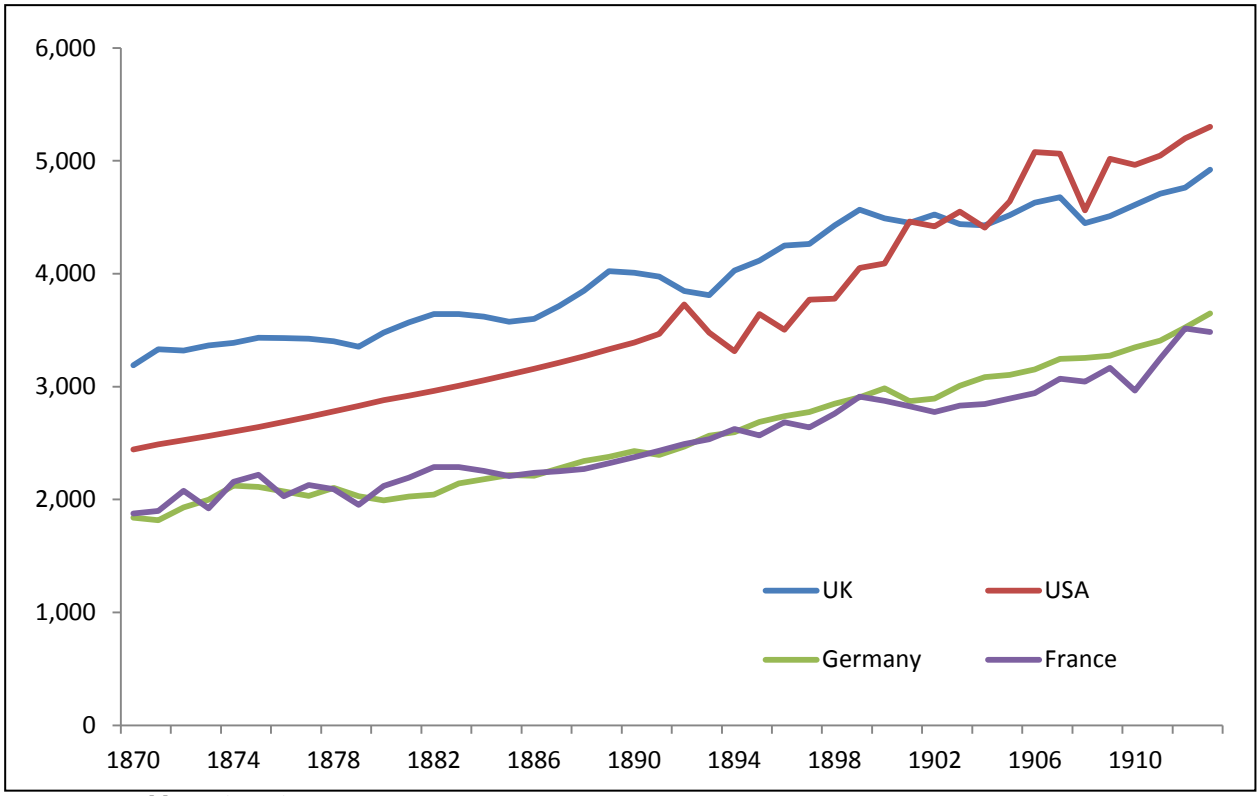
Changes in Per Capita GDP and National Economic Size, 1870-1914

Was this erosion of the United Kingdom's productivity lead reflected in the overall GDP data? This section presents evidence that it was, and on a dramatic scale. The United Kingdom had never possessed the largest population of the major economies; its overall superiority from a total national GDP perspective at the start of the 1870-1914 period owed to

1890 falls twenty years into this chapter's case purview, it seems plausible to suppose that at least some of the shift occurred during the post-1870 globalization wave, even if it had started before this.

its markedly superior levels of per capita output. Accordingly, once the labour and total factor productivity of follower economies started to converge on the British level, other powers' GDP per capita began to catch-up with that of the UK leader. And once that happened, given other powers' larger populations, it was inevitable that the United Kingdom's total national economic output would be matched and ultimately surpassed (see also figure 40).

Figure 30a. Selected Major Powers' GDP per Capita, 1990 US$



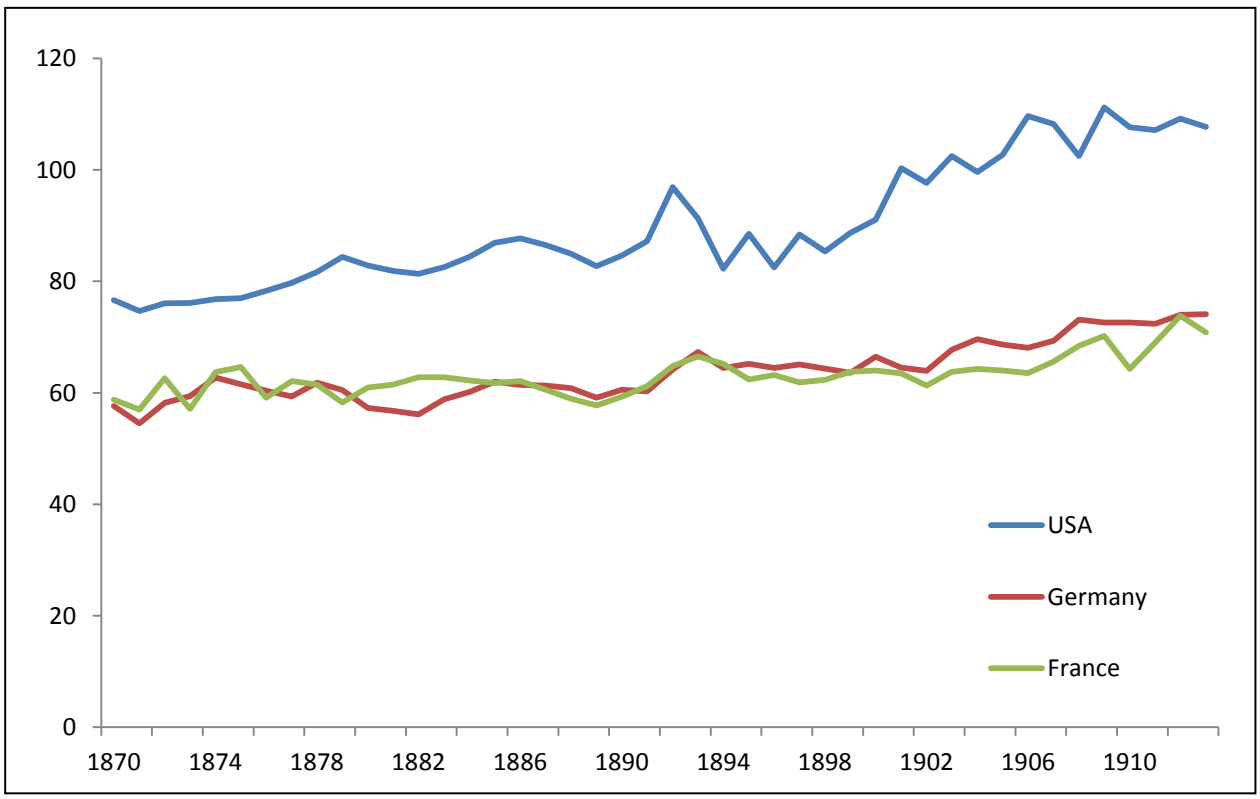
Source: Maddison (2003).

Figure 30a presents data on the evolution of the four most developed major powers' GDP per capita level in 1990 US dollar terms from 1870 to 1913.[83] In 1870, UK GDP per capita stood at $3,190, the US figure was $2,445, France had $1,876, while the German figure was $1,839. By 1913, the UK figure had increased to $4,927, the US level was $5,301, France had $3,485, and the German figure stood at $3,648. Accordingly, all major powers'

[83] (Maddison, 2003b)

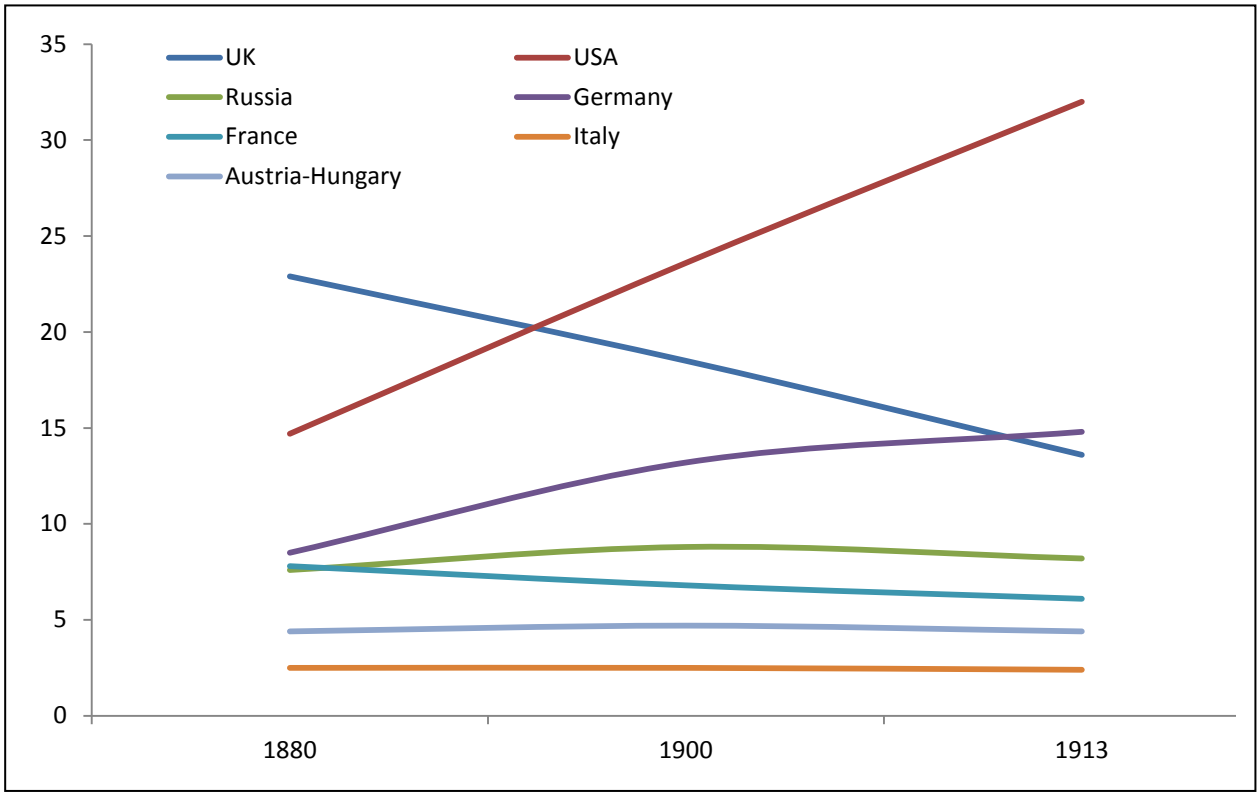
GDP per capita grew impressively, but the follower economies grew by more. Figure 30b summarises the impact that this growth had on the United States, Germany and France's share of UK GDP per capita. In 1870, US GDP per capita amounted to 76.6 percent of the British level, while France's stood at 58.8 percent and Germany's at 57.6 percent. By 1913, all three had either narrowed or wholly close the gap with the United Kingdom: the US figure had increased to 107.7 percent, France's stood at 70.8 percent, and Germany's had increased to 74.1 percent.

Figure 30b. Selected Follower Economies' GDP per Capita, % of UK GDP per capita



Source: My calculations, based on data in Maddison (2003).

Figure 31. Major Powers' Share of World Manufacturing Output, %



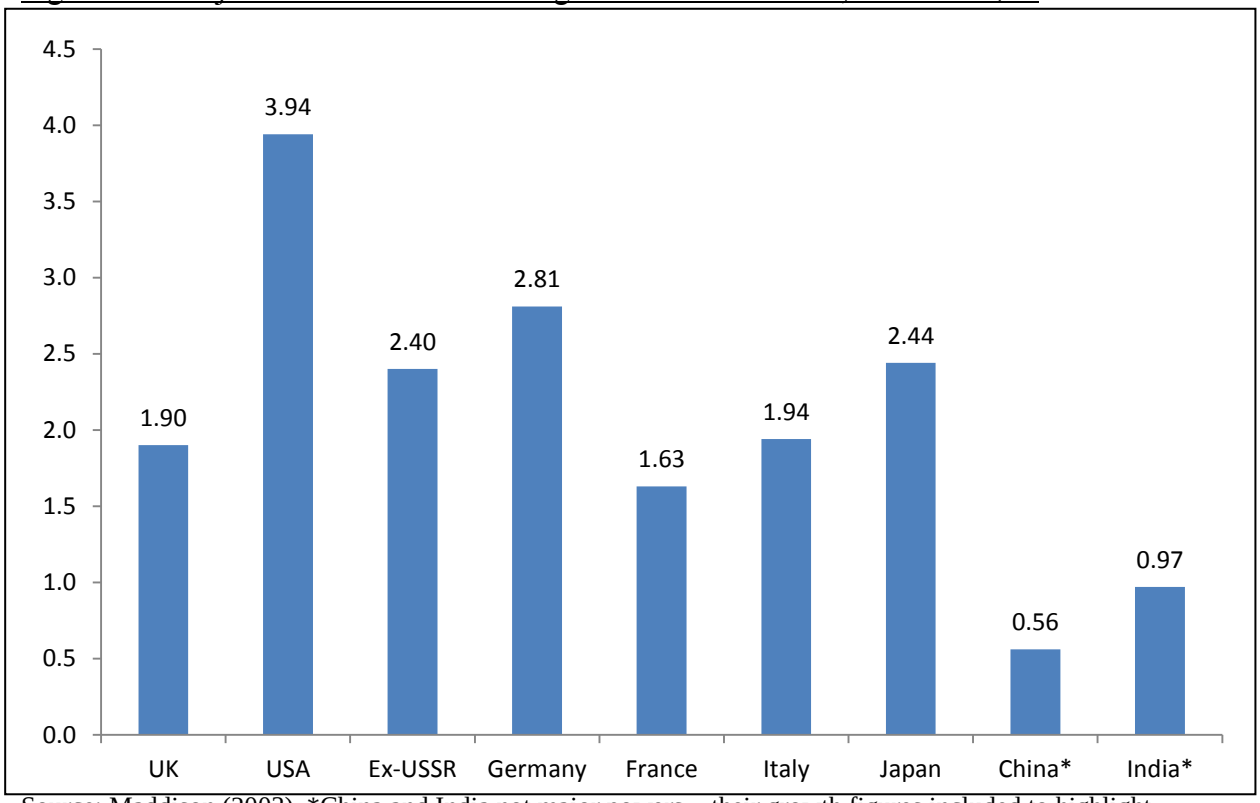
Source: Kennedy (1987), Table 18 (p. 202).

Figure 31 considers how these differing relative development patterns were reflected in shares of world manufacturing output.[84] Again, the pattern is clear. In 1880, the United Kingdom possessed a 22.9 percent share of world manufacturing output, but by 1913, this had declined to 13.6 percent. The United States' share increased from 14.7 percent to 32.0 percent over the same period. Meanwhile, France declined from a position of near-parity with Germany in 1880 – 7.8 percent against Germany's 8.5 percent – to less than half of German output levels, with 6.1 percent in 1913 against Germany's 14.8 percent (the second-highest output level of any major power, ahead of the United Kingdom but behind the United States). Russia's share increased modestly over the 33 years, from 7.6 percent to 8.2 percent. Italy and Austria-Hungary remained the weakest members of the European major power club, with Italy's share falling from 2.5 percent to 2.4 percent between 1880 and 1913, and Austria-

[84] (Kennedy, 1987, p. 202)

Hungary's remaining unchanged at 4.4 percent over the same period.[85] In short, dynamic differentials in the manufacturing output growth of the major powers comprehensively shifted the balance of industrial strength, with particularly salient results in Europe.

Figure 32a. Major Powers' Annual Average GDP Growth Rates, 1870-1913, %



Source: Maddison (2003). *China and India not major powers – their growth figures included to highlight relative dynamism of industrial world.

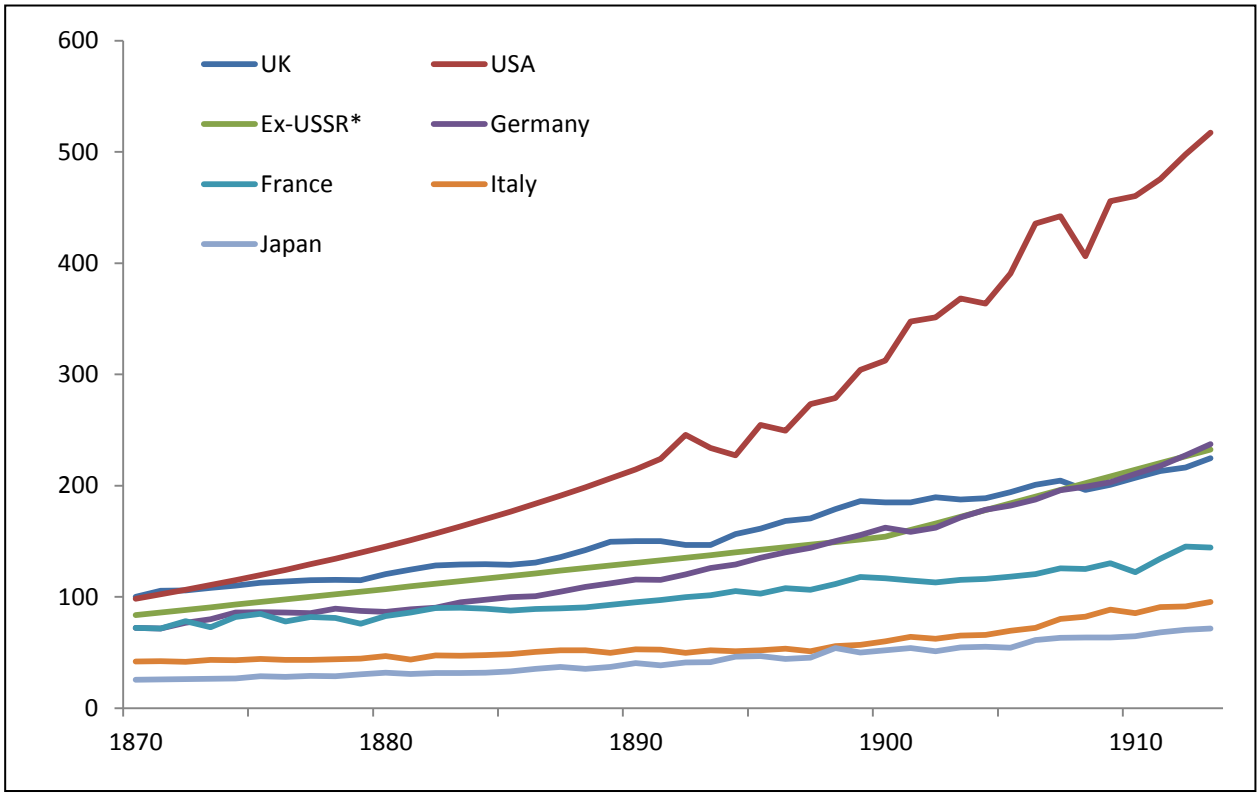
What was the impact of these differing relative development patterns on overall national economic output? Figures 32a to 32e provide the answers.[86] The United Kingdom and France were the slowest growing of all of the major powers in total national GDP terms between 1870 and 1913, as figure 32a makes clear, posting average annual growth of 1.9 and

[85] As noted earlier, the Maddison data's use of the contemporary borders of states makes Austria-Hungary a harder case to assess. Nonetheless, as figure 3 demonstrated, it was among the least trade integrated of the major powers. Moreover, as the fiscal data presented in figure 47 demonstrates, it was a state with sufficient internal economic problems to leave it ill-placed to harness the benefits of catch-up growth potential that the trade expansion outlined in figure 4 might have made possible – and sure enough, as an array of data from figure 31 onwards makes clear, it suffered industrial atrophy as a consequence that was subsequently manifested as a decline in relative power. This relative decline is particularly significant, given Germany's belief by 1914 that Austria-Hungary was a weak ally and insufficient counterweight to Russia, which was in turn influential in the security dilemma dynamics that produced World War I.

[86] (Maddison, 2003b)

1.6 percent respectively. By contrast, the United States posted annual growth of 3.9 percent, German growth averaged 2.8 percent, and both Japan and Russia saw average annual growth of 2.4 percent.

Figure 32b. Major Powers' GDP, 1990 US$ billion

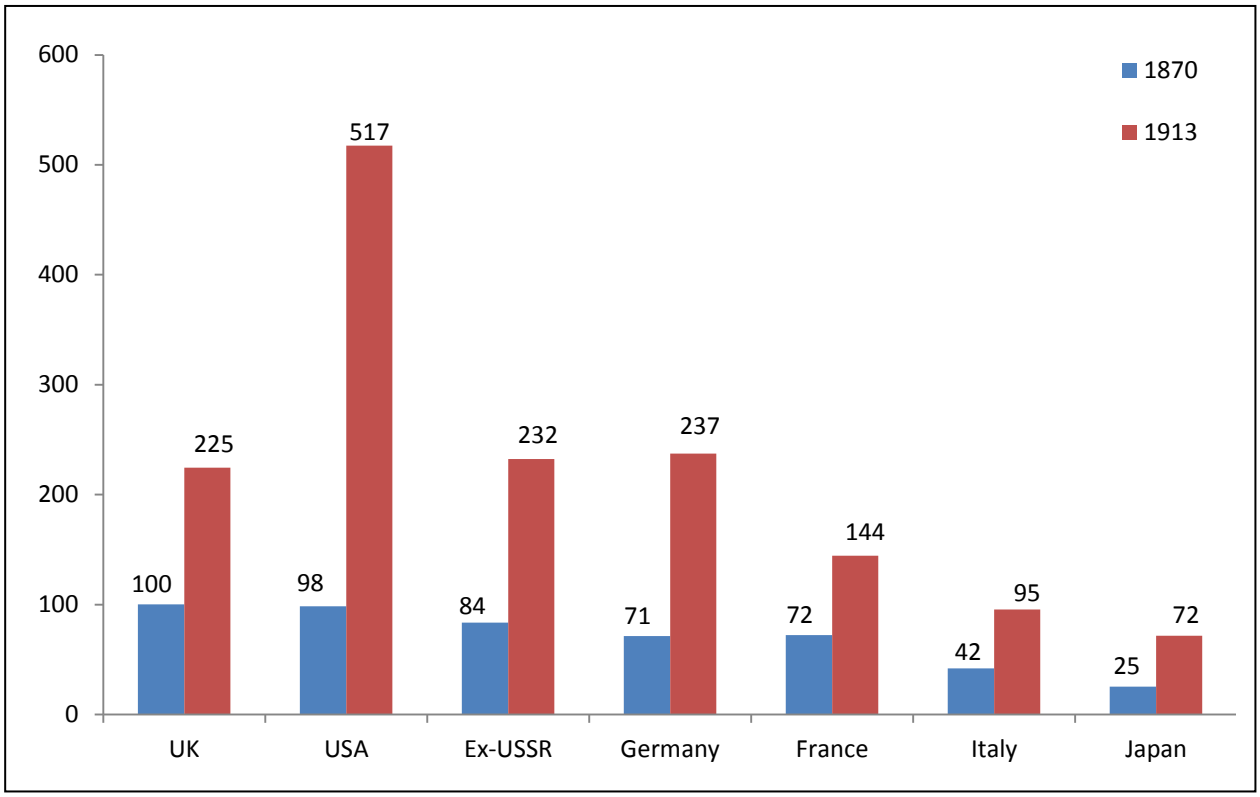


Source: Maddison (2003). *Former USSR data only available for 1870, 1900 and 1913 – all other values generated by interpolating between existing data points.

Figures 32b and 32c lay out what these differing growth rates meant for output in 1990 US dollar terms. The United Kingdom possessed a slim lead in total output as of 1870, with a GDP of $100 billion – compared to the United States' $98 billion, Russia's $84 billion, France's $72 billion, Germany's $71 billion, Italy's $42 billion and Japan's $25 billion. By 1913, however, the United Kingdom was only the world's fourth-largest economy. Salient dynamics include US GDP expanding to be more than double the size of its nearest follower, and most importantly from a European balance-of-power perspective,

Germany overtaking the United Kingdom and Russia – and comprehensively outstripping France – to become the world's second-largest economy.

Figure 32c. Major Powers' GDP, 1990 US$ billion

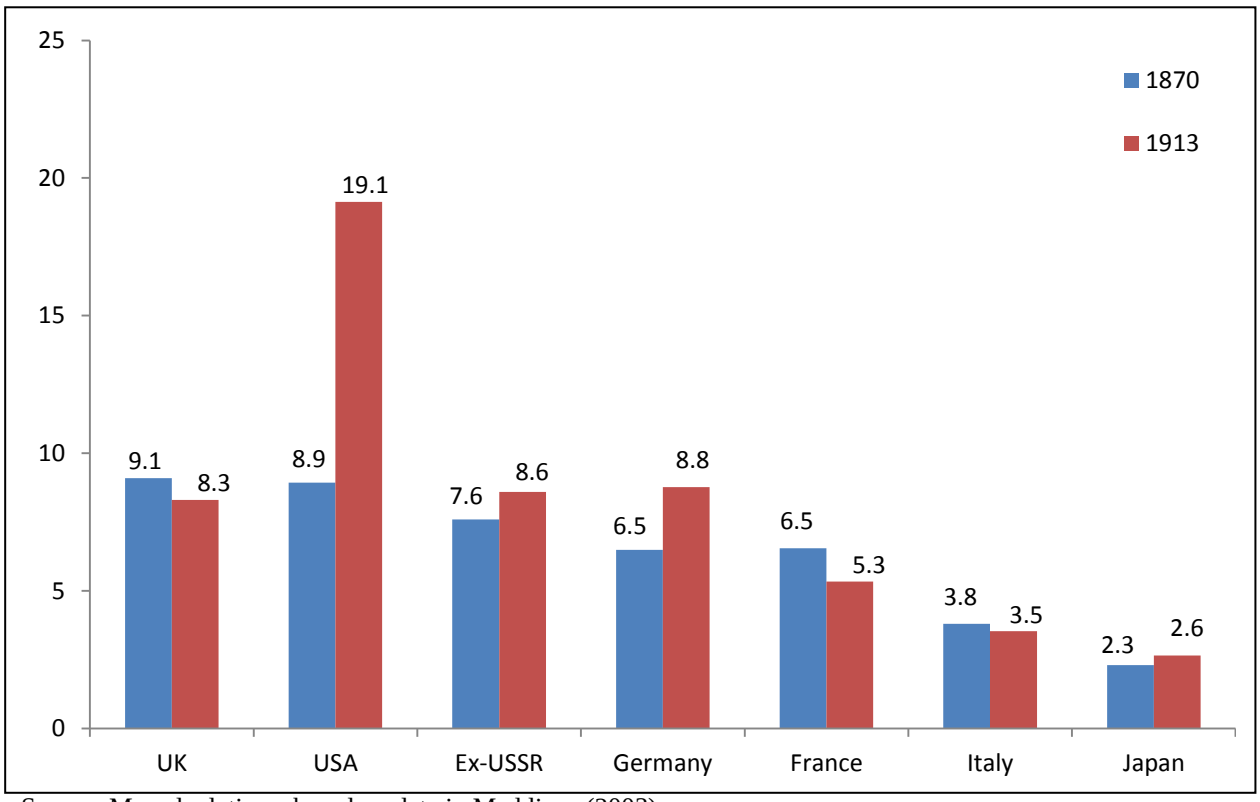


Source: Maddison (2003).

The overall economic shift is further elucidated in figures 32d and 32e. These charts quantify the change in each power's share of global GDP between 1870 and 1913. The intuitions contained in the dollar figures previously are plain to see here. The United Kingdom's share of global output fell by 8.7 percent over the 43 years, while France's fell even further, by 18.4 percent. Russia's, by contrast, increased by 13.1 percent, Japan's by 14.9 percent, Germany's by an impressive 35.3 percent, and the United States' by a whopping 114.2 percent. In short, the available data from 1870-1913 makes clear that a major shift in the balance of economic output took place during this period; all boats rose, but some

rose much further and faster than others – an outcome entirely consistent with the integration-convergence theory presented in this dissertation.

Figure 32d. Major Powers' Share of Global GDP, %



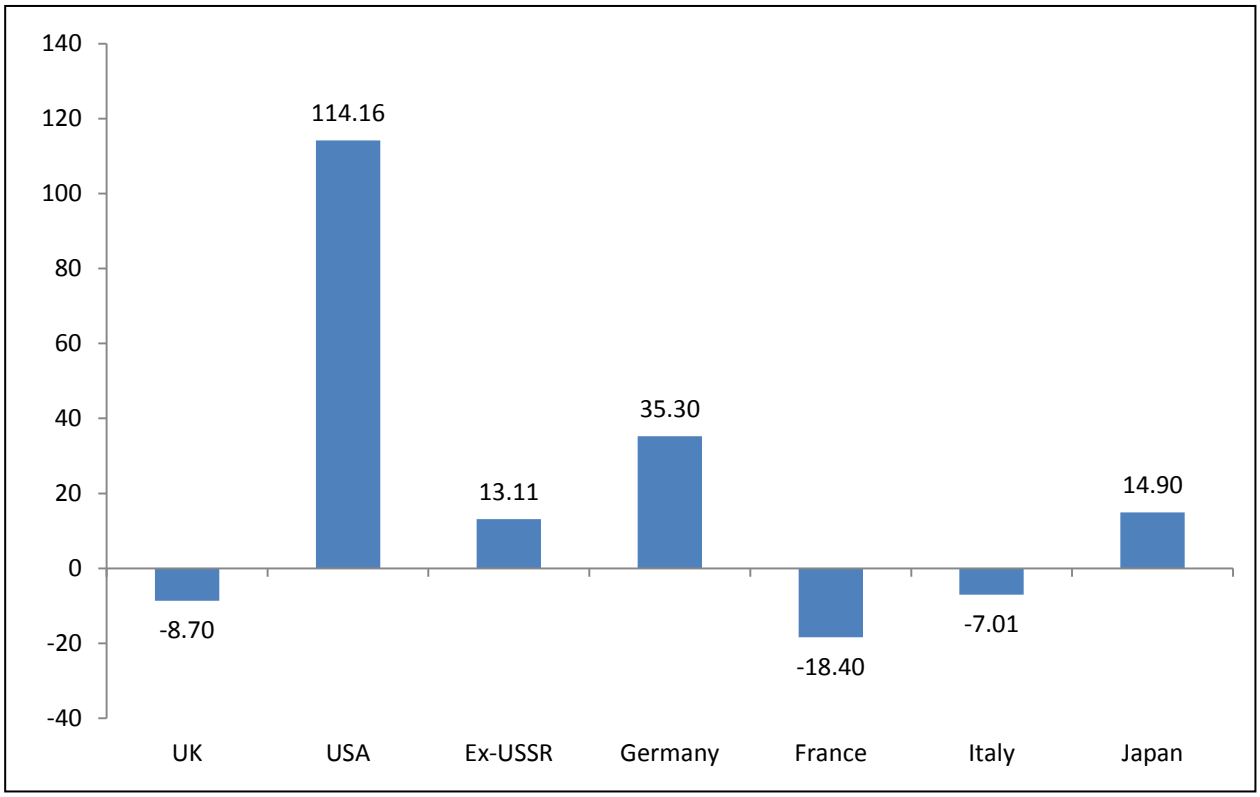
Source: My calculations, based on data in Maddison (2003).

Specific Shifts in Industrial Wherewithal, 1870-1913

What specific shifts in industrial wherewithal underlie the aggregate national output data presented above? The answers to this question are important on two levels. First, by looking at specific industrial shifts, it is possible to see whether the mechanisms outlined previously (goods trade, financial flows, and technology diffusion) actually contributed to the observed catch-up growth, thereby contributing to process-tracing. Second, insofar as particular types of industrial capacity contributed to states' war-making capabilities when war threatened at the end of the period, understanding the specifics of the industrial balance contribute to an overall understanding of the balance of power. Accordingly, this section

briefly presents some relevant data on specific industrial shifts that occurred between 1870 and 1914.

Figure 32e. Major Powers' Change in Share of Global GDP, 1870-1913, %



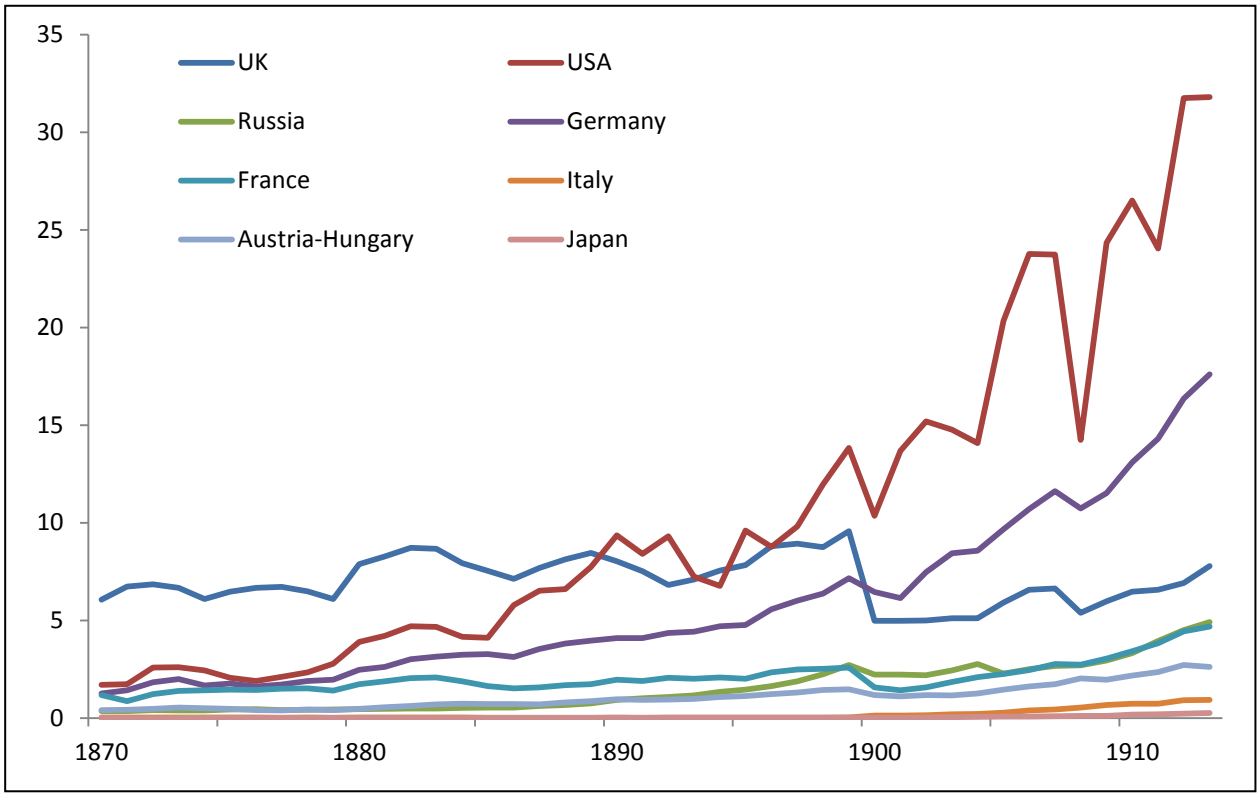
Source: My calculations, based on data in Maddison (2003).

Looking first at the global level, figures 33a and 33b present industrial capacity data for all eight of the world's then-major powers.[87] The first of these two charts – showing the major powers' annual iron and steel output – is particularly telling from an industrial wherewithal perspective, particularly in the context of the earlier discussion on the diffusion of the Bessemer converter and the Gilchrist-Thomas process. As the chart makes clear, the United Kingdom was the world's principal iron and steel manufacturer by several orders of magnitude in 1870, and retained its world lead until the 1890s and its European lead until the

[87] Correlates of War National Material Capabilities Dataset, Version 4.0; accessed online on 15 February 2011 at http://www.correlatesofwar.org/COW2%20Data/Capabilities/NMC_v4_0.csv. For academic citation on the database's development: (Singer, May 1988; Singer, Bremer, & Stuckey, 1972)

start of the twentieth century. Yet by 1913, UK production had been comprehensively outstripped by both Germany and the United States. Just as significantly from a European balance perspective, France had gone from being 'third amongst equals' in 1870 – that is, close to UK and German output levels – to producing barely a quarter of the German total and a similar amount to Russia (which had come from a virtually non-existent base in 1870) by 1913.

Figure 33a. Major Powers' Annual Iron and Steel Output, million tons

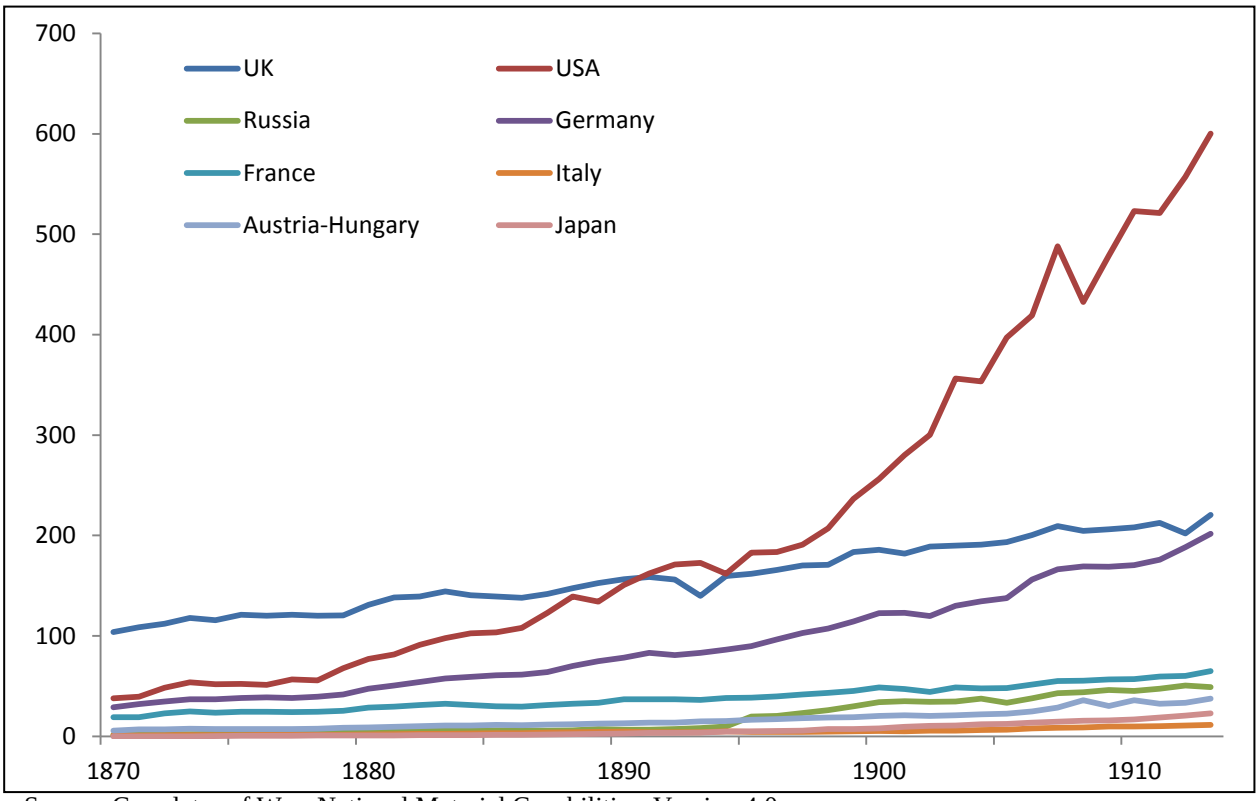


Source: Correlates of War: National Material Capabilities, Version 4.0.

A similar pattern is reflected in figure 33b, which measures each of the major powers' energy usage (defined in coal-ton equivalents). Here, the United Kingdom is only overhauled altogether by the United States, again in the 1890s, reflecting the fact that UK industry remained more dominant within Europe in energy-intensive sectors other than bulk metal manufacturing and that Britons enjoyed favourable levels of domestic energy consumption.

Nonetheless, Germany again goes from being dwarfed by UK energy usage in 1870 to practically the same level in 1913, and France again goes from third within a three-state European top-tier at the start of the period to barely a third of the German level 43 years later.

Figure 33b. Major Powers' Primary Energy Consumption, million coal-ton equivalents



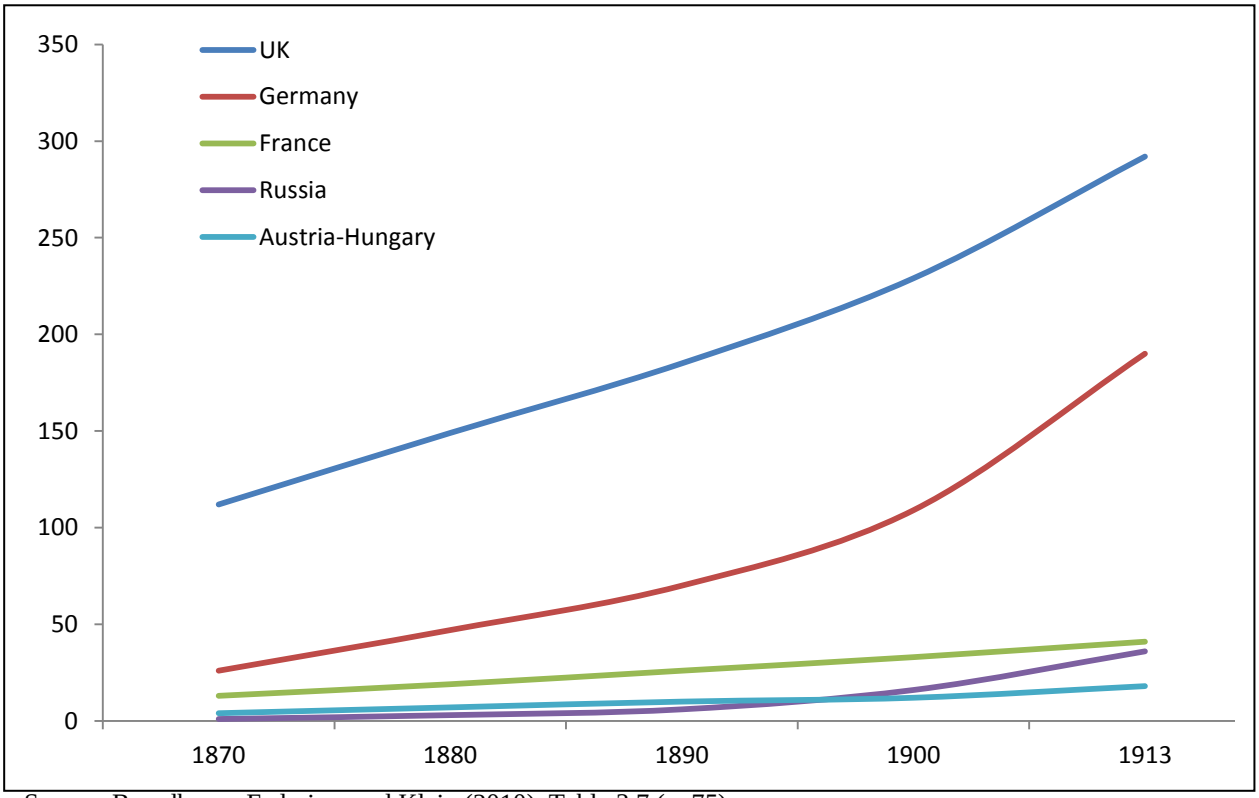
Source: Correlates of War: National Material Capabilities, Version 4.0.

Turning away from such scarce global-level data to some greater intra-European detail, figures 34a to 34d provide data on production and consumption of four key industrial products for the European major powers.[88] First, figure 34a shows that throughout the 1870-1913 period, the United Kingdom remained Europe's principal fossil fuel producer – clearly a result that owes at least as much to natural resource endowments as to national development levels. That said, industrial demand plays a role in the rate at which a state's natural resources are extracted – and the spike in German coal production to the point where it represented

[88] (Broadberry et al., 2010, p. 75) UK, German and French figures are included for all four products; the less industrialised European major powers are only included where there is adequate data.

around two-thirds of UK output and more than four times French output is therefore consistent with the broader pattern painted above.

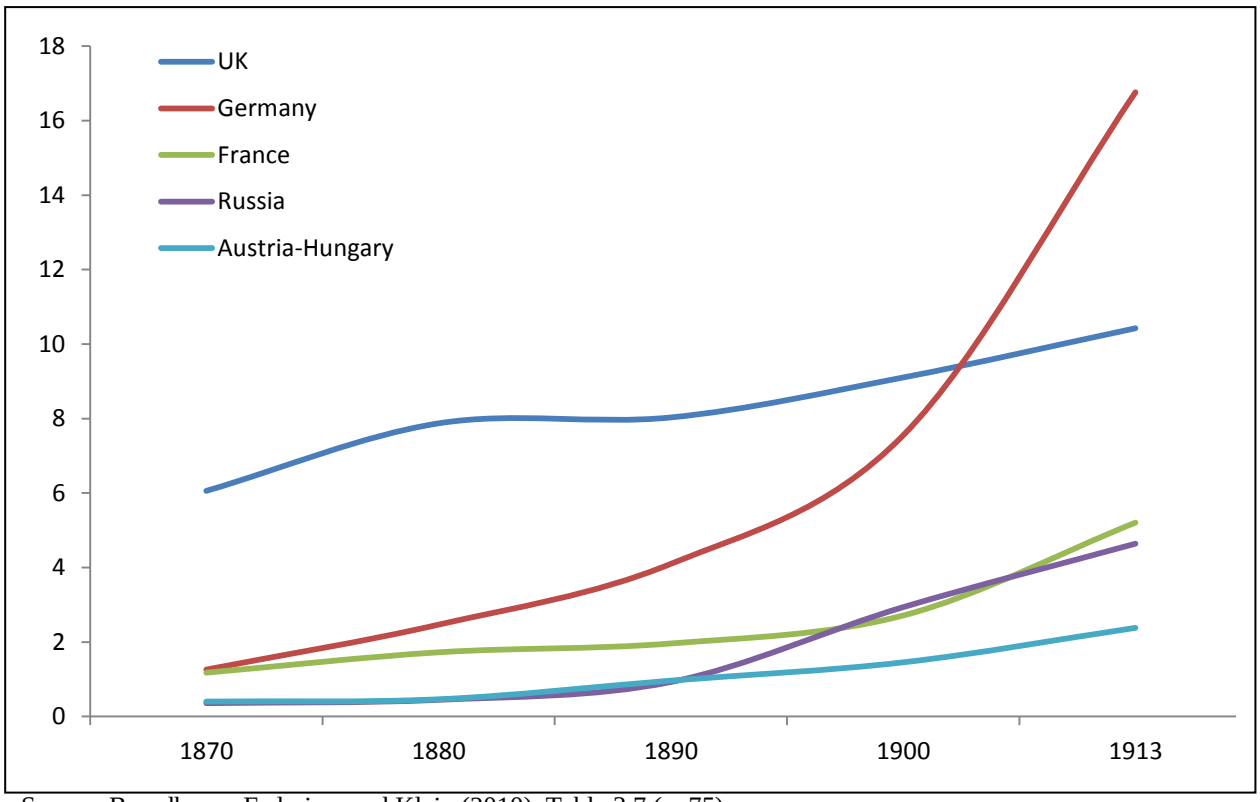
Figure 34a. European Powers' Annual Coal Production, million tonnes



Source: Broadberry, Federico, and Klein (2010), Table 3.7 (p. 75).

Second, figure 34b builds on the aggregate iron and steel data presented earlier, by providing specifics on five European powers' pig iron production over the 1870-1913 period. Again, we see that German iron production – practically equal to French production in 1870 – was nearly three times the size of French output (and nearly half as big again compared to UK output) by 1913. Notably, Russia also went from an output level comparable to Austria-Hungary's low figure in 1870 to approximately double Austro-Hungarian output in 1913 once Russian industrialisation was underway – a statistic that is significant when the dynamic between these two powers in the run-up to World War I is considered.

Figure 34b. European Powers' Annual Pig Iron Production, million tonnes



Source: Broadberry, Federico, and Klein (2010), Table 3.7 (p. 75).

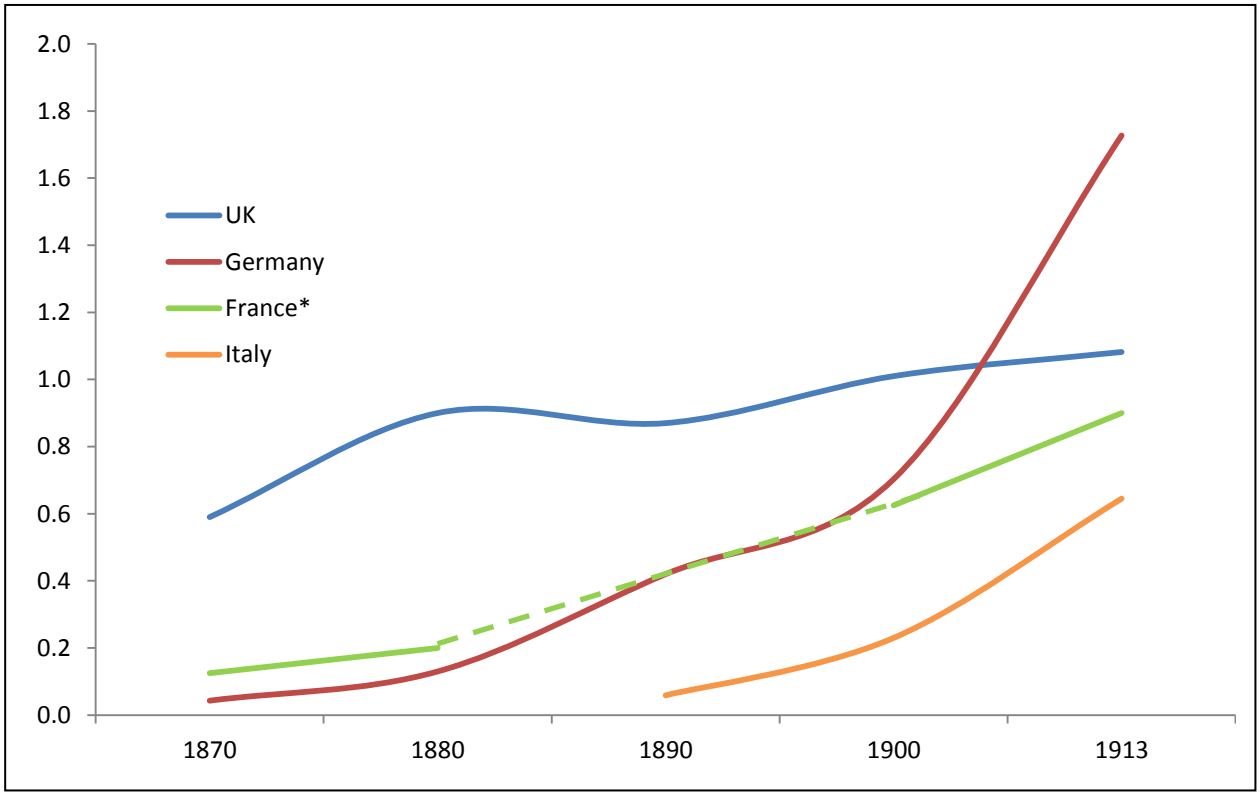
Third, figure 34c provides data on the balance of the nineteenth century European industrial chemicals industry. Reflecting the earlier discussion of Germany's comparative strength in the chemical sector, the UK's 1870 lead in the production of sulphuric acid – a key bulk chemical input in a number of industries, including iron- and steel-making – was wiped-out around 1900.[89] France and Italy actually also displayed impressive output growth, converging towards the UK output level, but their gains were not on the same scale as those of Germany.

Finally, figure 34d provides data on consumption of raw cotton – the principal input for textile manufacturing – by all six of the European major powers. It is here that the United Kingdom most comprehensively retained its lead, reflecting its comparative advantage as a world exporter of milled fabrics. Germany again displayed a widening lead over France, although the difference was not as great as in heavier industries. Russia also displayed a

[89] On Germany's strength in the chemicals sector, see (Mokyr, 1999, pp. 4-5)

notable uptick in cotton consumption, coming close to German usage levels from 1900 onwards, reflecting the beginnings of industrialisation seen in Russia from the 1890s.

Figure 34c. European Powers' Annual Sulphuric Acid Production, million tonnes



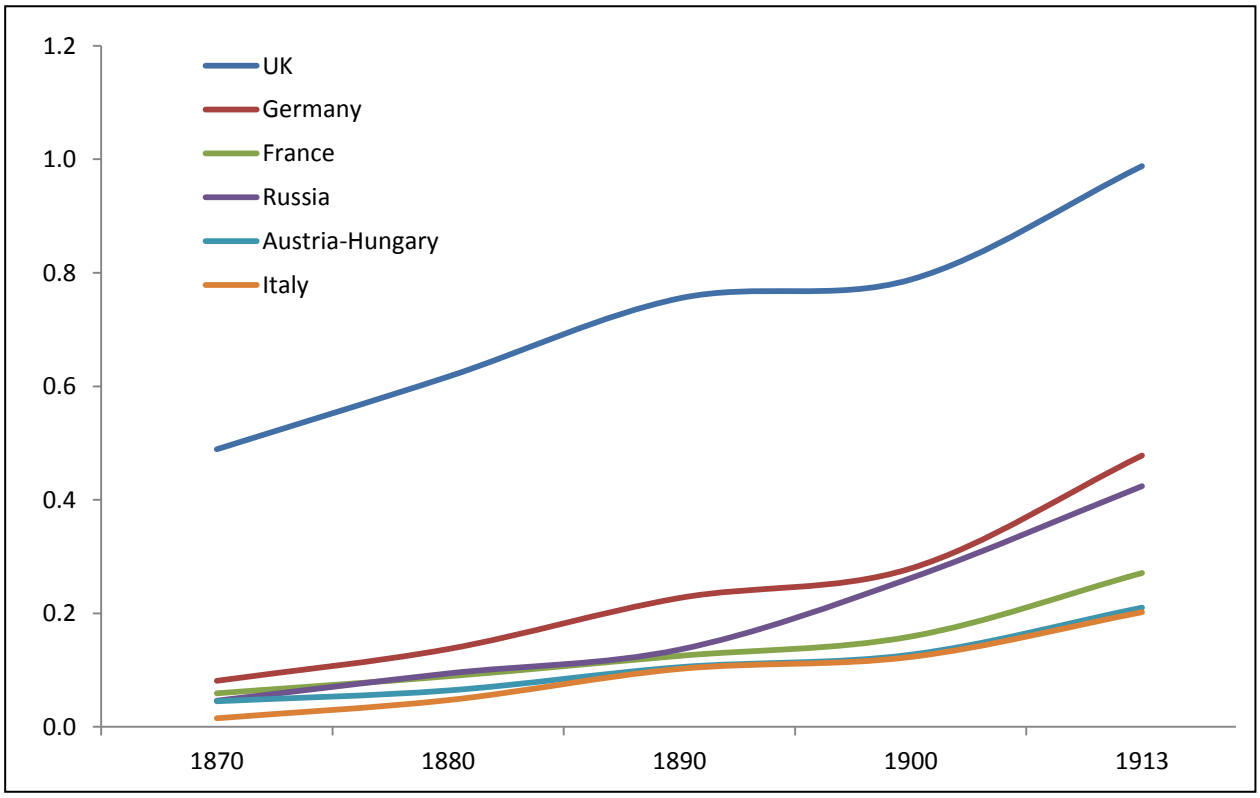
Source: Broadberry, Federico, and Klein (2010), Table 3.7 (p. 75). *No French data available for 1890, hence linear interpolation.

The Strategic and Geopolitical Impact of Economic Power Shifts, 1870-1914

The previous sections of this chapter provide ample evidence that substantial economic integration of goods, financial, and skills markets took place between 1870 and 1914, and that this integration enabled follower economies to converge on the output levels of the UK economy. Insofar as these follower economies had large populations, an increase in their per capita GDP shifted the overall balance of world economic output; while all of the major powers' economies grew over the 44 years, some grew significantly more than others, such that the distribution of production between the major powers in 1914 represented a marked change from 1870. The practical result of this differential growth was that the United

States emerged as by far the world's largest economy, while the most crucial dynamic from a European perspective was that Germany both overtook the United Kingdom – Europe's offshore balancer over the previous century – in total national economic output and went from a position of near-parity with France to more than double the economic wherewithal of its western neighbour. Other salient dynamics were the industrial growth of Russia, the rapid development of Japan from its feudal past into a nascent industrial economy, and the ongoing relative decline of the comparatively un-dynamic Austro-Hungarian Empire.

Figure 34d. European Powers' Annual Raw Cotton Consumption, million tonnes



Source: Broadberry, Federico, and Klein (2010), Table 3.7 (p. 75).

With these economic dynamics documented, I now turn to consider how they impacted the balance of power; that it, how economic shifts manifested themselves as shifts in the military-strategic balance. The section begins by considering the evolution of the global balance of power. It then discusses how economic shifts impacted on the strategic balance in Northeast Asia, which in turn contributed to the outbreak of the Russo-Japanese

War. Finally, it considers how economic shifts drove changes in the European military balance, which in turn contributed to the outbreak of World War I.

The Global Balance of Power, 1870-1914

How did the strategic standing of the world's eight major powers change in the 44 years following 1870? Figure 35 provides a sense of the overall dynamic, by charting the Correlates of War (CoW) programme's composite index of national capability for the United Kingdom, United States, Germany, France, Russia, Japan, Italy, and Austria-Hungary.[90] The CoW composite index combines population data (both total and urbanised), industrialisation metrics (bulk metal output and energy usage), and military power data (military personnel numbers and total defence spending).

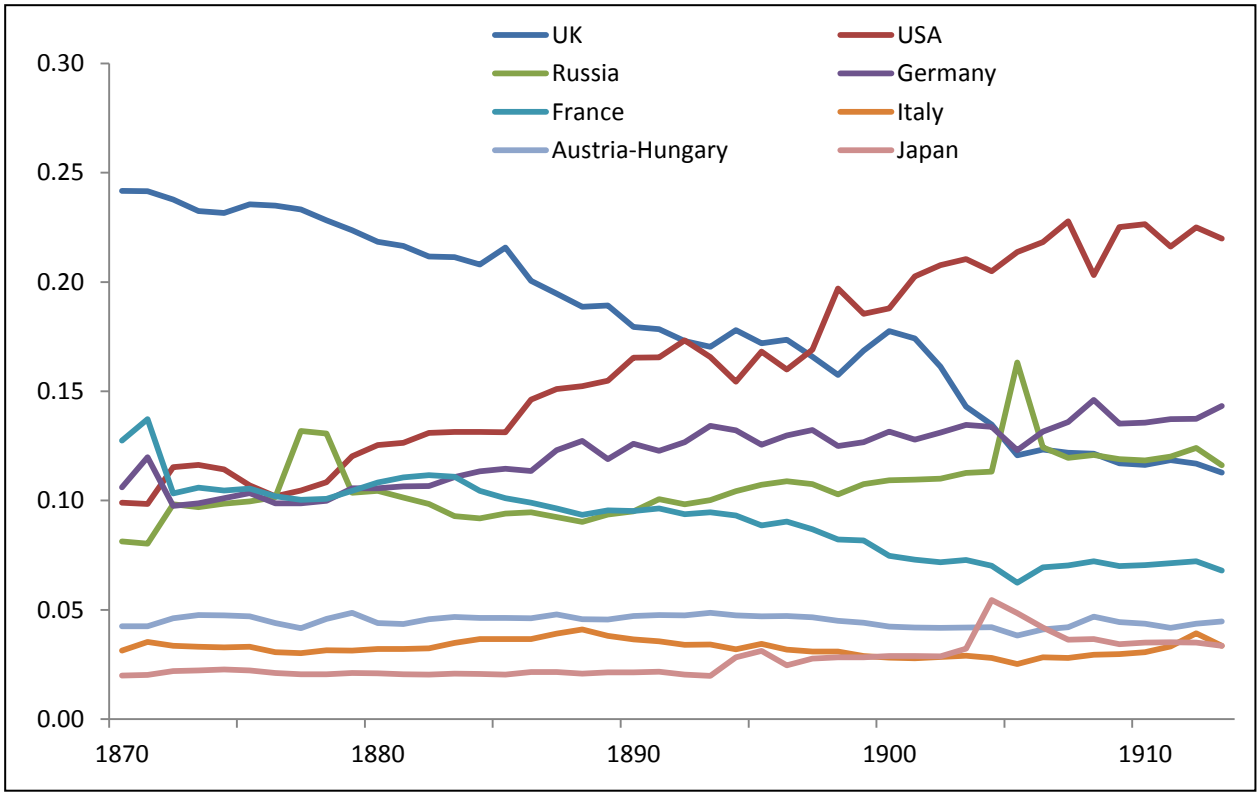
The chart bears out the story told throughout this chapter and the wider dissertation. The United Kingdom was replaced as the world's foremost great power by the United States in the late 1890s, while Germany emerged as Europe's most capable power around the middle of the first decade of the twentieth century. Russia also became an increasingly capable state – it was on an upwards trajectory, though not as capable as Germany – while France ceased to be a major power peer with viable prospects for independently balancing Germany. Austria-Hungary and Italy essentially flat-lined at the bottom of the major power club, while Japan posted noteworthy gains but suffered from its negligible starting position.

The CoW Index is clearly an imperfect proxy for precise military-strategic wherewithal. Total population does not contribute to military power if it cannot be effectively organised, taxed and armed, for instance, while the fact that the United Kingdom, United States and Japan are separated from their principal strategic threats by large moats obviously

[90] Correlates of War National Material Capabilities Dataset, Version 4.0; accessed online on 15 February 2011 at http://www.correlatesofwar.org/COW2%20Data/Capabilities/NMC_v4_0.csv. For guidance on the composition and reliability of the Index, see the accompanying Version 4.0 Codebook, accessed on 15 February 2011 at http://www.correlatesofwar.org/COW2%20Data/Capabilities/NMC_Codebook_v4_0.pdf. See also: (Singer, May 1988; Singer et al., 1972)

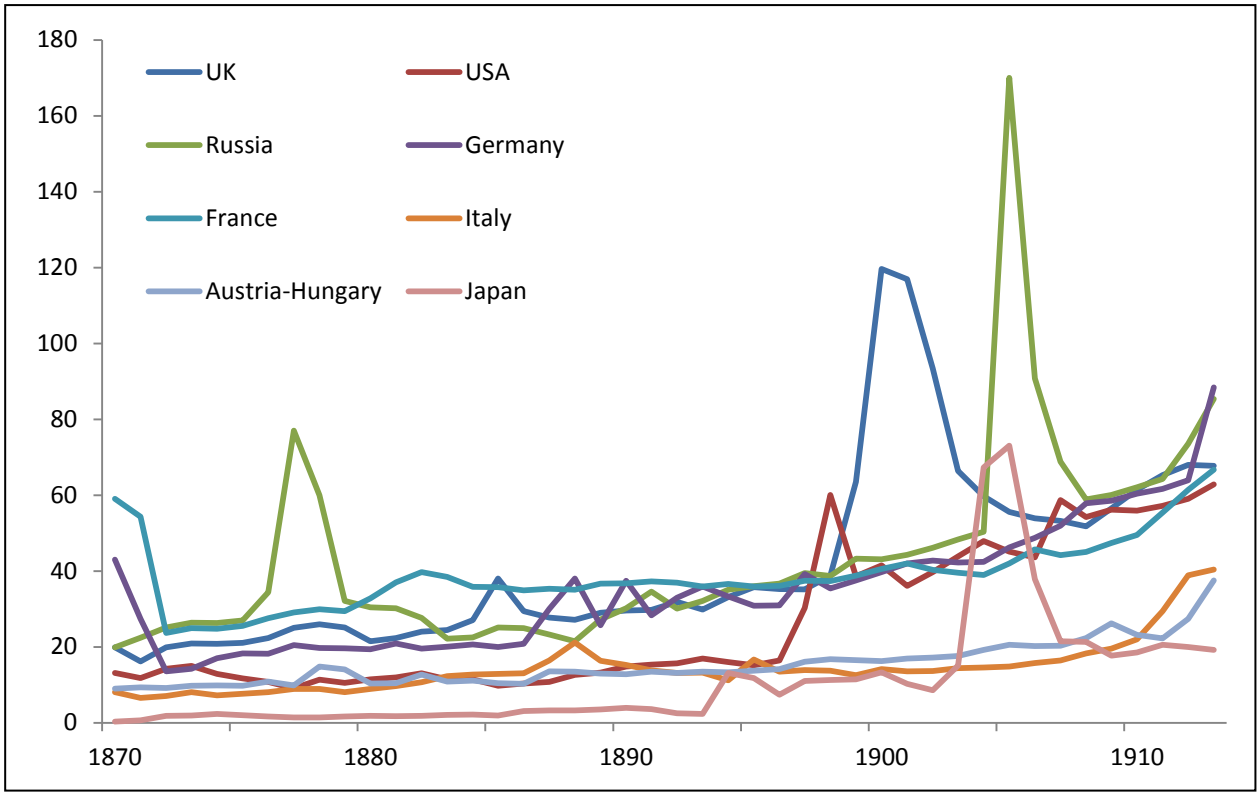
reduced the requirement for large armies (whose effectiveness is itself determined by leadership, training and equipment). Moreover, several of the variables that contribute to the CoW index can be considered causal at the underlying military-industrial level (for example, iron and steel output) – and have therefore already been considered in their own right earlier in this chapter – while others can be considered as dependent variables in themselves (for instance, military spending). Nonetheless, it provides at least a first overview of the eight powers' relative standing that incorporates both their actual military outputs (budgets and personnel) and their underlying industrial potential to generate additional military power when required.

Figure 35. CoW Composite Index of National Capability



Source: Correlates of War: National Material Capabilities, Version 4.0. *The CoW Composite Capabilities Index is an aggregate national power metric composed of Total Population, Urban Population, Iron and Steel Production, Primary Energy Consumption, Military Expenditure, and Military Personnel numbers.

Figure 36. Major Powers' Defence Spending, then-year GB£ million



Source: Correlates of War: National Material Capabilities, Version 4.0.

Moving on from the composite index, figure 36 extracts CoW data for the single most important determinant of aggregate military strength – total military spending – and plots its evolution in pound sterling terms from the start of the first globalization wave to the eve of World War I.[91] As noted at the outset, the dissertation operates with an understanding that the feed-through between economic power and military output will be imperfect, skewed in the short term by domestic and foreign political pressures, and that the factor that is most important for the overall causal story is thus the relative capability of states' underlying *economic* base, which is the source of their *long-term* military potential. Nonetheless, looking at defence spending – and derivative metrics, such as military capital intensity

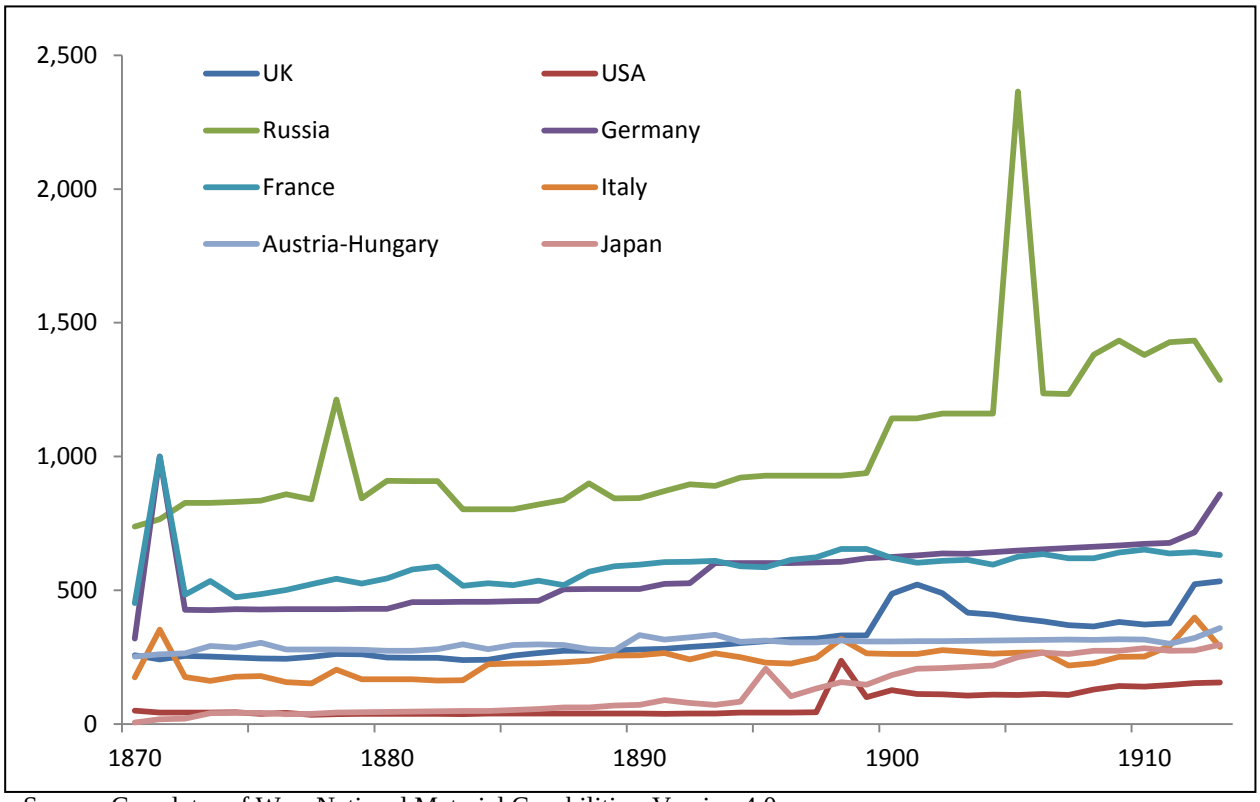
[91] Correlates of War National Material Capabilities Dataset, Version 4.0; accessed online on 15 February 2011 at http://www.correlatesofwar.org/COW2%20Data/Capabilities/NMC_v4_0.csv. See also: (Singer, May 1988; Singer et al., 1972)

(spending/personnel) – still provides a valuable insight into how economic potential gets manifested as military means, particularly when viewed over a long-term period.

The 1870-71 Franco-Prussian War that resulted in German unification is clearly visible at the start of the period in French and German spending data, as are Russia's exertions in the 1877-78 Russo-Ottoman War, US funding of the 1898 Spanish-American War, UK efforts in the 1899-1902 Second Boer War, and Russian and Japanese efforts in their 1904-5 confrontation. Beyond these temporary spikes, however – all of which were in any case dwarfed as full-scale national mobilisation took place from 1914 onwards – the key underlying pattern correlates with the broader economic shifts seen over the period. France started the period as the world's largest defence spender, and spent the majority of the period until the mid-1890s in that position, and while Germany spent the majority of the period in the front rank of military spenders, no one of the three principal continental European powers (France, Russia or Germany) looked likely to open-up a sustained lead over either of the other two prior to 1905.[92] Moreover, as the United Kingdom demonstrated in 1899, British industrial potential was such that it returned considerable 'surge' capacity when a threat overseas required a ground commitment. Yet in the last decade of the period, France started to fall visibly behind Russia and Germany, disrupting the continental European balance, with the latter finally emerging as the world's foremost defence spender in 1913. Accordingly, it seems that the economic shifts documented previously were indeed borne-out in military spending levels, albeit imperfectly (insofar as shocks that placed demand-side pull on defence spending were at least as important as the supply-side national resource base).

[92] The obvious caveat to this is that while Russian military spending soared during the Russo-Ottoman and Russo-Japanese Wars, this spending was (a) unsustainable, and importantly from the perspective of great power stability in Europe, (b) directed at a major power outside the region (and therefore not an immediate threat to the other two).

Figure 37. Major Powers' Military Personnel, thousands



Source: Correlates of War: National Material Capabilities, Version 4.0.

Figure 37 provides data on a different metric of military strength: total armed forces personnel numbers.[93] Clearly, overall personnel numbers have less to do with national wealth and more to do with overall population size than military spending does, particularly when conscription is in place. Moreover, as noted above, insular powers – that is, major powers that do not share their landmass with any other major powers, such as the United Kingdom, United States, and Japan – do not necessarily need mass armies unless they intend to engage in a continental commitment; for such powers, navies – which require relatively low levels of manpower – are more important. That said, the ability to draft, arm, train, feed, pay, lead, and organise mass armies itself requires substantial expenditure. The data is therefore presented

[93] Correlates of War National Material Capabilities Dataset, Version 4.0; accessed online on 15 February 2011 at http://www.correlatesofwar.org/COW2%20Data/Capabilities/NMC_v4_0.csv. See also: (Singer, May 1988; Singer et al., 1972)

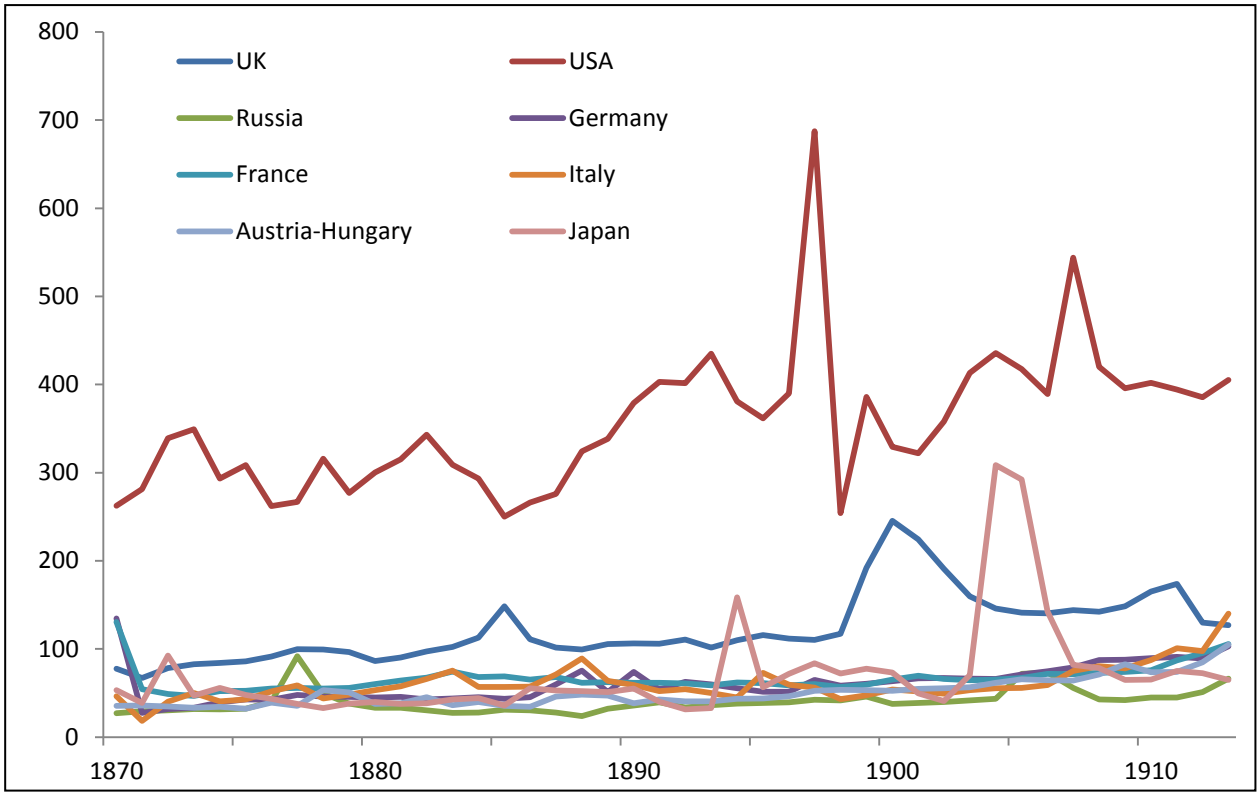
here, both because it is significant in its own right, and because the data in figure 36 and 37 together combines to generate the metric of military capital intensity presented in figure 38.

As would be expected, Russia – a continental power with a large peasant population – possessed the largest army throughout the 43-year period, with 1.29 million men under arms as of 1913. Britain's was relatively small (533,000 in 1913), at a size comparable to those of major-power weaklings Austria-Hungary and Italy, while US forces were tiny (155,000 in 1913). The only dynamic of much interest is the position switch seen between France and Germany: while the former had the larger army until the late 1890s, by 1913, the latter had a lead of 227,000 troops (at 859,000 personnel) over its western neighbour's 632,000.

A more interesting metric of military capability for my purposes, insofar as it is directly tied to economic development and has more direct implications for levels of battlefield proficiency, is the capital-intensity of the armed forces. This is proxied in figure 38 by dividing total defence spending by total military personnel numbers, in order to reveal the amount of money spent on the military per soldier/sailor/airman.[94] Such a figure gives some sense of the amount spent on equipping, training, and providing for the welfare of each individual member of the armed forces, and therefore serves as an indicator of the likely level of fighting power generated per serviceman. Warship-heavy force structures – that is, countries that give a strong role to their navy relative to their ground force – are naturally reflected as high military capital intensity, since building a warship to put 500 sailors in and training them to operate it costs considerably more than giving 500 conscripts a rifle. But more advanced ground forces also display higher military capital intensity, since well-trained professional soldiers – who earn a decent wage and are well-supplied with vehicles, artillery, aircraft, and so forth – are considerably more costly per man than an army of untrained, minimally equipped, badly led conscripts.

[94] Correlates of War National Material Capabilities Dataset, Version 4.0; accessed online on 15 February 2011 at http://www.correlatesofwar.org/COW2%20Data/Capabilities/NMC_v4_0.csv. See also: (Singer, May 1988; Singer et al., 1972)

Figure 38. Major Powers' Military Capital Intensity, GB£ spent per troop

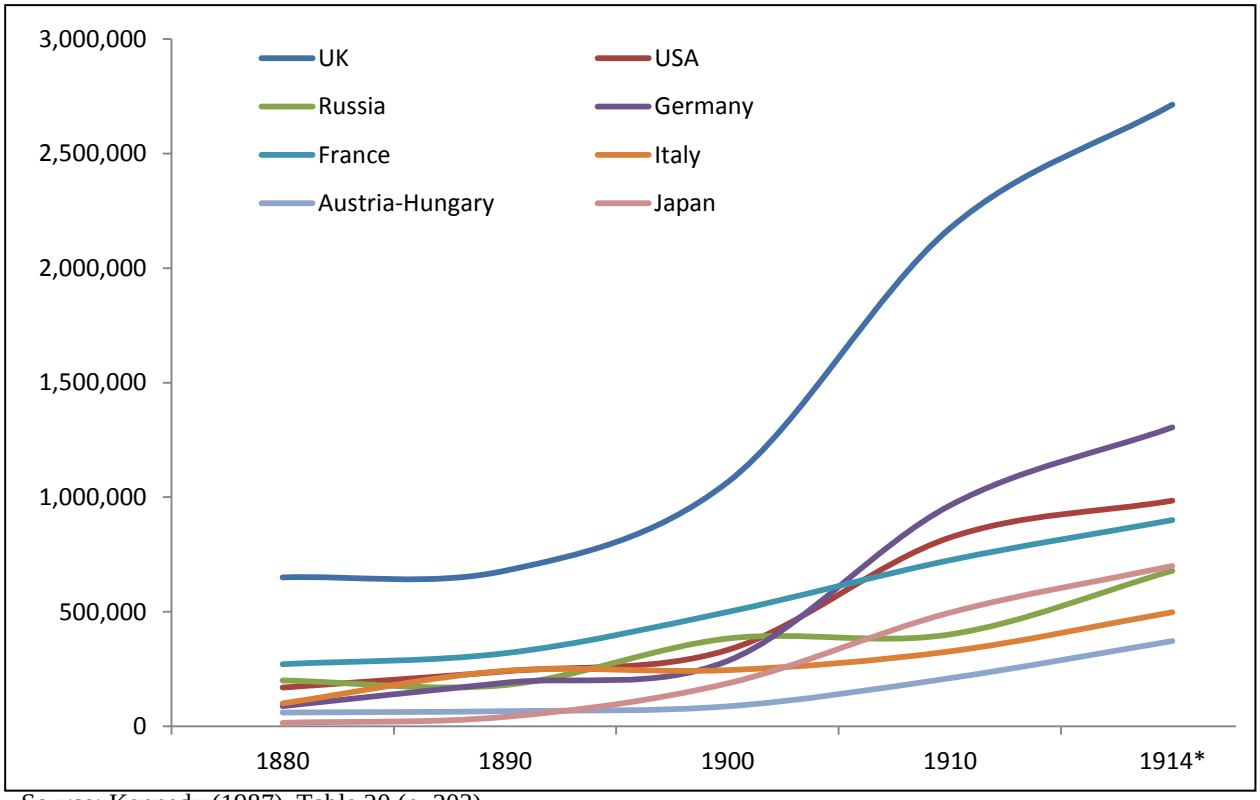


Source: My calculations, based on data in Correlates of War: National Material Capabilities, Version 4.0.

The data on this front is again telling. The United States – with its small but well-funded and professional armed forces – possessed by far the highest level of military capital intensity throughout the 1870-1913 period. The United Kingdom, with its relatively small-but-professional imperial army and overwhelming focus on naval strength, possessed the next most capital-intensive military for most of the period, but its lead was eroded after 1910 by improvements in the equipment and professionalism of the German, French, Austro-Hungarian and Italian armies. The Russian armed forces suffered from the lowest spending per soldier of any major power for most of the period, as is to be expected of a mass army of poorly equipped and catered-for conscript peasants. Japanese military capital intensity was similar to that of the continental European powers for much of the period, with a couple of major upticks, which again fits with its 'UK-like' naval and imperial orientation. Insofar as military capital intensity is connected to national economic development, therefore, it would

seem that there is again a fit between the catch-up growth of 1870-1914 and the level of technical and professional sophistication of the different powers' armed forces. That said, this finding must again incorporate a major caveat; namely, that continental powers enjoying a large population endowment may choose to field a large mass army, with the result that their military capital intensity looks low without necessarily being a metric for 'weakness.'

Figure 39. Major Powers' Warship Tonnage, 1880-1914



Source: Kennedy (1987), Table 20 (p. 203).

Following from the discussion above about particular variations of military force posture, figure 39 presents data on the evolution of the major powers' naval fleets by tonnage over the 1880-1914 period.[95] The most obvious trend is that the United Kingdom not only preserved its lead over the next-most capable naval power, but actually widened it in tonnage terms. As such, it seems at first glance that maritime strength may have been one sphere

[95] (Kennedy, 1987, p. 203) All calculations in this paragraph are my own, based on data in this table.

where shifting economic balances were not manifested in a notable change in the balance of military power.

However, despite preserving its lead over any individual rival fleet, the Royal Navy's tonnage as a proportion of the combined tonnage of the next seven most capable fleets declined from 72.0 percent to 49.9 percent over the 34-year window. The Imperial German Navy, in particular, increased its fleet size from a negligible 13.5 percent of the Royal Navy total in 1880 to roughly half (48.1 percent) by 1914. Such an achievement was of considerable significance for the conduct of World War I: because Germany successfully pursued a maritime strategy of 'fleet-in-being,' avoiding the destruction of its big-enough-to-be-dangerous High Seas Fleet by the Royal Navy, the British Grand Fleet had to spend practically the entire conflict concentrated in the North Sea, lest the Germans break out when UK coastal waters were undefended.[96] Consequently, UK naval supremacy could not be brought fully to bear in other theatres of the war, substantially mitigating the United Kingdom's single largest area of military dominance.

Accordingly, the observed changes in naval strength between 1880 and 1914 actually constituted a much more significant shift in the overall balance of power than the headline numbers would seem to suggest. And insofar as follower powers' naval catch-up was facilitated by their economic catch-up growth, these dynamics fit with the overall theory. Other notable naval risers were the United States, which possessed the third-largest navy by 1914, and Japan, which came from a base of essentially no naval power in 1880 to possess the world's fifth-largest battle fleet by 1914.[97] As in practically every other sphere, France went from being the second-greatest naval power in 1880 to fourth-greatest in 1914, having been overhauled by Germany and the United States. Russia fell into sixth place, behind

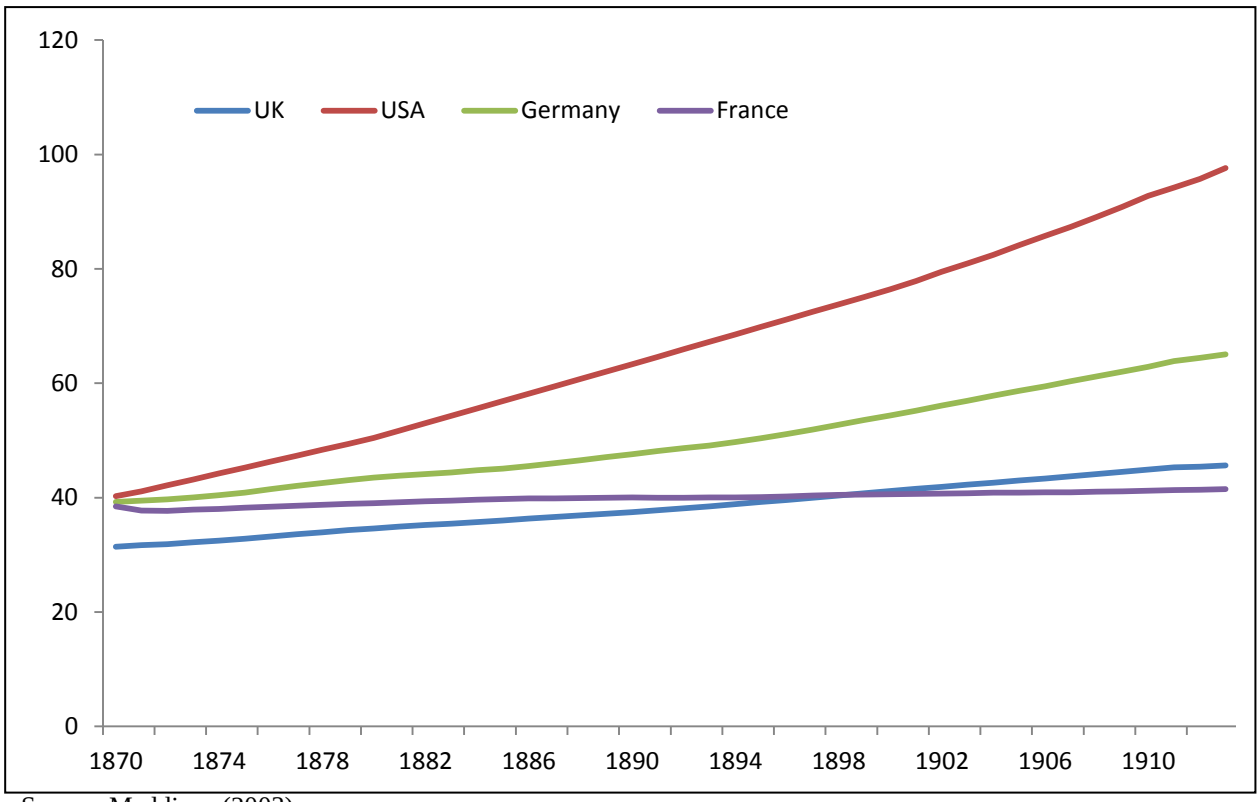
[96] (Defence, 2004, pp. 43-44)
[97] Incidentally, this is another important case for the technology-sharing mechanism discussed earlier, insofar as most of the early Imperial Japanese Navy's capital ships were imported from the United Kingdom, while many of their most capable guns were made by Germany's Krupp: (Kennedy, 1987, p. 209)

Japan, following its losses in the 1904-5 War. Some scholars have contended that naval strength is not of great significance to the overall balance of power, because it cannot be used to existentially threaten other great powers.[98] But this neglects the fact that for insular powers – the United Kingdom, United States, and Japan – maritime power is the underlying backstop of national security, since their territory cannot be threatened unless they suffer naval defeat, and insofar as those powers were of systemic importance, the naval balance must correspondingly be considered of consequence to the overall balance.[99]

A final dynamic of significance to the global balance of power – from both an industrial and a military-manpower perspective – was differential population growth, with data for four key major powers being presented in figure 40a and 40b.[100] Clearly, this is only partially a product of integration, insofar as domestic birth rates play a key role. However, insofar as the migration flows documented earlier changed overall populations, while economic development – which was itself largely driven by integration in this period – ensured that GDP per capita kept rising even as populations grew, it is still worth considering here. France's demise as a roughly equal bulwark against Germany by the early twentieth century, the United Kingdom's demise as a sufficiently superior offshore balancer to be able to enforce order in Europe by the same timeframe, and the United States' rise as a vast continent was opened, populated, and industrialised are all visible. These three follower powers – all of which had practically identical populations in 1870, and all of which were larger than the United Kingdom at that time – followed strikingly different population growth patterns during the 43-year period. Germany's 1871 unification and industrialisation-fuelled population boom contributed to its rise, while the United States experienced the latter effect as well as massive inflows of immigrants. This again fits with the overarching pattern.

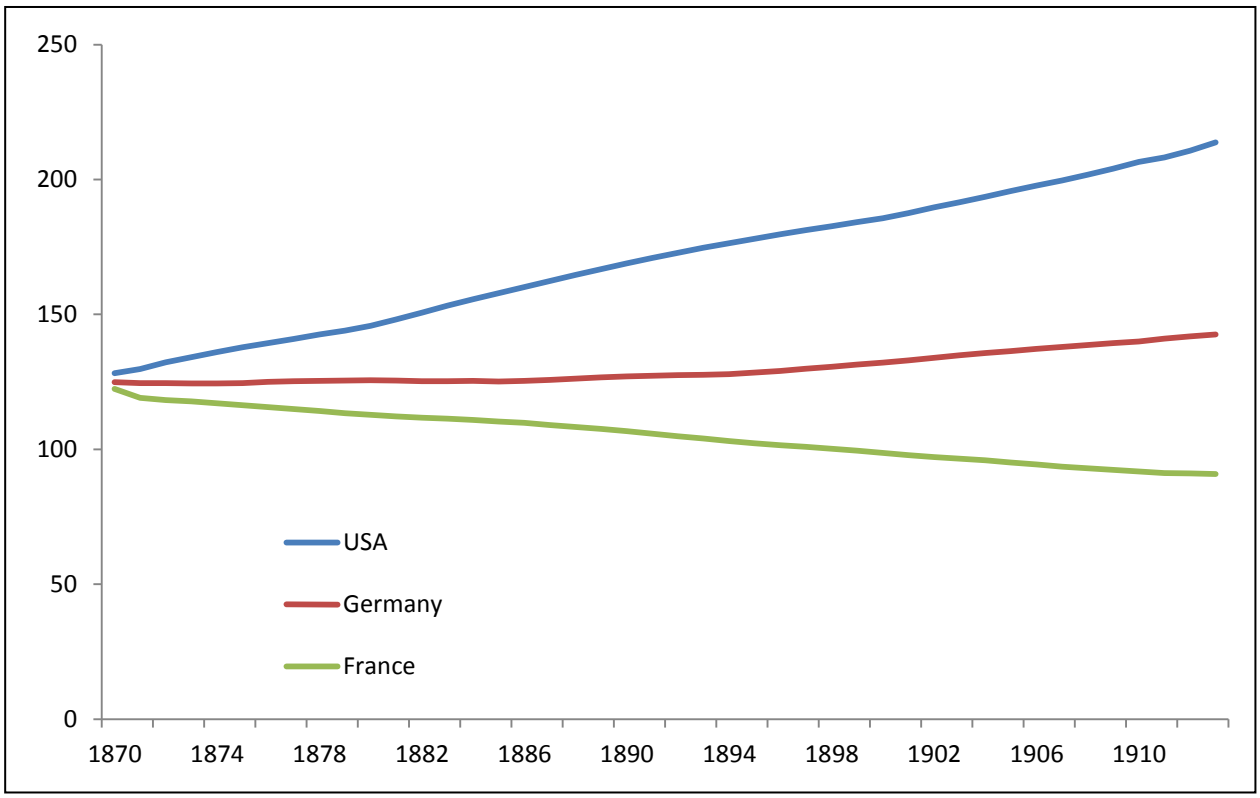
[98] (Mearsheimer, 2001, pp. 83-137)
[99] (Blagden et al., Fall 2011)
[100] (Maddison, 2003b)

Figure 40a. Selected Major Powers' Populations, million



Source: Maddison (2003).

Figure 40b. Selected Major Powers' Population, % of UK population



Source: My calculations, based on data in Maddison (2003).

Economic Power Shifts, the Military-Strategic Balance, and Imperial Encroachment in Northeast Asia, 1903-05

On 8 February 1904, Japan declared war on Russia, and launched an assault on the Russian fleet then moored at Port Arthur in Manchuria. The Russians had sought the use of the Port Arthur (present-day Lüshunkou) in the late nineteenth century, so as to possess a Pacific naval base that did not freeze in winter (as Vladivostok did), and signed a lease for its usage with China in 1898. Russia then began the construction of a railway from its Asian border to the coast, in order to consolidate its position at Port Arthur. Japan became increasingly concerned by the threat of Russian imperial encroachment into Korea, a region that Japan considered vital to national security due to its proximity, especially after St Petersburg had made no move to evacuate its 170,000-plus-strong force that it had sent to assist with the suppression of the Boxer Rebellion as of 1903. Tokyo initially sought a negotiated settlement, in which Japan would acknowledge Russian imperial domination of Manchuria in exchange for St Petersburg doing the same with regard to Japanese control of Korea, as fighting Russia was perceived to be risky. However, when the last diplomatic proposal had met with no Russian response as of early February 1904, the Japanese severed diplomatic ties with St Petersburg and prepared for war. The Russo-Japanese War was formally concluded with the Treaty of Portsmouth on 5 September 1905, where – after a succession of severe Russian naval and land defeats – St Petersburg agreed to acknowledge a Japanese sphere of influence over Korea and withdraw all troops from Manchuria.[101]

The previous paragraph clearly contains only a brief sketch of the events leading up to the war – but fortunately, a more detailed exploration of the diplomatic backdrop and military campaign is beyond the requirements of this dissertation. The key point, rather, lies in the

[101] This overview is drawn from (Nish, 1985)

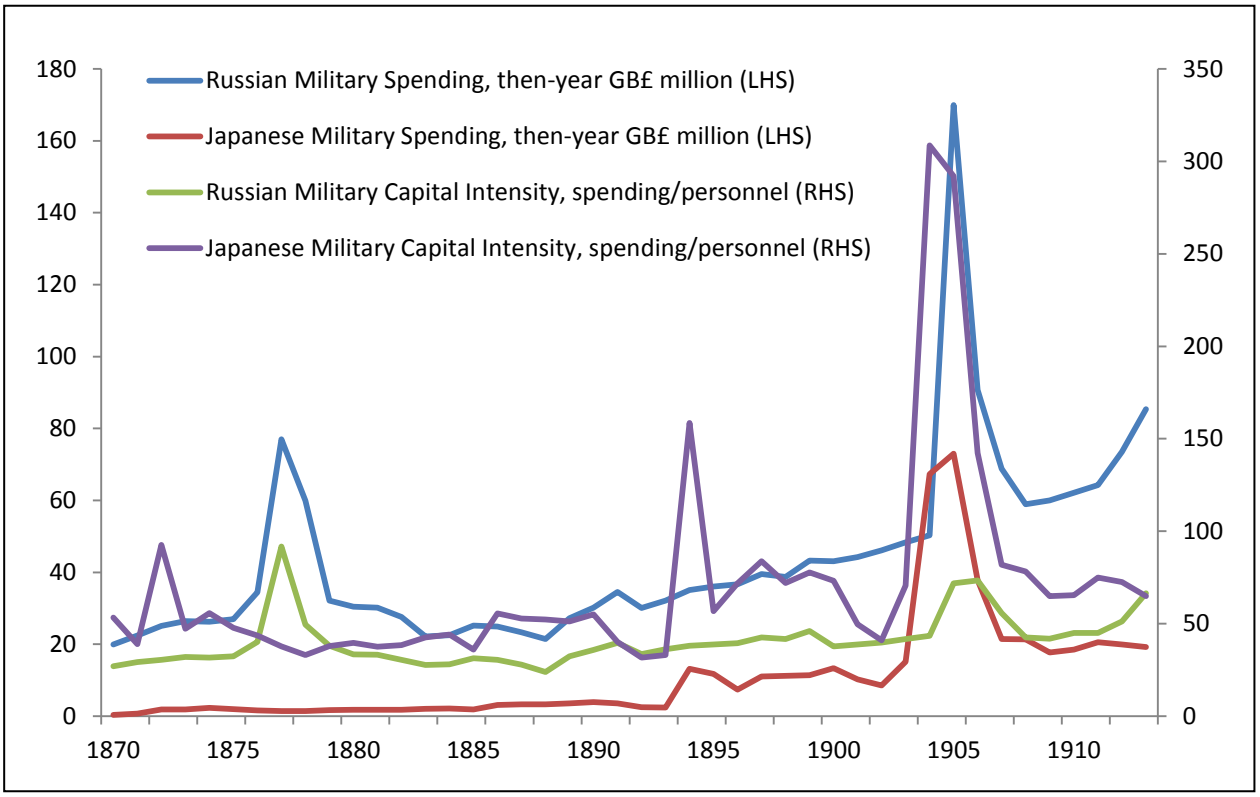
power dynamics. Specifically, the Japan of even a few years earlier would have been in no position from a military-industrial perspective to seek an out-of-area security buffer, as Tokyo was then doing in Korea, or – when it encountered potential rival imperial encroachment – to go boldly to war with a long-established European great power that possessed a standing army of 1.16 million (as of 1904 – see figure 37). The self-imposed 'Westernisation' of Japan, via technology sharing and market integration, that began following the 1868 Meiji Restoration saw the country make industrial strides that meant that by 1904, it was a major power. To be sure, Tokyo would still not have had anything close to the wherewithal to fight Russia in Europe. However, the two powers clashed on the extreme fringe of the Russian periphery, St Petersburg incurred serious logistical challenges in sending naval forces and military personnel to its Far East, and indeed, the ongoing relative underdevelopment of Russia in 1904 made harnessing its largely agrarian population and economy for military means relatively difficult. Accordingly, a country that Kennedy said 'wasn't even in the [Great Power] club' in 1890 proved more than a match for an unquestioned great power – albeit a less-than-fully-industrialised one – barely fifteen years later.[102]

Figure 41 provides data on both total military spending and military capital intensity for Russia and Japan over the 1870-1913 period. What is clear is that Russia was by far the superior in terms of overall defence spending for the whole period, but that Japan was superior in terms of military capital intensity for most of the period. Accordingly, Russian weight of numbers seems likely to have been countered to at least some extent by Japanese equipment and professionalism levels – especially given that the full weight of Russian numbers could not be brought to bear at such range. Given the discipline, commitment and skill that Japanese personnel – and the supporting public at home – are reported to have

[102] (Kennedy, 1987, p. 206)

displayed throughout the conflict, the argument that Japanese troops were in general qualitatively superior to their Russian counterparts seems to gain support; similar arguments can be made about the leadership and general competence of Japanese naval personnel.[103] The warship tonnage data in figure 39 tells a similar story about military capital intensity and Japanese military-industrial catch-up. In 1880, the Russian Imperial Navy was the world's third largest, whereas Japan had no navy to speak of; only 25 years later, Japanese maritime forces had advanced far enough to destroy two of Russia's three principal fleets, sinking 27 of the latter's warships. As such, it seems likely that the Russo-Japanese War represented a case of economic integration-induced relative power shifts playing a key role in the causation of a major power war, and may be considered a forerunner of the even more destructive systemic conflagration that followed nine years later.

Figure 41. The Northeast Asian Balance: Military Spending and Capital Intensity



Source: My calculations, based on data in Correlates of War: National Material Capabilities, Version 4.0.

[103] (Kennedy, 1987, pp. 208-209; Koenig, 2004)

Economic Integration, Differential Growth, and the Road to War in Europe, 1914

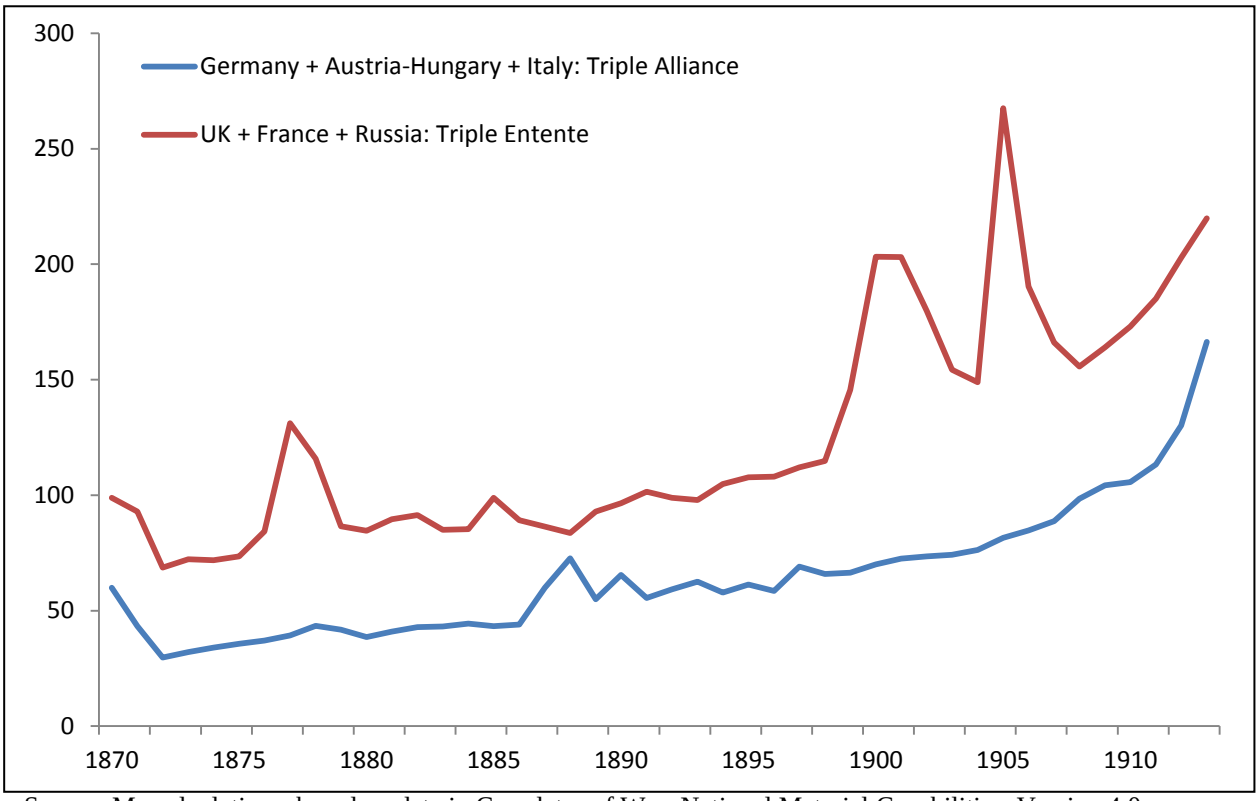
The Russo-Japanese War was a regional war amongst two major powers, and while it certainly involved large-scale fighting, neither faced extermination as a sovereign entity as the potential price of defeat; in short, it was a limited war. The Great War of 1914-1918, by contrast, was nothing of the sort; by its end, every major power in the system had taken sides, four empires had ceased to exist, and between 9.0 and 16.5 million people had been killed.[104] The purpose of this section is, once again, not to discover 'new' World War I history, but merely to fuse the discussion of economic integration and industrial power shifts contained above with scholarship from both political science and strategic history that identifies such shifts in the balance of power as having played a major role in the war's onset.

As Hew Strachan notes in his history of the origins of World War I, the central problem for the stability of European great power relations after German unification was that, 'Germany's position in Europe after 1871 was at once threatening and vulnerable – threatening because central Europe was now dominated by a major power, casting shadows over Russia to the east and France to the west, and vulnerable because the new state had long, exposed land frontiers in the same directions.'[105] This is security dilemma logic in action. Given its encirclement by other major powers, Germany had every incentive to improve its security position through whatever means it had available; indeed, it formed the Triple Alliance with Austria-Hungary and Italy in 1882 to shore-up its Central European position. Yet Germany's centrality and desire to improve its security position gave the other great powers sound reasons to fear it. The result was the formation in 1907 of the Triple Entente –

[104] The empires in question being the German, Austro-Hungarian, Ottoman, and Russian empires. On casualty estimates, see (White, 2010)
[105] (Strachan, 2001, p. 8)

a formal military alliance of the United Kingdom, France and Russia.[106] If Germany had felt *de facto* encircled prior to 1907, the effect was pressed home *de jure* from then onwards.

Figure 42a. The European Balance: Major Power Blocs' Defence Spending, GB£ million



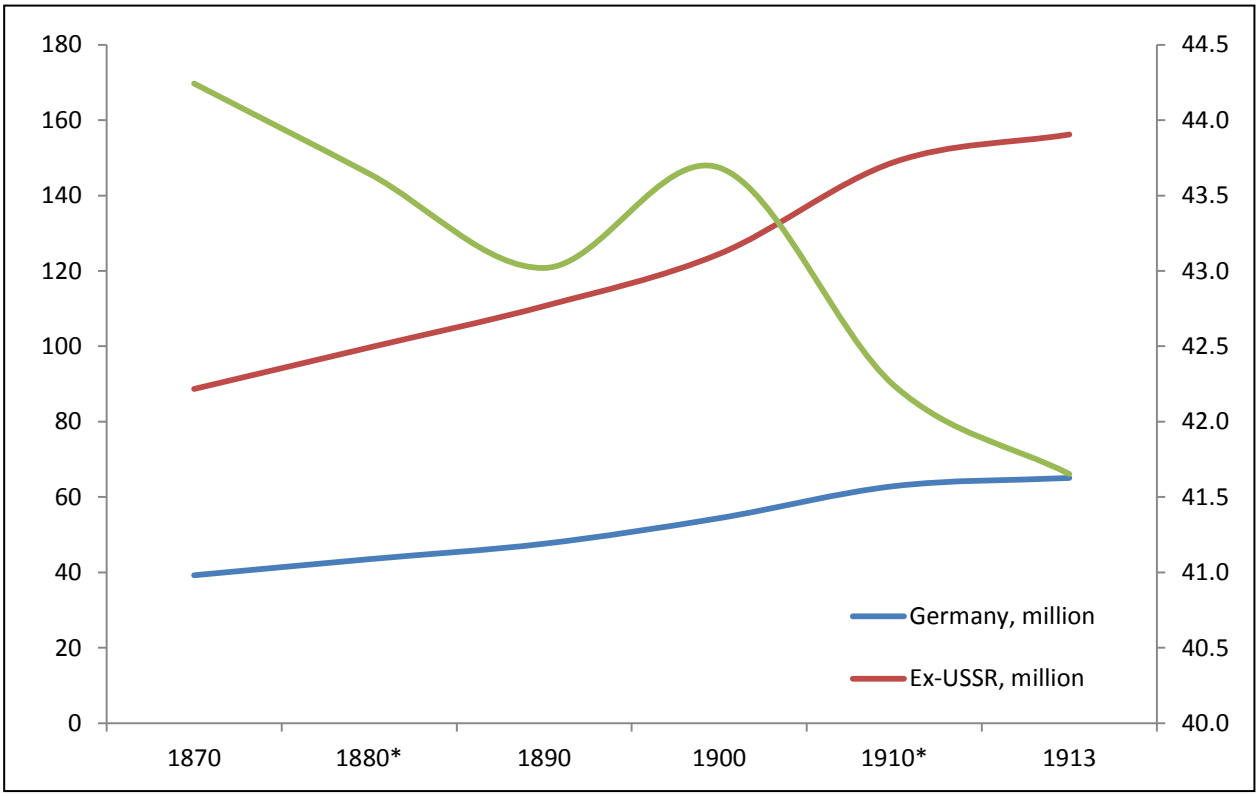
Source: My calculations, based on data in Correlates of War: National Material Capabilities, Version 4.0.

The severity of Germany's strategic encirclement is illustrated in figure 42a, which provides data on the military spending of the Triple Alliance and Triple Entente.[107] As was demonstrated earlier, by the middle of the first decade of the twentieth century, Germany was Europe's foremost industrial power, and also Europe's leading military power in terms of ground forces (the United Kingdom retained its naval lead) – and German leaders knew

[106] The original Franco-British alliance – the 'Entente Cordiale' – was more imperial than Euro-centric in motivation, given French and British needs to avoid clashes where their respective empires came into contact: (Strachan, 2001, p. 14) However, by 1906, it was clear to UK planners that Germany represented the principal European strategic threat, hence the decision to put aside prior Asian colonial tensions with Russia and join the pre-existing Franco-Russian Entente: (Strachan, 2001, pp. 18-19) See also (Mearsheimer, 2001, pp. 213-216)
[107] Correlates of War National Material Capabilities Dataset, Version 4.0; accessed online on 15 February 2011 at http://www.correlatesofwar.org/COW2%20Data/Capabilities/NMC_v4_0.csv. See also: (Singer, May 1988; Singer et al., 1972)

this.[108] Crucially, however, they were also aware that their two principal allies were weak, relative to the other European major powers, meaning that the Entente that encircled them still posed a grave threat unless it could be dealt with in unit-level chunks.[109]

Figure 42b. German and Russian (ex-USSR) Populations, million (LHS), and German Population, % of Russian population (RHS)



Source: My calculations, based on data in Maddison (2003). *Former USSR data not available for starred years – values generated by interpolation between flanking data.

Moreover, just as Germany's rise over the 1870-1914 period had been facilitated by economic integration, with capital goods exports, financial flows and technology diffusion from the United Kingdom and France all serving to drive industrialisation, German planners were now aware that the same mechanisms were taking effect on Russia – both vis-à-vis Germany itself, and particularly vis-à-vis economically atrophying Austria-Hungary.[110] Russia was of course coming from a much lower developmental base than Germany, given its

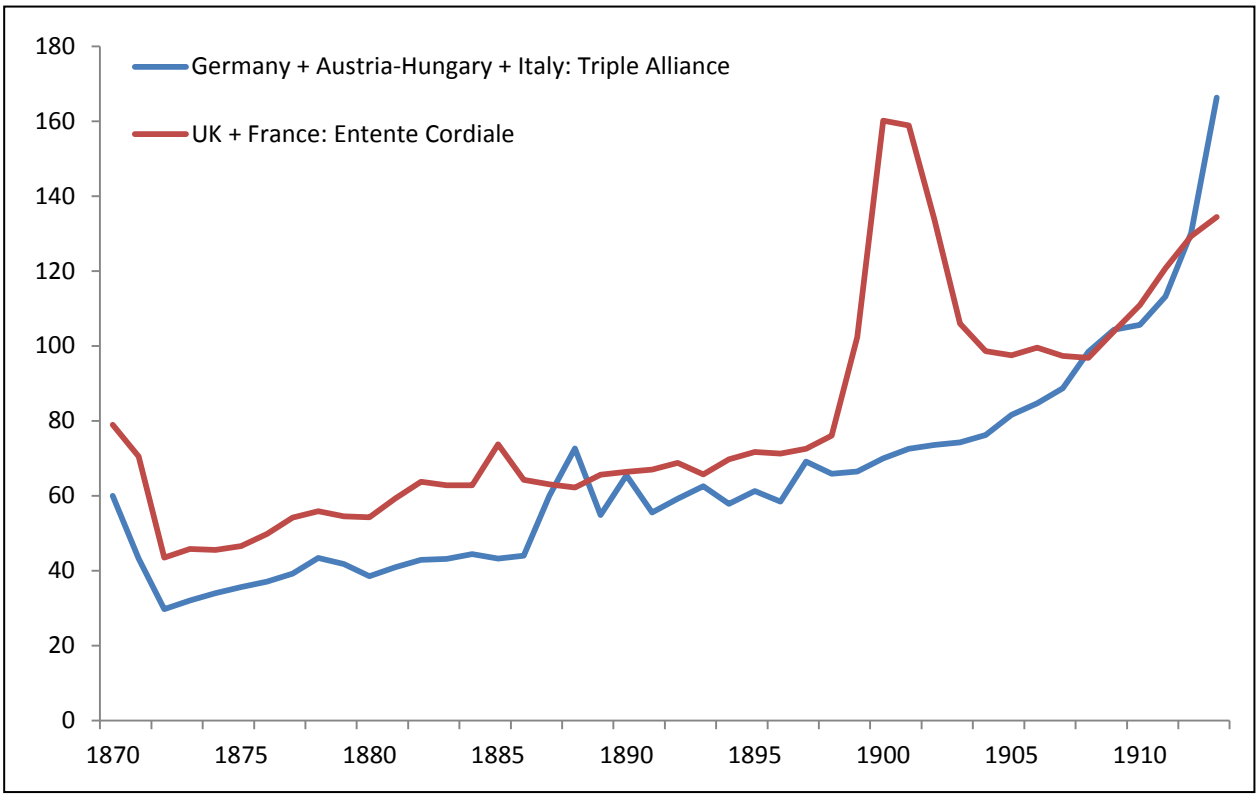
[108] (Copeland, 2000, p. 57)
[109] (Copeland, 2000, p. 63)
[110] (Copeland, 2000, p. 57)

large and dispersed agrarian population, but by the twentieth century, Russian industrialisation was underway, as the array of data presented earlier in the chapter demonstrated. The defeat of 1905 retarded Russia in military terms, but the subsequent military reorganisation and rearmament in the wake of the lessons learned meant that its forces had rebounded to once again be of major consequence to the European balance of power by around 1911-12.[111] Moreover, as figure 42b makes clear, Russian demographic trends gave German strategists cause for concern, since the former's GDP per capita only had to remain constant for its overall national economy to keep growing in relative terms. [112]

The result was that by the end of the 1870-1913 period, Europe had been transformed by the integration mechanisms detailed previously into a situation of unbalanced multipolarity; moreover, the leading power was also the one encircled by the next-most-capable three.[113] To put it in dynamic differentials terms, one great power, Germany, had risen fast – generating a security dilemma with the two previously dominant powers, the United Kingdom and France, on its way up – and was now contemplating the rise of another, Russia, in turn generating further sources of tension.[114] What incentive structure did this produce for Germany, currently a European potential hegemon but one encircled by other great powers and unlikely to retain its lead indefinitely? The answer was a desire to knock out at least one of the two flanking powers, Russia and France, via some sort of diplomatic crisis that could be transformed into a decisive military victory, leaving Germany free to either turn on the other power, or at least not have to worry about it as a potential source of external aggression in future.[115]

[111] Although Russia had not yet completed its rearmament, which gave the Germans a degree of certainty that the Russians would try to avoid war in the short term: (Copeland, 2000, pp. 62-63)
[112] (Maddison, 2003b)
[113] (Mearsheimer, 2001, p. 215)
[114] (Copeland, 2000, pp. 57-117) See also (Gilpin, 1981; Organski & Kugler, 1980)
[115] (Copeland, 2000, pp. 57-117; Lieber, Fall 2007; Mearsheimer, 2001, p. 215)

Figure 43a. The Western European Balance of Blocs' Defence Spending, GB£ million

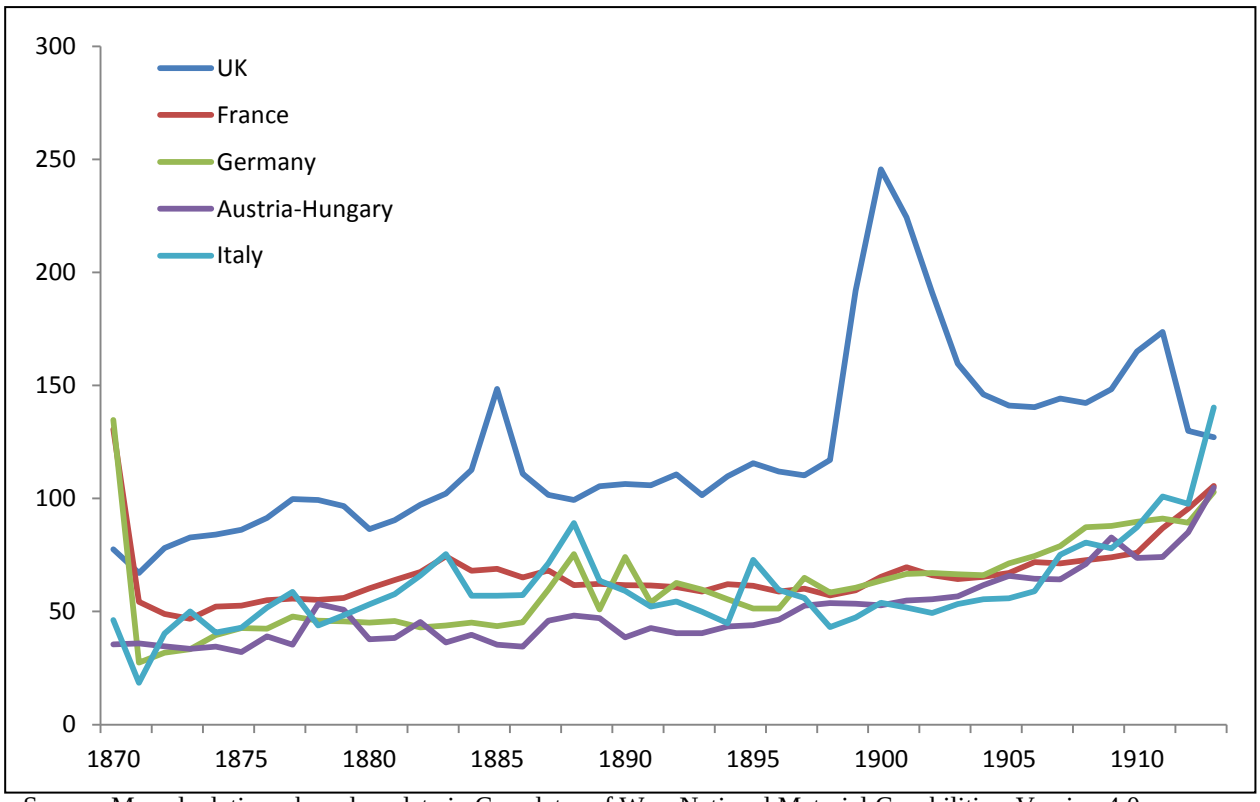


Source: My calculations, based on data in Correlates of War: National Material Capabilities, Version 4.0.

Such a crisis presented itself in July 1914, when Austria-Hungary invaded Serbia in retaliation for the assassination of Archduke Franz Ferdinand. Unlike prior crises, when a Germany that considered itself less-than-fully-ready for war reined in its Austro-Hungarian ally – for example, during the Balkan crises of 1912-13 – in 1914, Germany pushed for war.[116] Berlin encouraged Vienna to go ahead with an outright invasion, and then foreclosed Russian efforts to construct a face-saving negotiated settlement by manipulating the two powers' diplomatic communication and then declaring war on Russia itself on 1 August.[117] Germany then turned its forces to the west, with the intention of defeating – or at least severely weakening – France while the Austro-Hungarians stalled the Russians.

[116] (Copeland, 2000, pp. 63-75)
[117] (Copeland, 2000, pp. 79-81)

Figure 43b. The Western European Balance of Powers' Military Capital Intensity



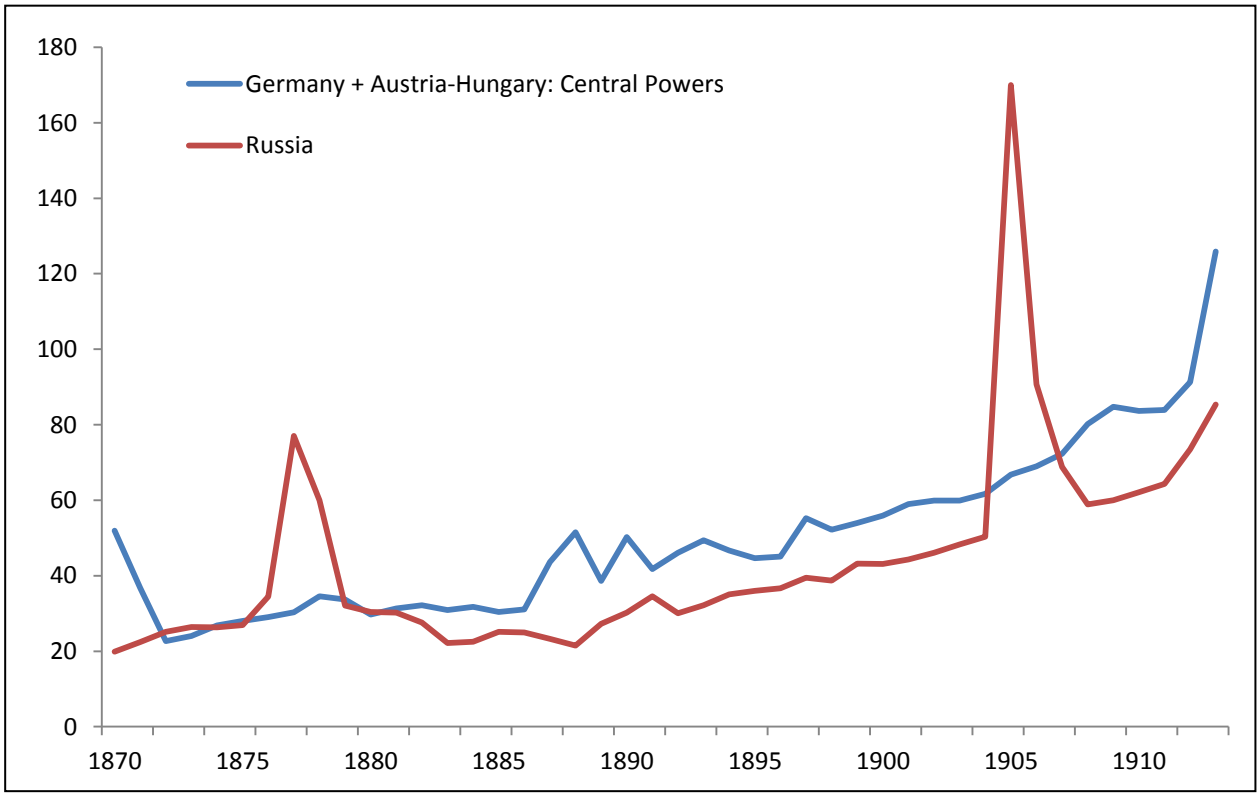
Source: My calculations, based on data in Correlates of War: National Material Capabilities, Version 4.0.

Did attempting to break-up the Entente by going after its two continental members in quick succession make sense from a military-industrial perspective? Figures 43a and 43b consider this question first in the context of Western Europe, where the Germans launched their first major offensive against a great power.[118] The first chart, figure 43a, plots the defence expenditure of the two Western European members of the Entente against that of the Triple Alliance (the Italians did not actually fight in 1914, on the grounds that their defensive alliance commitments did not extend to wars initiated by alliance members, but the Germans could reasonably have calculated their contribution as part of Triple Alliance strength in the western theatre as of 1913). As the data shows, by 1913, Germany and its allies had opened a substantial lead over combined UK and French military spending, suggesting at least

[118] Correlates of War National Material Capabilities Dataset, Version 4.0; accessed online on 15 February 2011 at http://www.correlatesofwar.org/COW2%20Data/Capabilities/NMC_v4_0.csv. See also: (Singer, May 1988; Singer et al., 1972)

reasonable prospects for victory on the Western Front for the first time since Prussia's 1871 defeat of France. Likewise, figure 43b tells a similar story from a military capital intensity perspective. While the United Kingdom retained its lead on this measure over Western European powers (with the exception of Italy), its lead had been eroded to the point where the gap was less significant; moreover, as discussed earlier, the UK naval lead had been reduced by enough for the German High Seas Fleet to at least constrain the Grand Fleet's freedom of operation. And of course, if the United Kingdom had not honoured its alliance commitments to the continent – as many German planners still calculated would be the case in 1913 – then the balance would have been decisively in favour of Germany relative to France.

Figure 44a. The Eastern European Balance of Blocs' Defence Spending, GB£ million

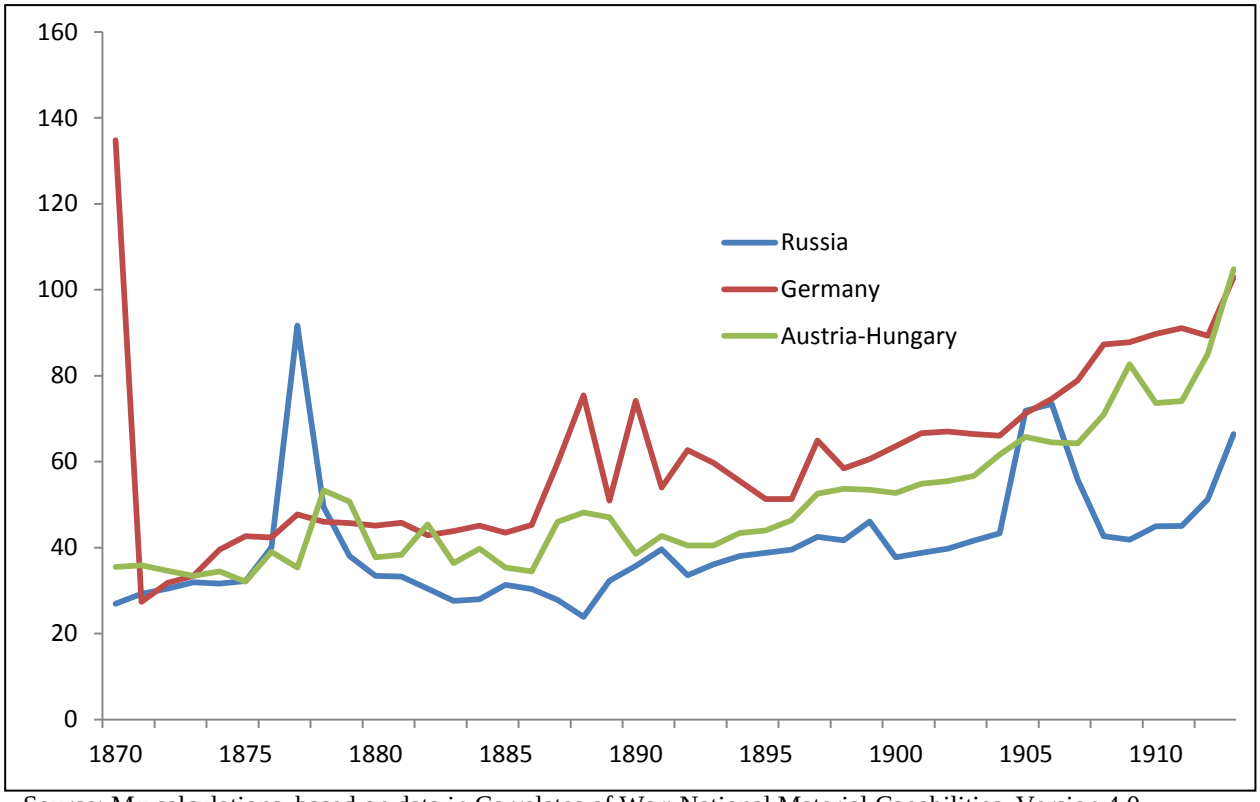


Source: My calculations, based on data in Correlates of War: National Material Capabilities, Version 4.0.

Can the same conclusions be drawn regarding the Eastern European balance? Figures 44a and 44b suggest that they can. Combined German and Austro-Hungarian military

spending comprehensively outstripped Russian spending from the latter's post-1905 demobilisation onwards, Russian rearmament efforts notwithstanding, as figure 44a makes clear. Likewise, German and Austro-Hungarian military capital intensity was superior to Russia's for most of the period, with their lead again increasing after post-1905 Russian demobilisation had run its course. Moreover, unlike the protracted stalemate of the Western Front, German forces *did* enjoy comprehensive success in the East, capturing Warsaw and ultimately knocking the poorly-trained, -led, and -equipped Russians out of the war by 1917.[119] Accordingly, the idea that the Entente could be broken and Germany's long-term security thus guaranteed by hitting both of its continental European members hard in quick succession does not seem crazy, even if the plan ultimately backfired.

Figure 44b. The Eastern European Balance of Powers' Military Capital Intensity



Source: My calculations, based on data in Correlates of War: National Material Capabilities, Version 4.0.

[119] (Mearsheimer, 2001, p. 216)

In light of the discussion in this section, coupled to the prior discussion of economic integration in the 1870-1914 period and its impact on the international distribution of industrial output, there is a strong case to suggest that the dynamics leading up to the outbreak of World War I support this dissertation's overall theory. Economic integration-induced relative power shifts left Germany as a power capable of defeating any one other European great power, both in terms of its then-extant military capability and its underlying industrial wherewithal to generate more power once hostilities began; this fits with both polarity shift and dynamic differentials understandings of changes in the balance of power. Given both its encirclement by other great powers – a security dilemma generated by its very rise – and its concern over the long-term development of Russia, planners in Berlin sought to take an opportunity to knock at least one half of the Entente out for good. Such planners were probably aware that a two-front war would be costly and could become protracted, although there may also have been a 'cult of the offensive' and a perception of first-move advantages that conditioned their thinking; either way, however, they decided that it was worth an attempt, and that is what is important from this dissertation's perspective.[120]

Of course, it did not pay off as a plan. Ironically, the intervention of the United States – the other, even *greater* integration-empowered economy of the 1870-1914 period – on the side of the Entente in 1917 meant that the Central Powers had comprehensively lost any military-industrial superiority that they ever had by the war's latter stages. Nevertheless, given that the 1870-1914 case has been shown to be a period of deepening economic integration driving a shift in the balance of economic power, which in turn drove a shift in the balance of military-strategic power, which *in turn* contributed to the onset of a devastating World War, it therefore constitutes persuasive evidence in support of this dissertation's overall theory.

[120] (Lieber, Fall 2007; Mearsheimer, 2001, pp. 215-216; Snyder & Lieber, Summer 2008; Van Evera, 1999, pp. 236-239)

Caveats and Qualifications to the Overall Case Findings

The above discussion shows that the 1870-1914 period is a good fit with this dissertation's overall theory. Nonetheless, no period of 'real' history can ever be a perfect fit with a theoretical model. This is because the very merit of such models is that they are simplifications, intended to cut away a large measure of the historical idiosyncrasies surrounding past international events with a view to seeing the variables that matter most. Accordingly, every historical case – even an 'easy test' like 1870-1914 – will have aspects that do not fall neatly within the purported causal framework. The purpose of this section is to acknowledge such caveats and qualifications, thereby demonstrating that the case continues to support my theory even when its idiosyncrasies are taken into account, and thus avoiding the charge of studying only the supportive aspects of the relevant history.

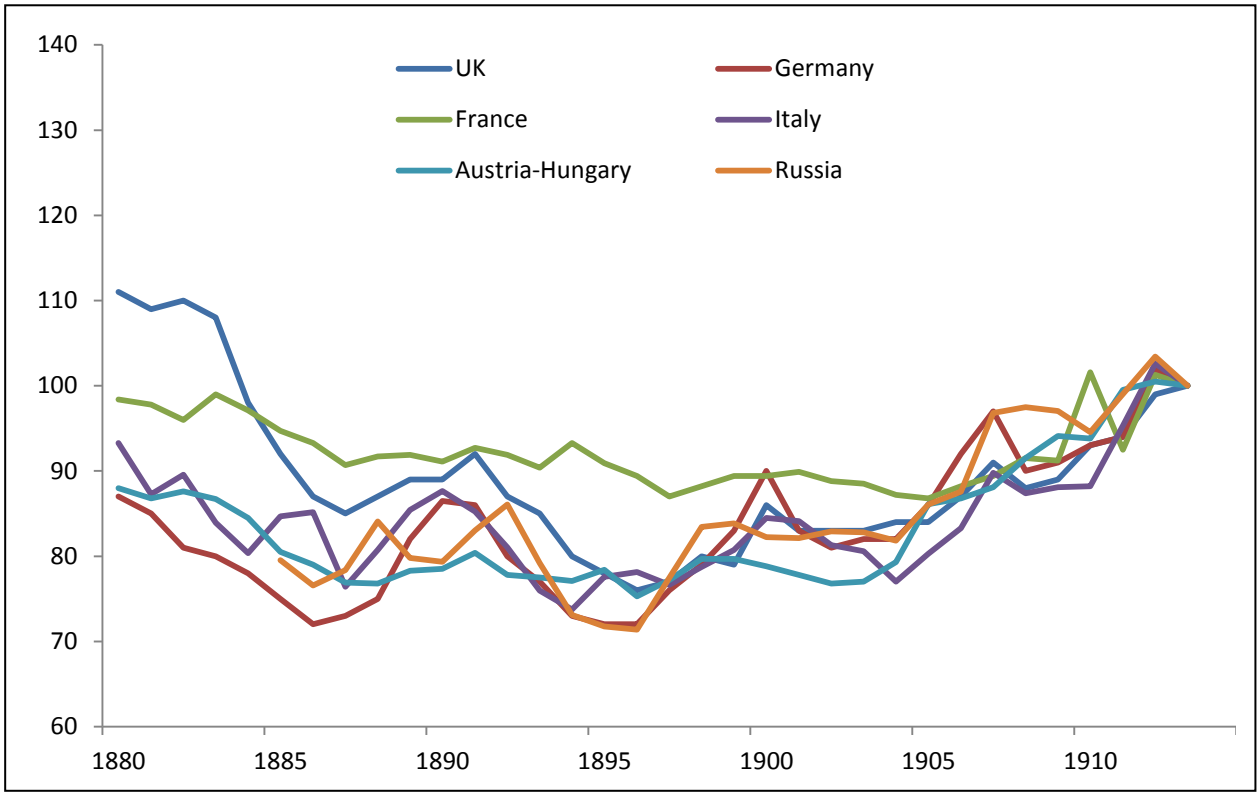
Economic Caveats

The first important way in which the economic history of 1870-1914 must be qualified is that it was not some uninterrupted period of continually booming economic growth. As a *whole*, it was a period of great dynamism in the world economy, and as was demonstrated above, the differentials in this dynamism were crucial in driving the geopolitical outcomes of the age. Yet *within* the period – which, after all, amounted to going on for half a century – there were significant cyclical changes, with intra-period economic booms being followed by slowdowns and even recessions. Figure 45 presents price data for the six European major powers between 1870 and 1913, with the intra-period cyclical shifts clearly visible.[121] Accordingly, while 1870-1914 is a period that generally supports the dissertation's overall arguments that integration can generate healthy growth in general and

[121] (Accominotti, Flandreau, & Rezzik, 2010) See also (Flandreau et al., 2010, pp. 88-94)

catch-up growth for follower economies in particular, it is important to acknowledge that the correlation between integration and growth was not simply linear.

Figure 45. European Powers' Exchange Rate Adjusted Price Levels, 1913=100



Source: The Global Finance Database, accessed on 15 February 2011 at http://eh.net/databases/Finance/. I thank Marc Flandreau for generously sharing this data with me.

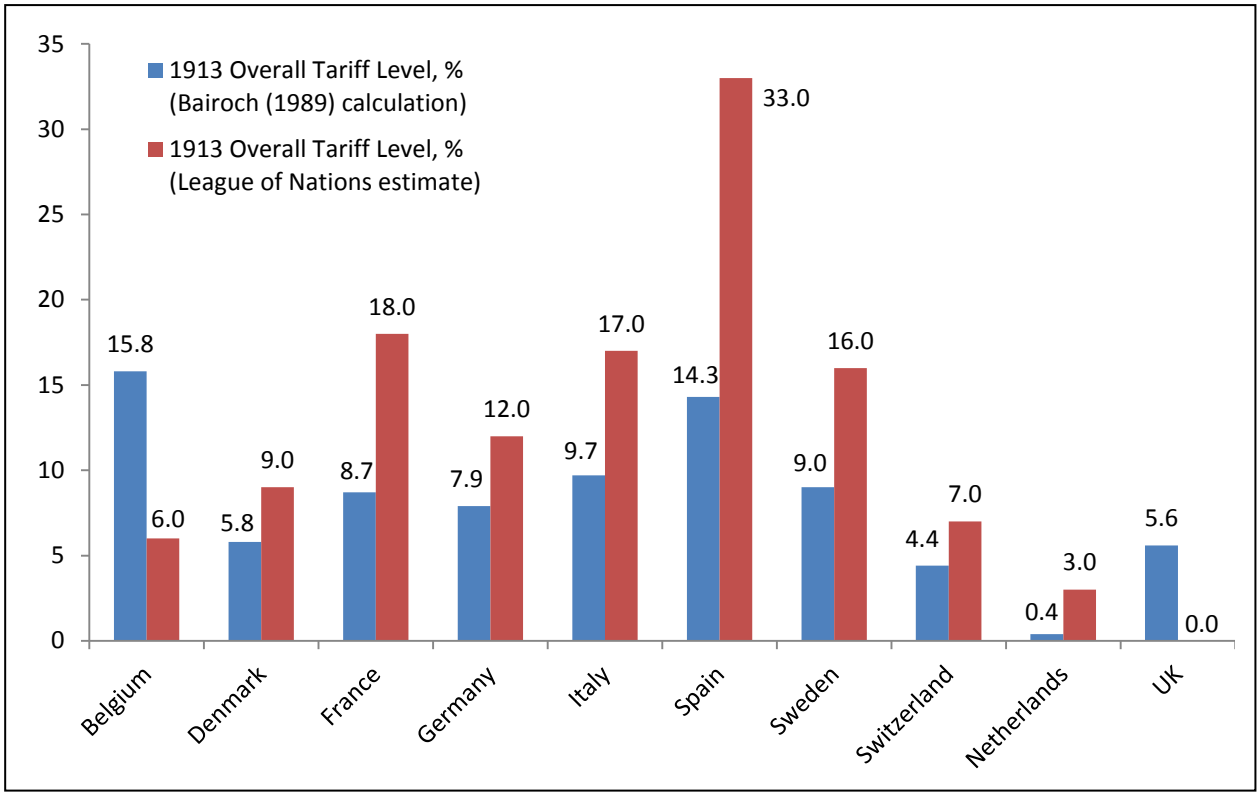
Second, it is important to be aware that while 1870-1914 was a period of deepening economic integration in general, this globalization – just as today – was not universally popular. On the contrary, sectors threatened by international competition pushed hard for trade protection, and this was manifested in the implementation of a combination of agricultural and manufacturing tariffs in countries where the political system was responsive to such pressure.[122] Indeed, referring back to figure 25 and the discussion of factor price convergence, the limited degree of spread compression in certain wheat trading dyads can be

[122] (O'Rourke & Williamson, 1999, pp. 93-118)

attributed to such pressure for agricultural protection.[123] Figure 46 presents two estimates of European countries' 1913 overall tariff levels.[124] Predictably, the 'ideological' free-traders – that is, countries with a political system configured to take account of long-standing maritime commercial interests, most notably the United Kingdom, Denmark, and the Netherlands – displayed the lowest tariff levels, while the more 'continentally-oriented' powers moved towards greater protection. Likewise, from the 1880s onwards, there is evidence of migration policy becoming progressively more restrictive, as 'New World' countries sought to control the vast influxes of people that they were attempting to absorb, particularly low-skill labourers.[125] Moreover, Paul Bairoch has shown that those states participating in international economic exchange that maintained higher tariff levels experienced somewhat stronger relative growth.[126] Yet crucially for my theory, despite the political backlash in sectors with something to lose from integration, the overall effect of protection was not sufficient to overcome the powerful convergence-driving effects of integration, meaning that 1970-1914 remains a supportive case.[127] Indeed, this is why the Bairoch finding is not incompatible with the argument presented here: the key point of the case is not the trade *policies* in place, but the measurable *fact* that international economic exchange nevertheless expanded.[128]

[123] (O'Rourke & Williamson, 1999, pp. 97-105)
[124] (O'Rourke & Williamson, 1999, pp. 98-99)
[125] (O'Rourke & Williamson, 1999, pp. 185-206)
[126] (Bairoch, November 1972; Bairoch & Kozul-Wright, March 1996)
[127] (O'Rourke & Williamson, 1999, p. 101)
[128] After all, if trade expands even despite the presence of tariffs, then those states reaping larger fiscal rewards from their tariffs may indeed be expected to grow quicker; indeed, more recent research suggests that – in aggregate – tariffs were negative for growth, and the positive association comes more from the fiscal benefits that resource-rich settler economies (such as Canada and Australia) derived from their imposition: (Tena-Junguito, April 2010) More generally, the finding that certain significant states maintained higher tariff levels than others is perfectly consistent with the finding that this same group also reaped catch-up gains from international economic exchange, given that the more trade open states – most notably the UK – were also the lead economies towards which follower economies converged in the late nineteenth century. In short, the salient point here is that international economic exchange *did* expand, rather than the tariff level that accompanied – and, indeed, failed to prevent – such an expansion. Finally, Bairoch and Kozul-Wright *do* suggest that technological diffusion and international financial flows – the other dimensions of economic globalization central to the dissertation's argument – contributed to catch-up growth within the Euro-Atlantic economies, and their scepticism over the link between trade openness and growth applies more to trade (a) outside the 'convergence club' of major powers and (b) in primary products rather than industrial goods: (Bairoch & Kozul-Wright, March 1996, pp. 18-25)

Figure 46. Overall European Tariff Levels, 1913*



Source: O'Rourke and Williamson (1999), Table 6.2 (pp. 98-99). *'Overall Tariff Level' here a weighted function of import tariffs on manufactured and agricultural goods.

Third, it is important to note that while 1870-1914 gets dubbed the first wave of *global*ization, it remained predominantly an Atlantic-area phenomenon, with flows within and between Western Europe and North America representing its most substantial dynamic.[129] To be sure, there were also non-trivial flows of goods, capital and technology to Latin America and within the British Empire, as well as to Japan, but it remained greater by several orders of magnitude within its relatively developed region of origin.

Following on from this, it is just as important to note that integration did indeed take place predominantly between – and empower – states that were *already* relatively developed. To be sure, Germany and the United States were less industrialised than the United Kingdom in 1870, but relative to everyone else, they were also part of the developed club; indeed, as discussed earlier, they were also already major innovators in key sectors by the mid-

[129] Hence the title of O'Rourke and Williamson's landmark book on the subject: (O'Rourke & Williamson, 1999)

nineteenth century.[130] They also already constituted major powers at that time, even if their full rise was still to come. Accordingly, this period must be thought of more as an epoch of the diffusion and subsequent improvement of UK innovations from its prior period of industrial pre-eminence to follower economies, rather than as one in which the United Kingdom continued to lead the world on every technological front.

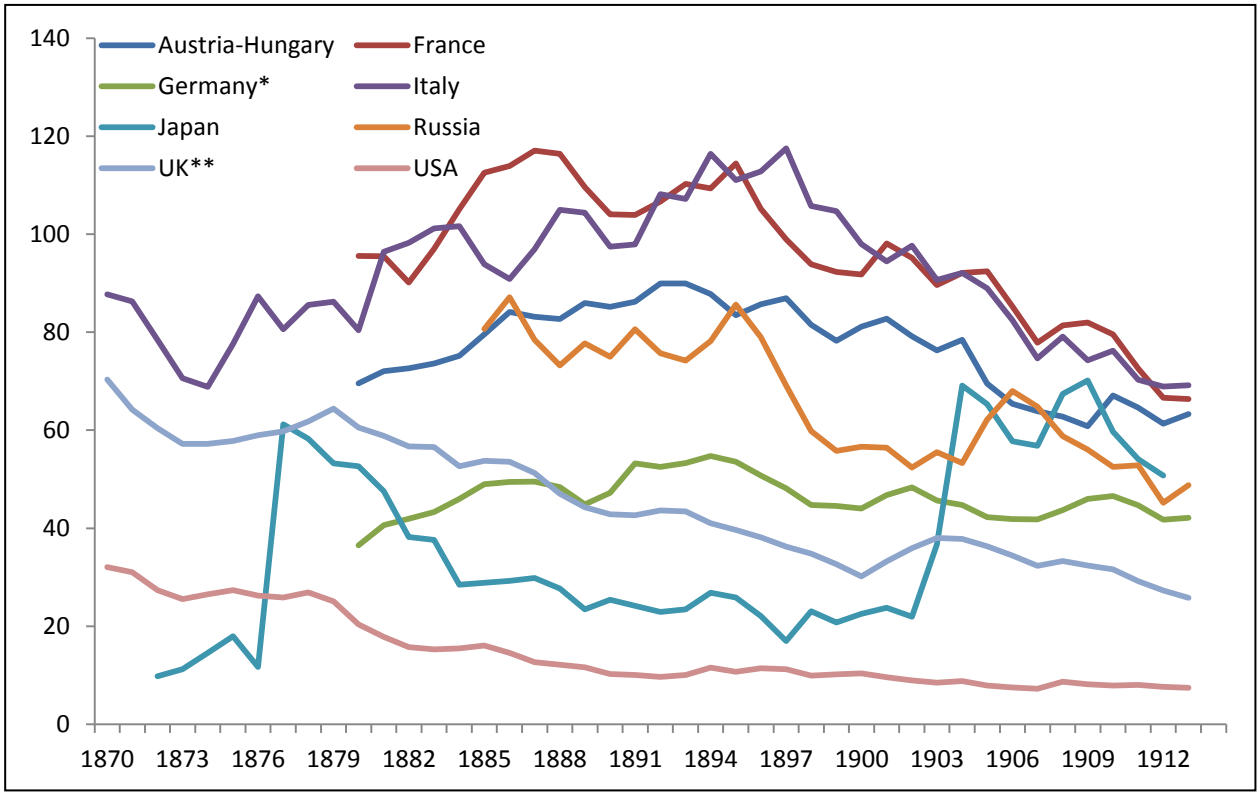
Fifth, although also following from the third point, the importance of effective economic governance to economic catch-up and subsequent major power status is amply demonstrated by the Latin American experience of 1870-1914. As figures 16a and 16b demonstrated, Latin America had received substantial inflows of foreign capital by 1913, and was on an impressive development trajectory. However, in the absence of effective governance, such financial inflows actually became destabilising.[131] Indeed, the region's twentieth century political and economic experiences were such that it then fell further behind the development levels of Western Europe and North America, only really resuming the catch-up growth process in the 1990s – and even then, only in the countries with sound economic management.

Sixth, and most importantly, the catch-up growth of Germany and the United States cannot be wholly attributed to integration drivers, as noted at the relevant places previously. Germany, for instance, had to embark on a conscious domestic industrialisation effort, and indeed, was not even a major recipient of UK foreign investment – although its industrialisation *was* heavily dependent on French loans (see figure 17a), and the UK financial sector facilitated its catch-up growth in other ways (for instance, by financing and arranging German merchants' non-European trade). The unifying wars of 1864, 1866, and 1870-71 were also clearly important in giving the German state the scale and fiscal-administrative capacity to rise economically and militarily. Likewise, as figure 17b makes

[130] (Carreras & Josephson, 2010, p. 54)
[131] (Bairoch & Kozul-Wright, March 1996, p. 25)

clear, there *was* a correlation between UK net foreign investment and US gross fixed capital formation – but the gap between the two was large, demonstrating the significance of domestic savings and investment for the US catch-up experience.

Figure 47. Major Powers' Government Debt-to-GDP Ratios, 1870-1913, %



Source: Reinhart and Rogoff (2009). Data accessed online on 27 September 2012 at http://www.reinhartandrogoff.com/data/browse-by-topic/topics/9/. *Germany data is for both central and provincial government debt, due to the federal regions' independent borrowing capability; all others are for central government only. **UK data is for net public debt; all others are gross public debt.

More generally, the United States' sheer size, birth rate, and continued territorial expansion in the nineteenth century added to US output in a way not directly connected to integration, meaning that the importance of the mechanisms described here should not be overplayed. Indeed, as the GDP per capita and productivity data presented earlier demonstrated, while the UK was the start-of-period lead economy, this development lead vis-à-vis the United States was gone by the twentieth century. Even small increases in the productivity of any given square mile of US territory yielded huge gains in the aggregate, and

the importance of the domestic development story must therefore not be understated. Nonetheless, even here, the integration processes played a facilitating role, insofar as capital goods trade, technology transfer, and European finance were of considerable importance in opening and raising the productivity of US territory away from the East Coast's longer-standing industrial centres. Accordingly, this chapter acknowledges that the integration-convergence mechanisms cannot be credited with *all* – or maybe even most – of the shift in the balance of economic power that took place between 1870 and 1914. But crucially, the evidence demonstrates that a significant portion of the shift *was* driven by integration-facilitated catch-up convergence, meaning that the theory's claims of explanatory power are supported.

Seventh, it is important to note the fiscal dimension of the great powers' rise and decline in this period. Figure 47 presents data on the public debt-to-GDP ratios of the major powers between 1870 and 1913.[132] It is noteworthy that those countries that experienced integration-enabled catch-up growth – the United States, Germany, Russia, and Japan – are among those with a lower public debt burden.[133] Of course, this fits with the causal story being told here, as – following Kennedy's logic[134] – declining great powers suffering relative economic atrophy, such as France and Austria-Hungary (like the Dutch in the eighteenth century, as discussed in Chapter V), attempted to sustain their relative military position through higher relative borrowing.[135] However, insofar as fiscal overstretch can also be an

[132] (Reinhart & Rogoff, 2009)
[133] Note too that this data is probably over-favourable to the UK, for which net debt rather than gross debt is listed, and under-favourable to Germany, since central government debt was only a small relative proportion of the total public debt figure displayed. That said, of course, the UK fiscal position still appears solid compared to that of other declining powers, such as France, reflecting its still-high productivity levels and enduring absolute economic strength (decline being only relative).
[134] (Kennedy, 1987)
[135] Although note too that *most* great powers' overall debt load fell between the late nineteenth century and 1913, consistent with the period being one of robust *absolute* growth across the major powers – even those, such as France and Austria-Hungary, that were in *relative* decline. The exception to this general debt downtrend was late-developing Japan, which experienced a significant public debt expansion between 1872 and 1913, as it rapidly transformed from an antiquated feudal system into a modern fiscal-administrative state, and particularly after mobilising to fight Russia in 1905.

exacerbator of relative economic decline, as tax burdens and private-sector borrowing costs are pushed up, this also suggests that the major powers' relative fiscal standing played an *independent* role beyond the scope of integration-convergence theory in contributing to the power shifts seen in the run up to World War I, and this must be borne in mind.

Finally, as a methodological point, it is important to note that any argument that relies heavily on historical economic data must do so with caution. I have subsequently utilised an array of different data sources where possible, so as to triangulate the overall findings and prevent their overreliance on any one set of historical estimates. Indeed, I am confident that I have assembled enough data that all points in broadly the same direction for the overall findings to be considered robust. Nevertheless, insofar as data of all kinds – on economic integration, industrialisation levels, and comparative military strength – from the 1870-1914 period, like the 1581-1795 period, is unlikely to be as precise as it could be and inevitably involves a degree of estimation on the part of the dataset's assembler, the potential for inaccuracy must be acknowledged.

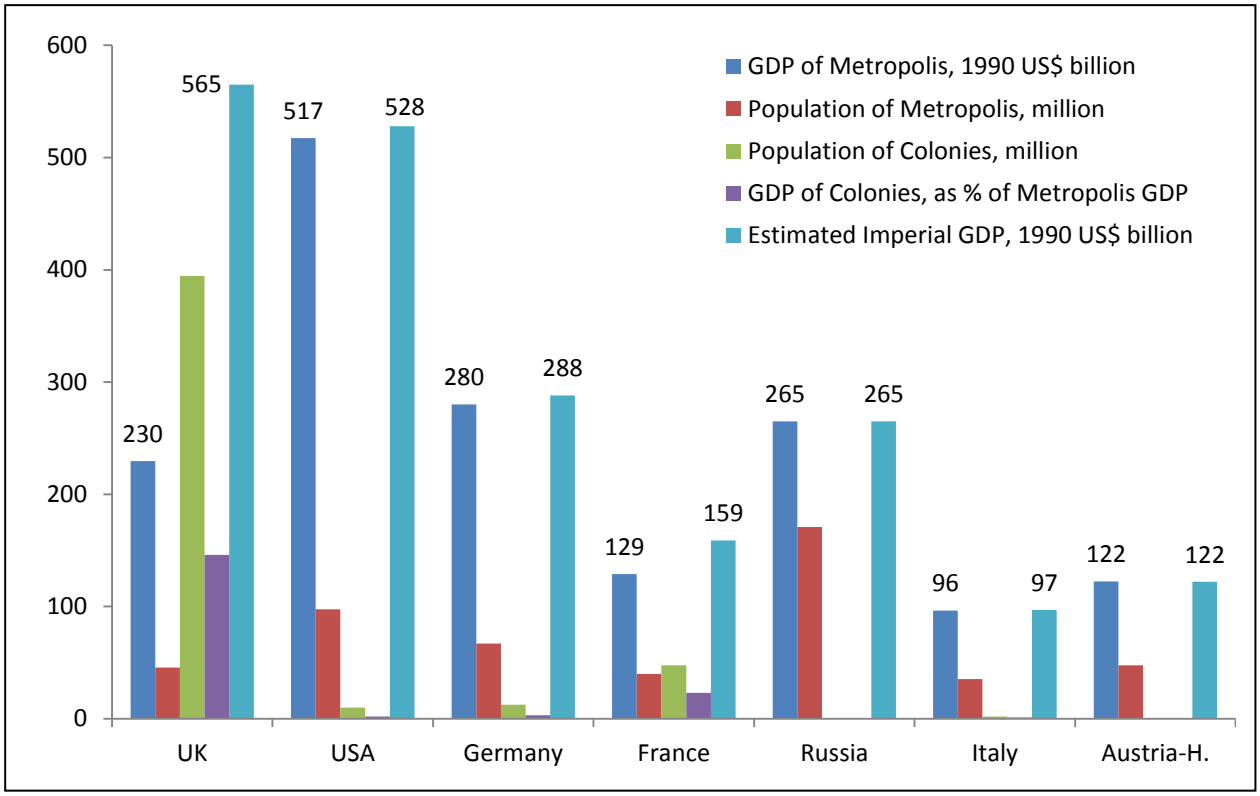
Military-Strategic Caveats

The section above qualified the economic dimension the chapter's general findings drawn from the 1870-1914 case with some important historical caveats. This section does the same for the geopolitical, military and strategic dimensions of the argument.

First, it is important to note that once relative imperial output is taken into account, the shift in the overall balance of power may not have been *as* drastic as the core national figures for 'metropolis' states – that is, the Western state that built each empire – appear to suggest. Figure 48 presents data on the national economic output versus the total imperial economic output of the major powers as of 1913. Data on respective populations is also included. The overwhelming impression is that, while all of the other major powers' imperial

possessions made only small contributions to the net resource base that they could draw upon, the British Empire more than doubled the size of the economic output and manpower controlled by London. Accordingly, the United Kingdom's military-industrial potential on the eve of World War I was obviously higher than a simple national comparison of the UK and German economic bases would initially suggest.

Figure 48. National Economic Size versus Imperial Economic Size, 1913



Source: Carreras and Josephson (2010), Table 2.1 (p. 34).

However, while this is a caveat, it does not undermine the overall argument that a substantive shift in the European balance of power took place between 1870 and 1914, thus rendering a war between Germany and Europe's lesser major powers likely. Just as Russia's large but predominantly agrarian economic output was of limited utility for making concentrated, technologically-advanced, high-tempo industrial war against Japan in 1904, so too the British Empire's industrial war-making potential in 1914 was significantly less than its headline GDP figure might suggest. This is because, outside of the United Kingdom itself

(and to a lesser extent Canada, Australia, and New Zealand), the British Empire was heavily populated with subsistence agriculture, meaning that only a relatively small fraction of its total economic output was available for anything other than food. Moreover, as a geographically dispersed Empire spanning heterogeneous regions and communities of the globe – and also as an Empire that had limited internal infrastructural development, while being linked by sea lanes vulnerable to submarine warfare and commerce raiders – its resources and manpower were difficult and costly to marshal for European war-making. Accordingly, while the United Kingdom's military industrial base vis-à-vis Germany was not *as* weak in 1914 as the prior discussions of the run-up to World War I may have suggested, the argument that Germany had become Europe's best-resourced military power by the end of the first decade of the twentieth century remains intact.

Second, an obvious rejoinder to any overly-deterministic argument about power shifts after 1870 as a driver of war in 1914 is that, on any aggregate metric of underlying industrial wherewithal, the international system's leading great power by 1900 was not Germany, but the United States. Yet it was the former, not the latter, that the other major powers feared, allied against, fought, and ultimately dismembered. Indeed, with the exception of the 1898 war against a lesser power, Spain, the United States did not engage in meaningful strategic competition with any of the European powers until 1917, when unrestricted German submarine warfare directed at the United Kingdom's Atlantic maritime supply routes took such a toll on US merchant vessels that the Americans were dragged into the war.

There are a number of responses to this challenge, several of which relate to the role of intervening variables between economic integration-induced power shifts (the independent variable) and the probability of conflict (the dependent variable). Domestic isolationist political inclinations, a preoccupation with consolidating 'internal' (that is, North American) borders and state cohesion, and a relatively liberal ideology (or at least a lack of a continental

European-style militarist governing class) may all have played a role on this front. Most crucial, however, seems the stopping power of water – the strongest geographical determinant of the offence-defence balance.[136] Given the vast moat between the United States and Europe, the European powers were in little position to threaten the core national security of the United States. Conversely, of course, without European allies facilitating the landing of US troops and supplies, US forces were themselves much less threatening to European states' national security than other European powers. Hence, the European powers' lack of *ability* to threaten the United States was reinforced by a lack of *incentive* to do so.[137] Oceanic moats also resulted in the European powers' interaction density with the United States being lower than with other European powers, rendering the risk of some clash of interests that could result in an escalatory international crisis lower at the transatlantic level than at the intra-European level.

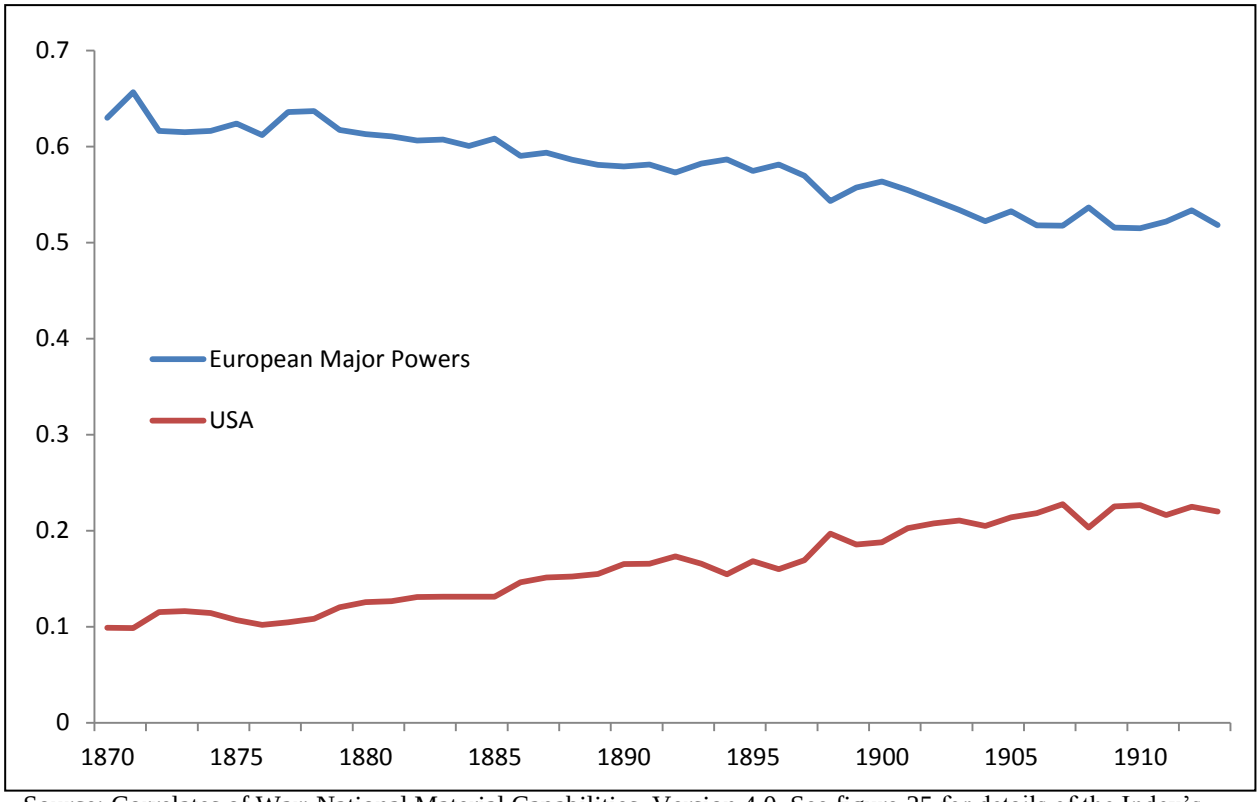
In short, the European powers were regionally preoccupied – and building on the offence-defence point, figure 49 shows that this made sense from an aggregate power perspective also.[138] The United States may have been the world's single most industrially capable power in the world by 1914, but in combined terms, the preponderance of world power still lay in Europe, which would further explain why even another maritime power – the United Kingdom – found dynamics on the continent much more threatening than the rise of the United States.

Moreover, insofar as US entry into the war was a result of German targeting of its merchant fleet, war between Germany and the United States *was* also a result of economic-

[136] (Blagden et al., Fall 2011; Levy & Thompson, Summer 2010; Mearsheimer, 2001, pp. 114-128)
[137] Note that the United Kingdom also enjoyed this geopolitical position, albeit to a lesser extent, courtesy of the English Channel. This goes a long way to explaining why UK forces eschewed a continental commitment until a power with the potential to overrun the whole of Western Europe (at which point the stopping power of water might not have been enough to offset the continental hegemon's power advantages) necessitated the deployment of a British Expeditionary Force.
[138] Correlates of War National Material Capabilities Dataset, Version 4.0; accessed online on 15 February 2011 at http://www.correlatesofwar.org/COW2%20Data/Capabilities/NMC_v4_0.csv. See also: (Singer, May 1988; Singer et al., 1972)

integration induced relative power shifts. After all, Germany would not have been concerned by US industrial potential being used to supply the Entente – a dynamic that helped to decisively tilt the military-industrial balance against the Central Powers – if the United States had never risen to economic pre-eminence in the first place. And as discussed earlier, while there was undoubtedly a major domestic drive behind US industrialisation, goods trade, capital flows and technology diffusion all played a facilitating role. Unrestricted submarine warfare may have backfired in grand-strategic terms,[139] but concern over US industrial might being used against Germany lay behind its initiation. As such, the fact that no European power meaningfully balanced against the United States until 1917 is not a significant problem for the theory, despite the Americans' industrial strength.

Figure 49. Shares of World Composite Capability (CoW), USA versus European Powers*



Source: Correlates of War: National Material Capabilities, Version 4.0. See figure 35 for details of the Index's composition. *The European major powers included here are the United Kingdom, France, Russia, Germany, Austria-Hungary, and Italy.

[139] (Geyer, 1986)

Conclusion

In their analysis of 1870-1914 economic integration, much-cited in this chapter, Guillaume Daudin, Matthias Morys and Kevin O'Rourke ask, 'could globalization have continued unabated after 1914, had the First World War not intervened'?[140] The argument presented here, however, suggests that World War I's 'intervention' was not an unfortunate coincidence that ended the 'first wave' of globalization, but rather a causal *product* of that very globalization.[141] Many European decision-makers had assumed prior to 1914 that deep economic integration had rendered war impossible, because no-one stood to gain financially; indeed, even as the crisis mounted in July 1914, the majority of such decision-makers were comparatively sanguine about the prospects for any conflict to be short and limited, due to the economic costs that war would impose.[142] Yet economic integration drove a relative power shift, and that relative power shift drove strategic competition, with outcomes that are plain to see; integration, and the power shifts that it brought about, can thus be considered a necessary condition of instability in great power relations in this case. Of the two countervailing mechanisms – economic interdependence (a source of stability) and integration-convergence (a source of destabilising power shifts) – the latter was more influential, and systemic war was the result. Moreover, insofar as World War II can be seen largely as a product of the political conditions created by the end of World War I[143] – the two conflagrations can to an extent be seen as part of a single whole conflict over the European balance of power, specifically the respective positions of France, Britain, Russia, and most of all Germany – the integration-convergence process can be seen as having an important causal role in the two most devastating systemic wars of all time. The full extent of this applicability could be the subject of valuable future scholarly enquiry.

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[140] (Daudin et al., 2010, p. 6)
[141] For a similar argument that relies on a domestic-political purported causal mechanism, see (Rowe, March 1999, Spring 2005)
[142] (Joll, 1992, pp. 161, 165)
[143] (Overy & Wheatcroft, 2009, pp. 29-46)

In terms of a congruence test, economic integration correlated with a shift in the relative balance of power, which in turn correlated with great power competition and ultimately war – both in 1904, and again in 1914. And from a process-tracing perspective, we have seen that integration contributed to economic catch-up growth by follower economies, and that such catch-up growth drove a shift in the overall balance of power that subsequently contributed to the onset of both the Russo-Japanese War and World War I. This is thus a larger and more important argument than the simple recognition that the failure of economic interdependence to prevent war in 1914 is a problem – or at best an anomaly – for liberal IR theory.[144]

Of course, we must remain wary of a degree of inevitable endogeneity in the observed outcomes: a country's trade is likely to rise as it industrialises, meaning that trade itself cannot take all of the credit for the observed industrialisation, for example. Nevertheless, there seems enough evidence to reasonably conclude that economic integration was at least partially responsible for shifts in the balance of economic power, and the subsequent geopolitical results. In short, this chapter has demonstrated that economic integration in the 1870-1914 period played a considerable role in causing the first truly global Great War. Insofar as such a conclusion bears out this dissertation's overall theoretical argument, the integration-convergence model of major power conflict has demonstrated that it possesses significant explanatory power on a crucial case.

[144] For an argument that the outbreak of World War I did *not* represent a failure of economic interdependence, see (Gartzke & Lupu, Spring 2012) Note that this latter perspective is not actually incompatible with the dissertation's argument, however, because my contention is not that the interdependence mechanism *failed* but rather that it was *overwhelmed* by a countervailing process.

VII. 1945-1989: A Hard Case?
Economic Openness, East-West Power Differentials, and Cold War Tensions

The final empirical chapter of this dissertation considers a harder case for integration-convergence theory: the era of the Cold War, approximately defined by the period between 1945 and 1989. If 1581 to 1648 represented the first 'modern' era of trade, financial flows, and technology diffusion,[1] and 1870-1914 was the 'first wave' of true globalization,[2] 1950-73 can be seen as the 'Golden Age' of capitalist growth.[3] Moreover, in the wake of the two 1970s energy crises (1973 and 1979), the subsequent decade – 1980-89 – was also marked by dynamic global economic expansion. Indeed, as figure 1 makes clear, 1950-73 was characterised by the highest average annual global GDP growth of the second millennium.[4] The subsequent period, from 1973 into the 1990s – while marking a slowdown in the rate of economic expansion from the Golden Age – was also a period of robust GDP growth.

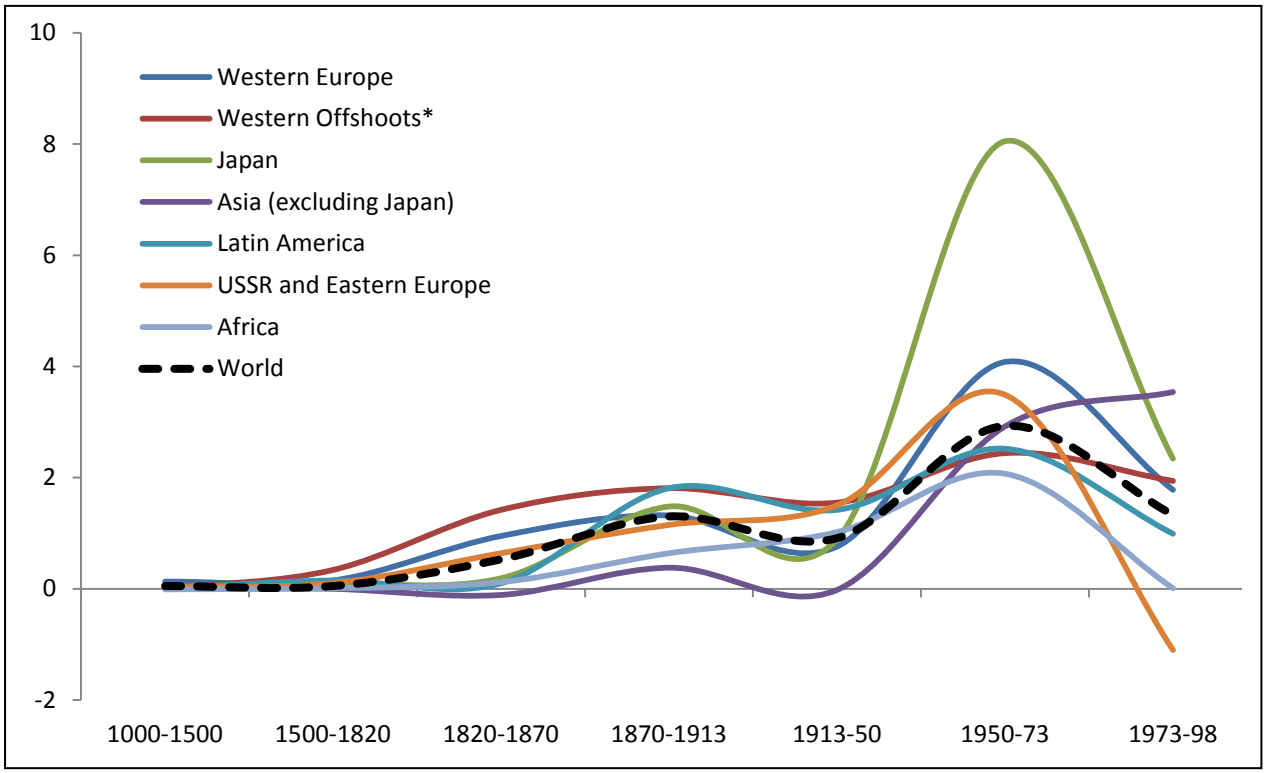
Moreover, as I shall progress to show, the catch-up growth enabled by a deepening of economic openness in this period was a key driver of differentials in economic dynamism throughout the Cold War. If 1870-1913 was the first great wave of globalization, and the 1914-45 period one of relative economic closure, then 1950-73 was the era of economic re-integration – and this had an important impact on relative economic performance, and thus states' relative material power base.

Notably, however, the Cold War – for all of its tensions and crises – did not ultimately descend into outright 'hot' war between the major powers. Indeed, with hindsight, it can be argued that the Cold War was a comparatively stable period of international politics[5] – although such a perspective requires taking a comparatively sanguine view of the escalatory

[1] (de Vries & van der Woude, 1997)
[2] (O'Rourke & Williamson, 1999)
[3] (Crafts & Toniolo, 1996; Maddison, 1991) Drawing parallels between 1870-1914 and 1945-89, see (Bordo, January 2002, p. 21)
[4] (Maddison, 2003a) On globalization in the early Cold War specifically, see (Clark, 1997, pp. 122-147)
[5] (Mearsheimer, August 1990)

risks that Cold War crises and proxy wars brought with them, and of the severity of such proxy wars. As such, on the simplest possible measure of congruence – between deepening global economic integration and major power war – the Cold War appears to present a puzzle for the dissertation's theory.

Figure 1. World per Capita GDP Growth by Region in the Second Millennium, %



Source: Maddison (2003). Percentage growth figure is the average annual compound rate in each epoch. *USA, Canada, Australia, and New Zealand.

The purpose of this chapter is therefore both different from and the same as that of the earlier two case studies. It is the same, in that all three case chapters form part of a qualitative test of the theory's explanatory power. But it is different in that – at least on face value – it represents a negative case; that is, an instance of the independent variable shifting but the dependent variable remaining apparently unchanged. Put colloquially, it looks at first blush

like a case of 'the dog that didn't bark.' Accordingly, exploring the case here serves three principal purposes. First, it allows us to consider whether the case represents a falsifier for the theory.[6] Second, it allows us to consider – if indeed the case is not an outright falsifier – to what extent it still presents a problem for the theory. Third, and following from the previous point, if the theory is not falsified but is nevertheless challenged by the case, it allows us to investigate the theory's limitations, boundary conditions, scope constraints, and the role of intervening variables in the causal pathway. Of course, a full investigation of the role and importance of intervening variables would be a valuable future study in itself; as noted throughout, the purpose of this study has been to test whether the purported causal mechanism does operate, rather than to establish the precise conditionality that circumscribes the theoretical pathway. Nonetheless, exploring such intervening factors is still valuable within the confines of a case, so as to shed light on their potential impact and highlight them as areas for future research.

The chapter follows an amended and augmented version of the same structure as the other cases, reflecting its similar role but different emphasis. First, it presents evidence of deepening of economic integration along all three of the theory's major metrics – trade, financial flows, and technology diffusion – during the 1945-89 period, while also pointing out key cross-national differences in the level of integration obtained.[7] Clearly, among the major economies of the latter half of the twentieth century, the Soviet Union stands out as comparatively closed off from economic exchange with other major economies. Second, it considers the impact of that integration on economic growth differentials in the major

[6] On the significance of falsification, see (King et al., 1994, pp. 99-114)

[7] Note that some of the different data sources used appear, at times, slightly inconsistent with each other. In some places, this is due to different metrics being used (for example, the Maddison (2003) uses a 1990 US$ purchasing power parity (PPP) while most of the World Bank data uses then-year current US$); at other times, there may indeed be modest measurement discrepancies at work. For the purposes of the broad-brush picture that the chapter is seeking to paint, however, these minor discrepancies do not represent a major problem. In addition, in some charts, Russia appears in the legend but a Russia curve does not appear on the chart. This is a result of Russia featuring in the extracted data series but there not being actual Russian data for the years in question, and should therefore be ignored.

powers, identifying sites of convergence to and divergence from productivity and subsequent output levels in the most advanced start-of-period lead economy, the United States. Key differences between the pre- and post-1973 world economies are also pointed out at this stage. Next, it turns to a discussion of the impact of growth differentials on the material power base of the major economies over the course of the Cold War. Finally, it considers the extent to which observed power shifts may have interacted with shifts in major states' security relations during the Cold War period, and to what extent the observed outcomes are or are not consistent with the dissertation's overall theoretical argument.

I conclude that the 1945-89 case represents a challenge for integration-convergence conflict theory that highlights important scope conditions, but that it does not represent a serious problem for my argument – and it is certainly not an outright falsifier on either of the metrics described at the end of Chapter IV. Rather, the chapter demonstrates that in terms of micro-level causal mechanisms, the evidence from the Cold War case is broadly consistent with the theory. Deepening economic integration caused catch-up growth by less developed follower economies during this period, and the result was a shift in the balance of power. In terms of relations between the Western major powers, however, none of the follower powers that experienced catch-up growth – Japan, West Germany, France, and the United Kingdom – had the population prerequisites to constitute a true peer competitor to the start-of-period lead economy, the United States; thus, while there was economic convergence, the associated power shift was not large enough to significantly impact overall systemic stability. Moreover, the Western powers were united by balancing the Soviet Union – the only potential peer competitor to the United States, and the overwhelmingly salient regional geopolitical threat to

Western Europe and (to a more qualified extent) Japan – removing their incentive to compete with each other.[8]

In terms of relations at the global great power level, meanwhile – that is, between the Western powers and the Soviet Union – the pattern is again at least partially consistent with the theory. In the immediate post-World War II era, the Soviet Union experienced rapid growth – and a significant contributor to this was Western capital and technology transfer prior to and especially during the war itself. However, the subsequent comparative closure to economic exchange with the other major powers – the Soviet Union traded, to be sure, but predominantly with its own minor power communist satellites – resulted in economic atrophy and, by the 1970s and especially the 1980s, severe relative economic decline. This is instructive in terms of viewing this as a negative case: the one great power that shut itself out of the wider international system of deepening economic exchange that the others were participating in was also the one that did not reap the productivity benefits of diffusion, just as the theory would expect. In other words, the same catch-up growth towards US productivity and subsequently development levels experienced by Japan, West Germany, France, and the United Kingdom detailed above also resulted in these same second-tier Western powers pulling further away from the Soviet Union in terms of development, thus widening the overall economic power gap between the North Atlantic Treaty Organisation (NATO) and the Soviet bloc.

Of course, the Cold War never turned into an outright 'hot' war of direct combat between the regular forces of the major powers. For this, nuclear deterrence takes much credit – viewed in terms of the offence-defence balance, the major powers of the Cold War were armed (at least after the early stages) with weapons of such limited utility for conquest but

[8] Japan, due to its location, was of course principally concerned by the Cold War's Asian manifestations – tensions on the Korean Peninsula, the shifting stance of China, and so forth. Insofar as the Soviet Union was a key component of such tensions, it seems fair to judge Soviet power as a key East Asian regional security threat, even if there was not the same imminent risk of a full-scale Soviet ground invasion as that faced by West Germany and its European allies.

such overwhelming retaliatory power that an outright conventional military offensive never made sense for either party.[9] Such a technologically-contingent intervening variable – along with such factors as the concerned states' geographical relationship and the ideological dimension of Cold War tensions – clearly falls beyond the scope of the theory, and goes some way towards providing explanatory boundaries to the overall argument.

Nonetheless, however, the military crises and tensions that *did* characterise the Cold War – including such proxy wars as Korea (1950-53), which was a major war on any definition – were more severe during times of differential power shifts: the early days, when the Soviet Union was still experiencing healthy economic growth, and the last decade, when the Soviet Union's economic closure and rigidity had sent it into serious relative decline. In both instances – increasing Soviet boldness coupled to mounting Western fear in the 'first' Cold War, and increasing Western boldness (most notably, the Reagan military build-up) coupled to mounting Soviet fears in the 'second' – dynamic differentials in the growth of the economic base explain much of the observed political-military outcome.[10] The intervening period of détente, by contrast, corresponded with a cessation of the Soviet Union's relative rise but occurred before it had gone into terminal decline; in other words, the most stable and (comparatively) cooperative period of the Cold War occurred when the dynamic power growth differentials were at their most limited. The point of the chapter is not to conduct an in-depth analysis of the extent to which relative power shifts contributed to shifts in Cold War tensions; that would be a substantial research project in itself. However, it *does* demonstrate that variation in the Soviet Union's economic engagement with the other major powers contributed to its relative rise and subsequent decline – just as steadily deepening integration contributed to the relative rise of the non-US Western powers – and the

[9] (Glaser & Kaufmann, Spring 1998; Jervis, 1989)

[10] Decision-makers' cognitive framing of such crises in terms of not wanting to repeat the mistakes of appeasing a rising power in the 1930s probably gave the security tensions arising from such power shifts a particularly confrontational edge. On the role of such cognitive framing and analogous reasoning about the 'Lessons of Munich' in the exacerbation of such Cold War crises, see (Khong, 1992, pp. 174-207)

correlation between these economic shifts and the shifts in the tenor of Soviet-Western political-military relations over the full course of the Cold War is clearly worthy of note.

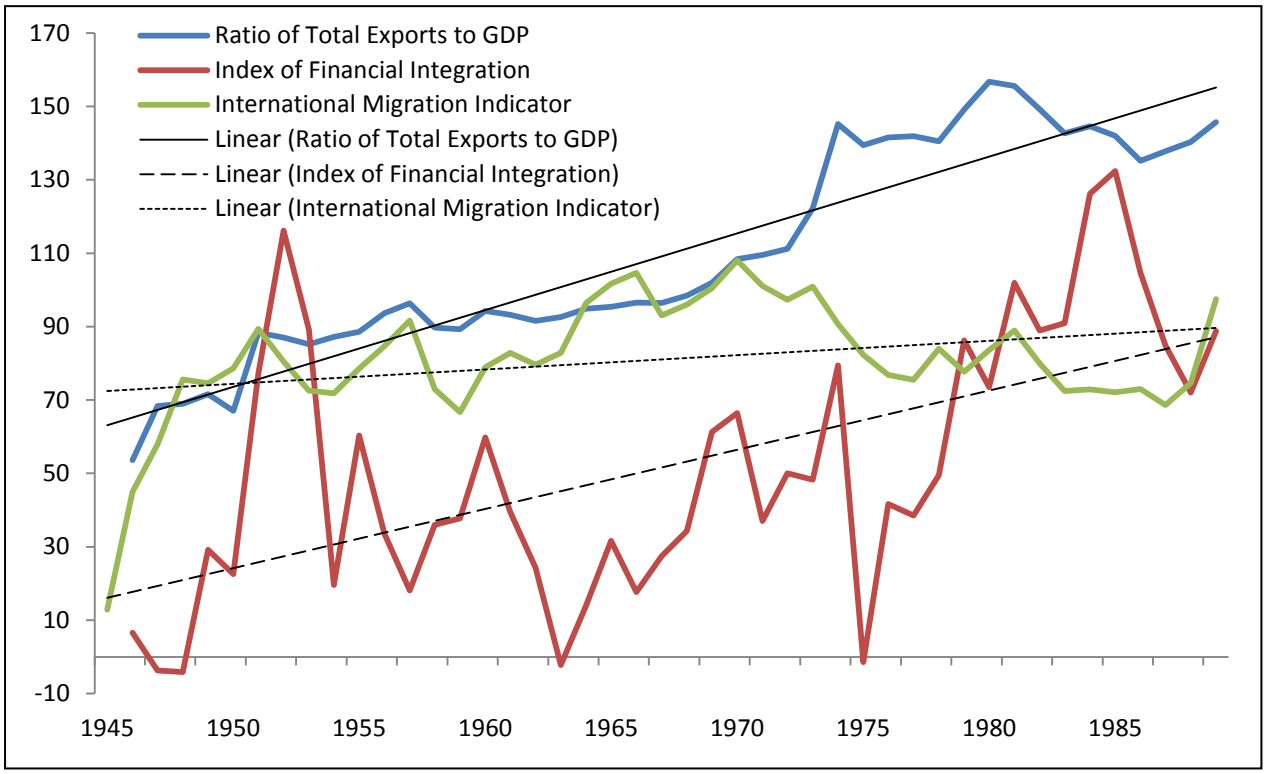
Economic Integration during the Cold War

As several charts in this dissertation that look at trade, financial flows, and labour and technology movement over the long cycle of history make clear, on every measure of international economic exchange, the years between 1914 and 1945 were a period of comparative closure. There were two significant intra-period upticks, to be sure, but taken as a whole, this three-decade window – characterised as it was by two devastating pan-systemic wars – was an epoch of international fragmentation and a low point for the modern era of cross-border economic integration.[11] In the peace that followed 1945, therefore, deepening international economic (re-)integration offered the prospect of significant commercial benefits.

Did such economic re-integration occur? Figure 2, which presents aggregate data on the overall size of cross-border flows of goods and services, capital, and people within the global economy, demonstrates that it did.[12] A 1945-89 excerpt of the longer dated (1880-1996) chart presented in Chapter VI, the linear progression displayed by all three curves in figure 2 – for trade, financial interconnectedness, and labour movement – makes clear that, intra-period cycles notwithstanding, international economic integration deepened throughout the Cold War. Note too that this chart makes clear the timing of the different dimensions of economic openness returning to their 1900 levels (1900 representing the 100 index of all three curves). Below, I turn to a more detailed analysis of this aggregate picture, considering trade, financial flows, and labour and technology diffusion in turn.

[11] (Bordo, January 2002, p. 21; Clark, 1997, pp. 52-121)
[12] (Flandreau et al., 2010, p. 100)

Figure 2. Three Measures of International Economic Openness, indexed 1900=100



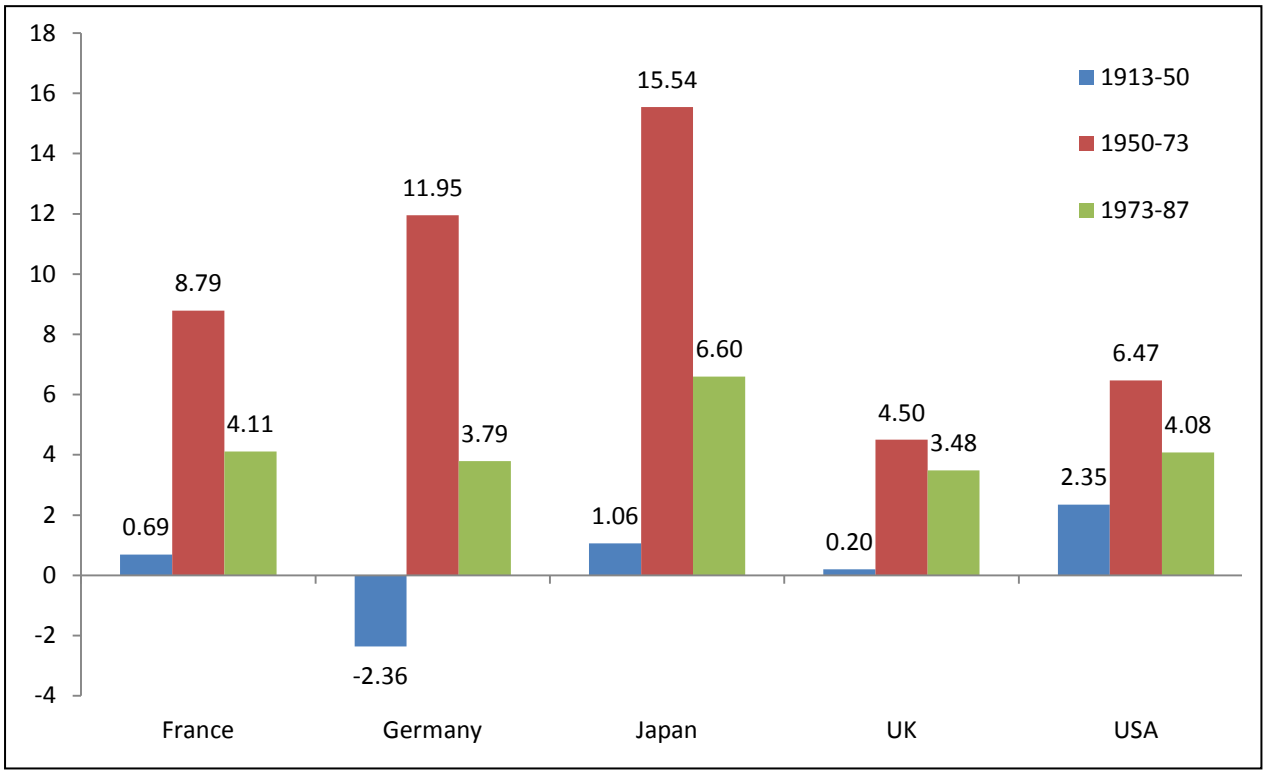
Source: Flandreau, Flores, Jobst, and Khoudour-Casteras (2010), Figure 4.3 (p. 100). I thank Marc Flandreau and Clemens Jobst for generously sharing their data with me. Note here that financial integration is measured using Feldstein-Horioka estimators of current account disconnectedness, while labour market integration is measured by dividing migratory turnover by population; the trade openness metric is self-explanatory.

Trade

Figure 3 presents data on the growth of the foreign trade of the United States, Japan, Germany, France, and the United Kingdom; that is, the five principal powers of the Cold War era that were also part of the liberal international economic order.[13] The chart shows us three things. First, as noted above, 1913-50 was – in comparison to subsequent decades – a period of relative economic closure, as trade grew by negligible amounts, if at all. Second, the 1950-87 period was – in comparison to the preceding 37-year window – a period of rapid expansion in the volume of the G5 powers' foreign trade. And third, within that dynamic 1950-87 period, the first half – the 1950-73 'Golden Age,' prior to the first oil shock – was marked by a particularly impressive expansion of trade volumes, before the pace of growth cooled thereafter.

[13] (Maddison, 1991, p. 148)

Figure 3. Growth in Volume of G5 Foreign Trade, 1913-87, %



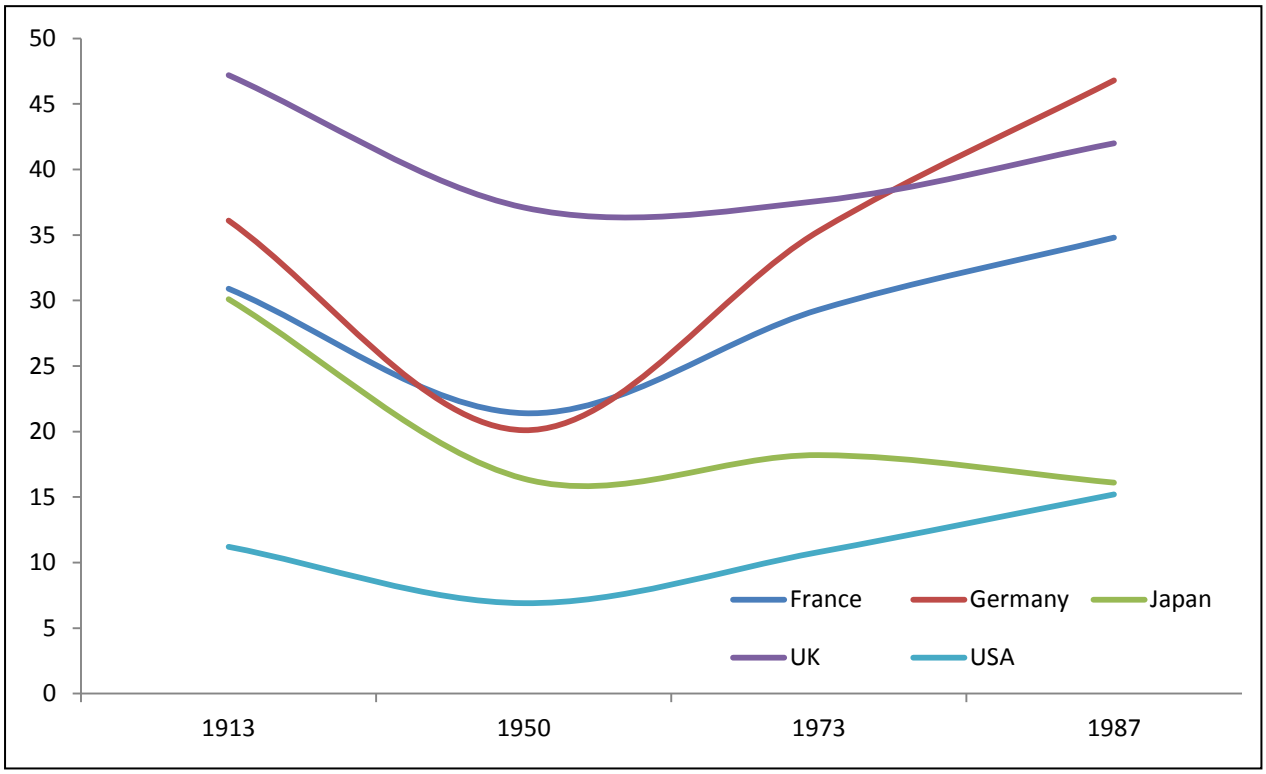
Source: Maddison (1991), p. 148. Percentage growth figure is the average annual compound rate in each epoch.

Figure 4 builds on this picture by demonstrating that not only was the Cold War a period of significant trade volume growth for the G5, but also that it was a period of commodity trade growth as a proportion of G5 GDP.[14] Again, the pattern of closure in the 1913-50 period compared to what went before and after, re-opening in the 1950-87 period, and particularly rapid re-opening during the pre-1974 half of 1950-87 is visible across all five major Western economies – although so too are their comparative differences in the share of trade within each of their national economic models. Figure 5 presents similar data over a shorter time horizon, also bringing in China and – for the 1989-91 period, as the Soviet Union collapsed – Russia.[15]

Moving from trade in general to exports specifically, there is again evidence of an expansion of economic exchange and deepening post-war re-integration in the Cold War period. As figure 6 makes clear, in comparison to what went before and after, 1913-50 was a

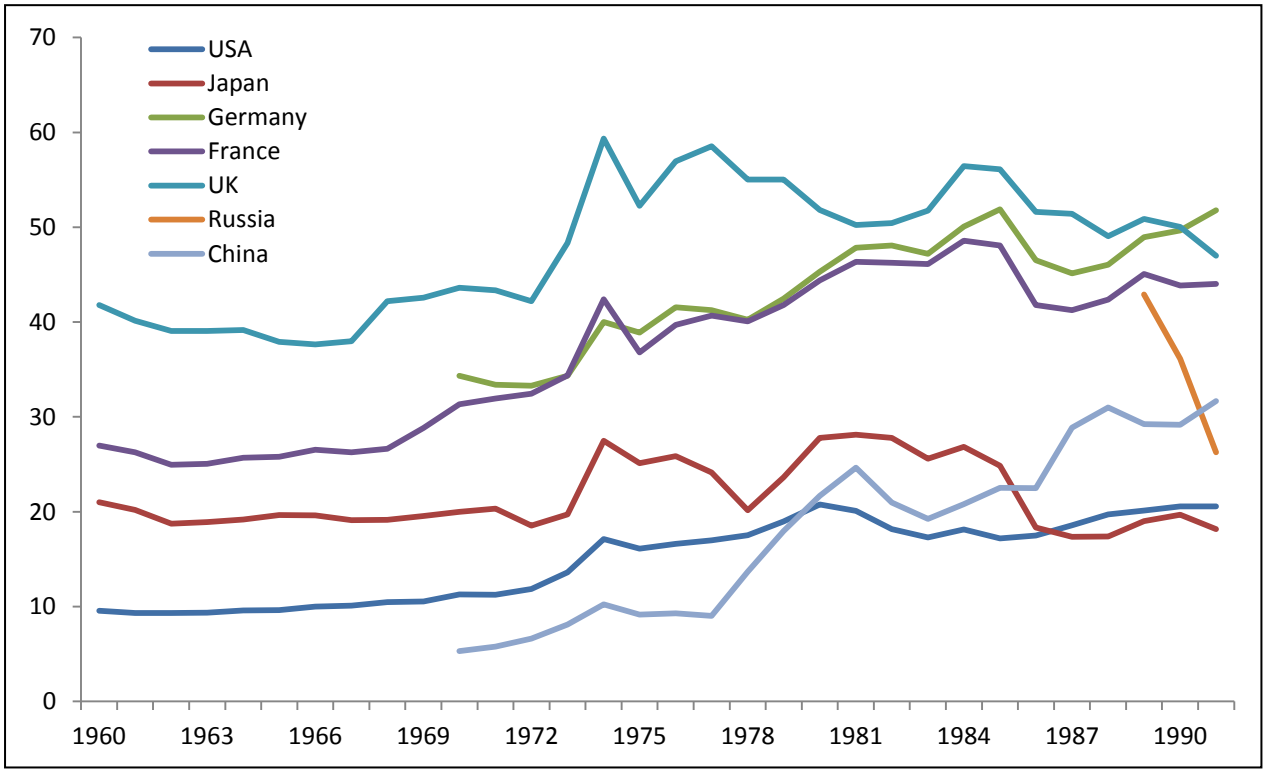
[14] (Maddison, 1991, p. 149)
[15] (Bank, 2012)

Figure 4. Ratio of Trade to GDP in the G5, 1913-87, %



Source: Maddison (1991), p. 149. Figure is the ratio of commodity exports plus imports to GDP at then-year market prices.

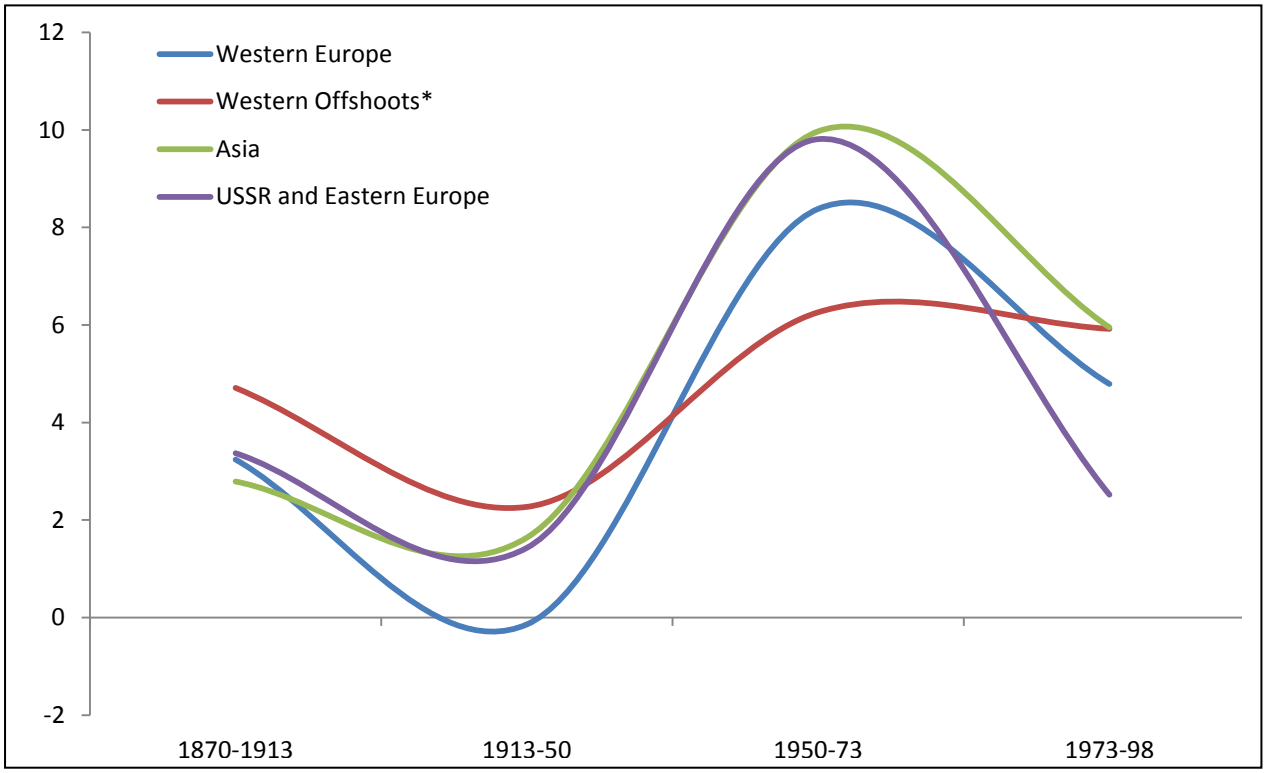
Figure 5. Ratio of Trade to GDP in the Major Powers, 1960-91, %



Source: World Bank World Development Indicators and Global Development Finance (2012); data accessed online on 23 July 2012 at http://databank.worldbank.org/ddp/home.do. Figure is the ratio of total exports plus imports to GDP at then-year market prices.

comparative low point for all of the major economic regions' merchandise export volume growth, but the subsequent 48 years – particularly capitalism's Golden Age, between 1950 and 1973 – was one of remarkable export growth.[16] Again, figure 7 displays a similar but more detailed country-specific pattern for the major powers between 1961 and 1991 (the curve begins in 1966, but uses a five-year rolling average, hence the lag).[17] As can be clearly seen, export growth was strong throughout the post-1960 Cold War, notwithstanding the fact that using a five-year rolling average inevitably smoothes-out non-trivial intra-period cyclical shifts, but was particularly strong prior to the 1973 oil shock and in certain countries (most notably Japan, France, and the United States).

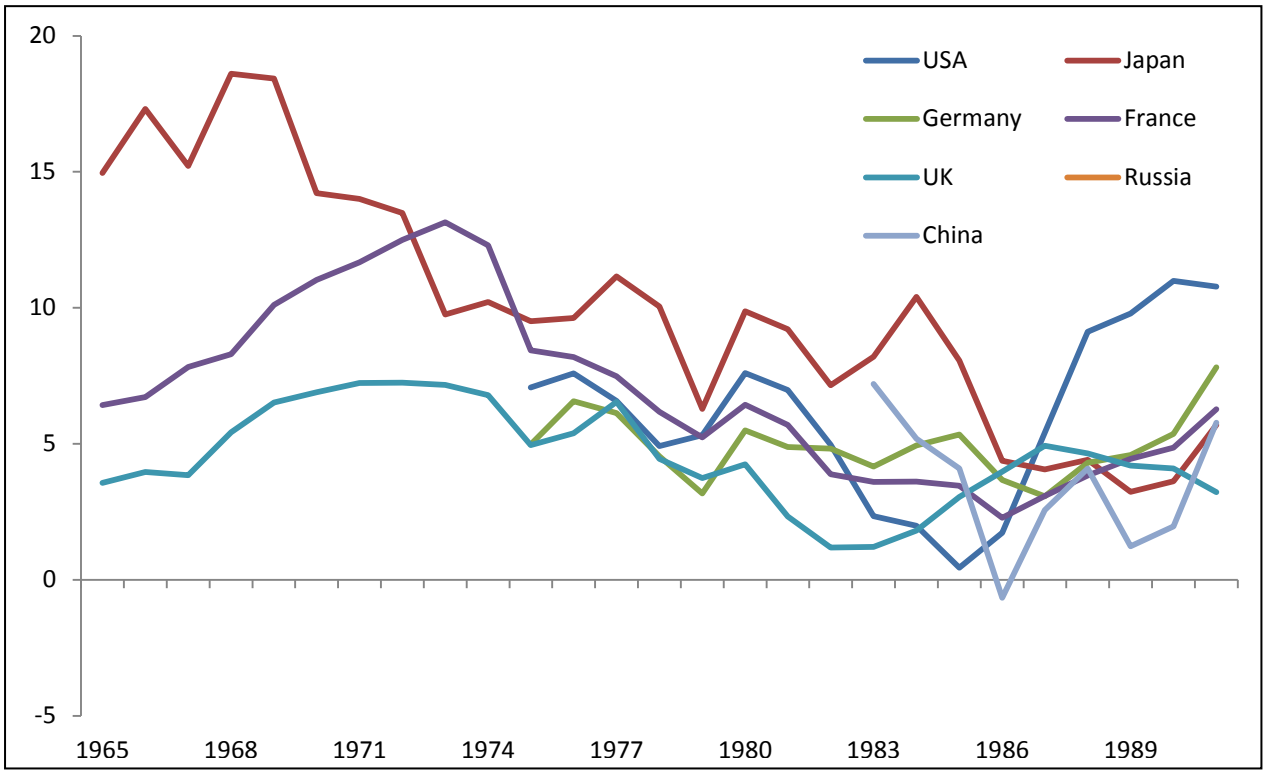
Figure 6. Growth in the Volume of Major Regions' Merchandise Exports, 1870-1998, %



Source: Maddison (2003). *'Western Offshoots' here means the United States, Canada, Australia, and New Zealand. Percentage growth figure is the average annual compound rate in each epoch.

[16] (Maddison, 2003b)
[17] World (Bank, 2012)

Figure 7. Export Growth in the Major Powers, 1965-91, %



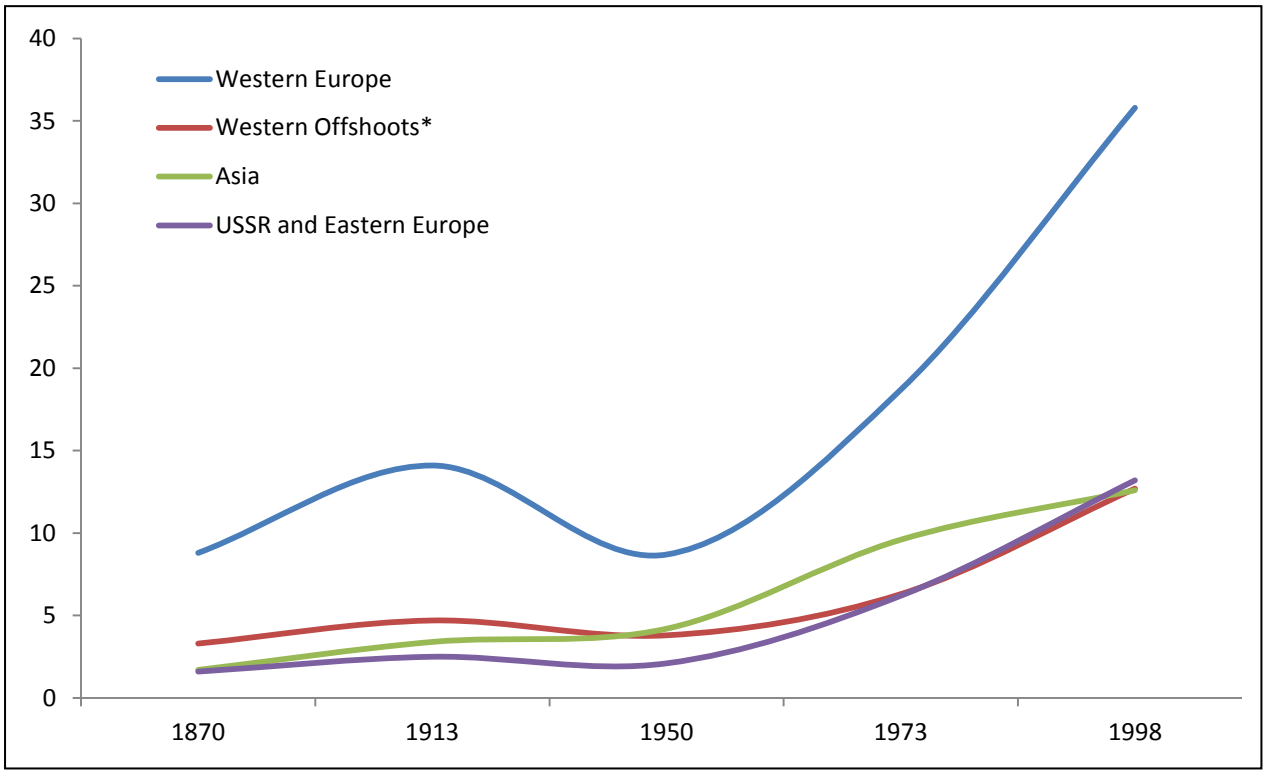
Source: World Bank World Development Indicators and Global Development Finance (2012). Growth figure is a five-year rolling average (to smooth annual volatility) of the annual compound percentage rate.

Did the share of exports in GDP mirror the growth seen in export volume during this same period? Figure 8 suggests that it did.[18] As the direct corollary to figure 6, taking in the same period and regions, the 1913-50 internal economic closure is again visible, as is the post-1950 re-opening. Accordingly, it is clear that exports did not simply grow in line with the domestic economy, but rather – just as figures 4 and 5 suggested – that the expansion of trade went beyond GDP growth to result in an international economy characterised by a greater overall proportion of goods exchange. Figure 9, the equivalent corollary to figure 7, further supports this picture.[19]

Turning to what these proportions mean for the overall scale of exports in cash terms, figure 10 provides current (then-year) US dollar data on the value of the major powers' total goods and service exports over the 1960-91 period (again, Russia only enters the World Bank

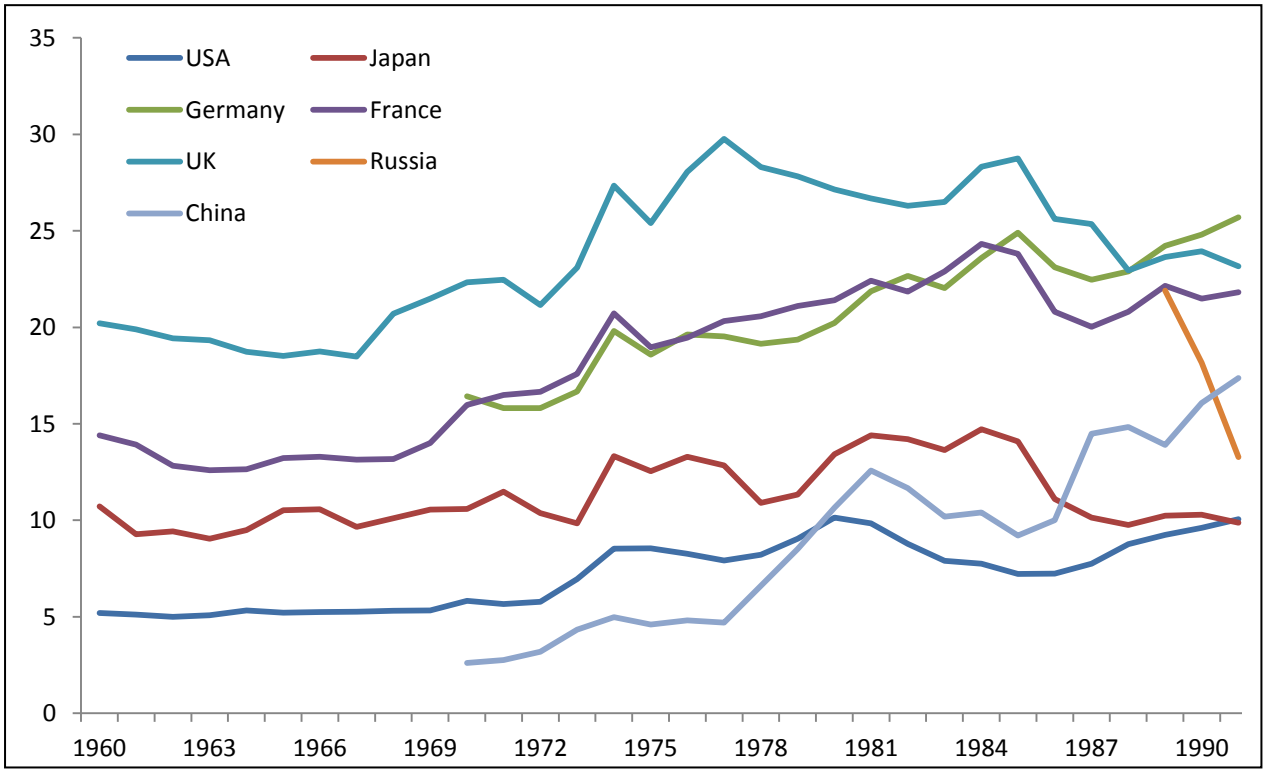
[18] (Maddison, 2003b)
[19] (Bank, 2012)

Figure 8. Merchandise Exports of the Major Regions, 1870-1998, % of GDP



Source: Maddison (2003). *'Western Offshoots' here means the United States, Canada, Australia, and New Zealand. Figure is the ratio of total exports plus imports to GDP at then-year market prices.

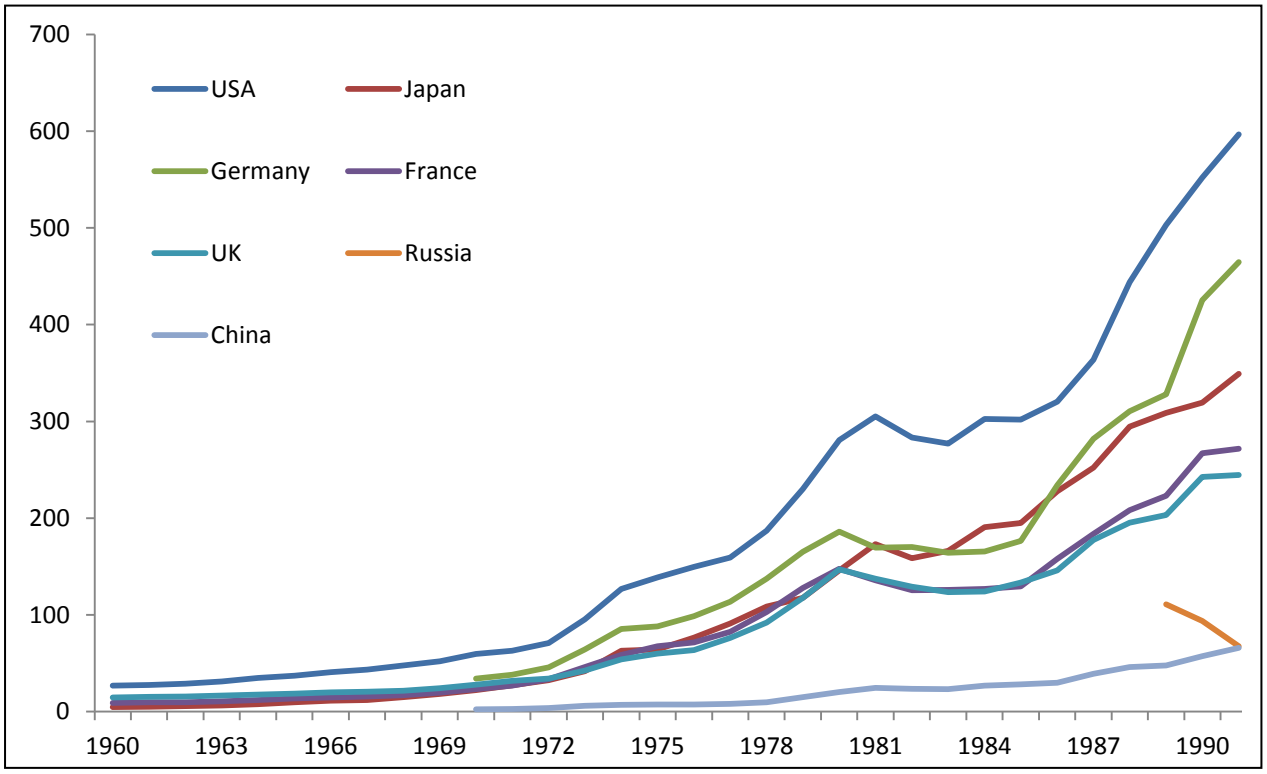
Figure 9. Exports of Goods and Services of the Major Powers, 1960-91, % of GDP



Source: World Bank World Development Indicators and Global Development Finance (2012). Figure is the ratio of total exports plus imports to GDP at then-year market prices.

data in 1989, providing a sense of its position at the end of the Cold War but unfortunately not charting the Soviet data from prior to that).[20] A number of patterns and events are visible in this data: the recessions that followed the two oil shocks, the termination of the Bretton Woods exchange rate system, the West's economic boom of the late 1980s, the comparative weakness of the Soviet economy in international markets by the end of the Cold War, and the United States' role as the largest overall exporter in the international system in absolute terms. Returning to this dissertation's theory, and the central role that diffusion of capital and technology from the start-of-period lead economy plays in catch-up convergence growth, the overall scale of US goods and services exports is particularly significant.

Figure 10. Goods and Service Exports of the Major Powers, 1960-91, then-year US$ billion



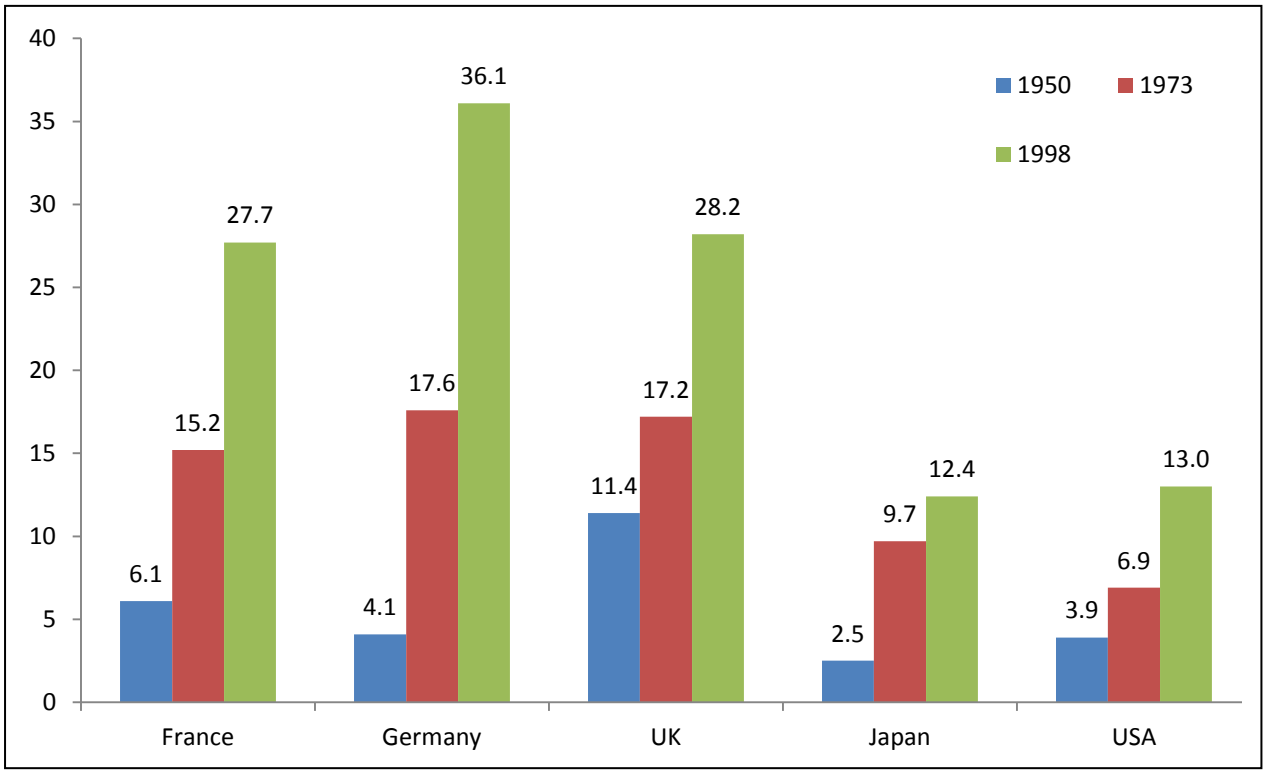
Source: World Bank World Development Indicators and Global Development Finance (2012).

Turning from exports to the other half of the overall trade picture, did import growth outstrip that which would be expected simply as a product of GDP growth? Figure 11

[20] (Bank, 2012)

suggests that it did. As can be clearly seen, the size of imports as a proportion of GDP increased steadily from 1950 to the 1990s throughout the G5 – and in the 1950-73 period, this growth was more pronounced in the four principal Western follower economies than the United States.[21] Again, from a catch-up convergence perspective, the greater share of imports in the Western follower economies than the Western leader is significant.

Figure 11. Imports of Goods and Services in the G5, 1950-98, % of GDP



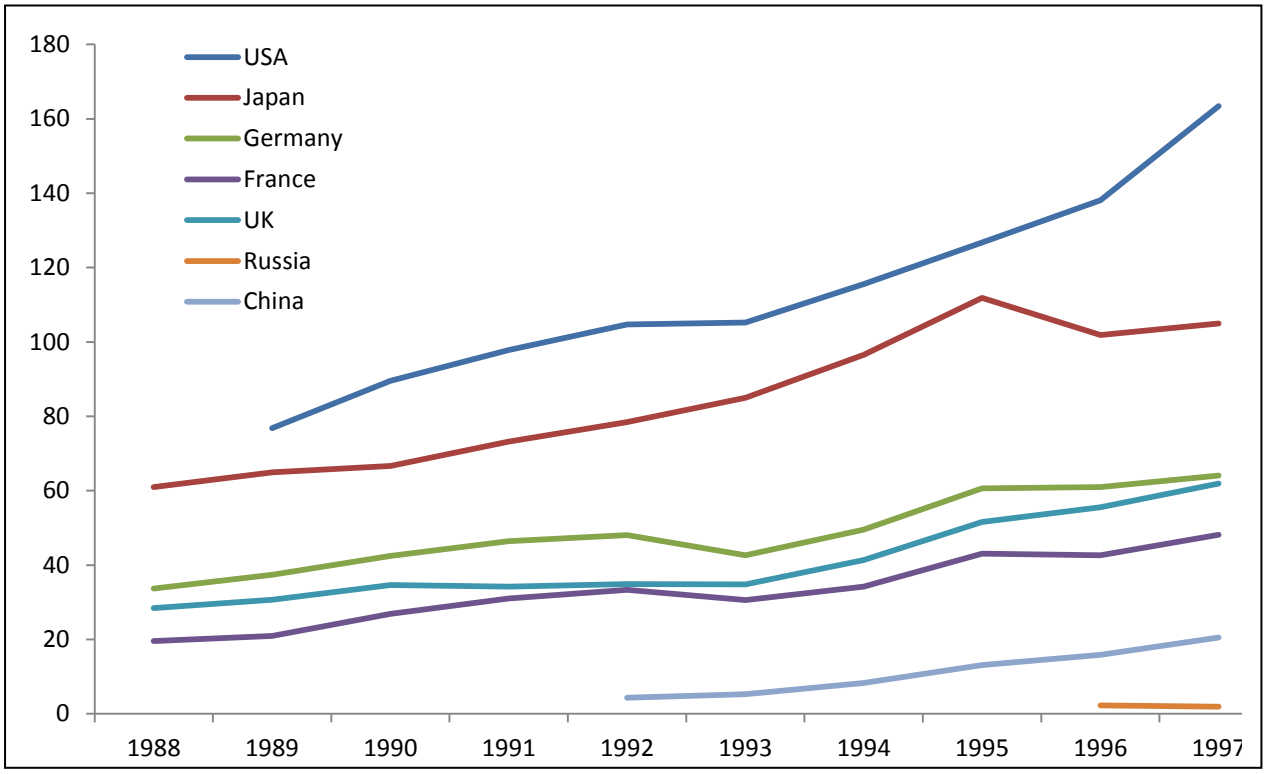
Source: Maddison (2003).

Figures 3 to 11 covered the expansion of foreign trade in the aggregate. Figures 12 and 13, by contrast, look at specific dimensions of the expansion of foreign trade that are significant for explaining the observed catch-up growth detailed later in the chapter.[22] Figure 12 shows the value of the major powers' high-tech goods (using the World Bank's definition of R&D intensity) exports.[23] Unfortunately, this data series only begins in 1988, meaning that

[21] (Maddison, 2003b)
[22] (Bank, 2012)
[23] (Bank, 2012)

it only provides a snapshot of the very end of the Cold War and the years in its immediate aftermath. Nonetheless, insofar as such a snapshot can still at least give us an understanding of high-tech goods flows at a single point in time, the evidence that this chart provides – particularly the United States' lead (which is also reflected in proportional terms, as a share of manufactured exports) – is consistent with a story of the lead economy as a source of technology diffusion to follower economies.

Figure 12. Major Powers' High-Tech Exports, 1988-97, then-year US$ billion

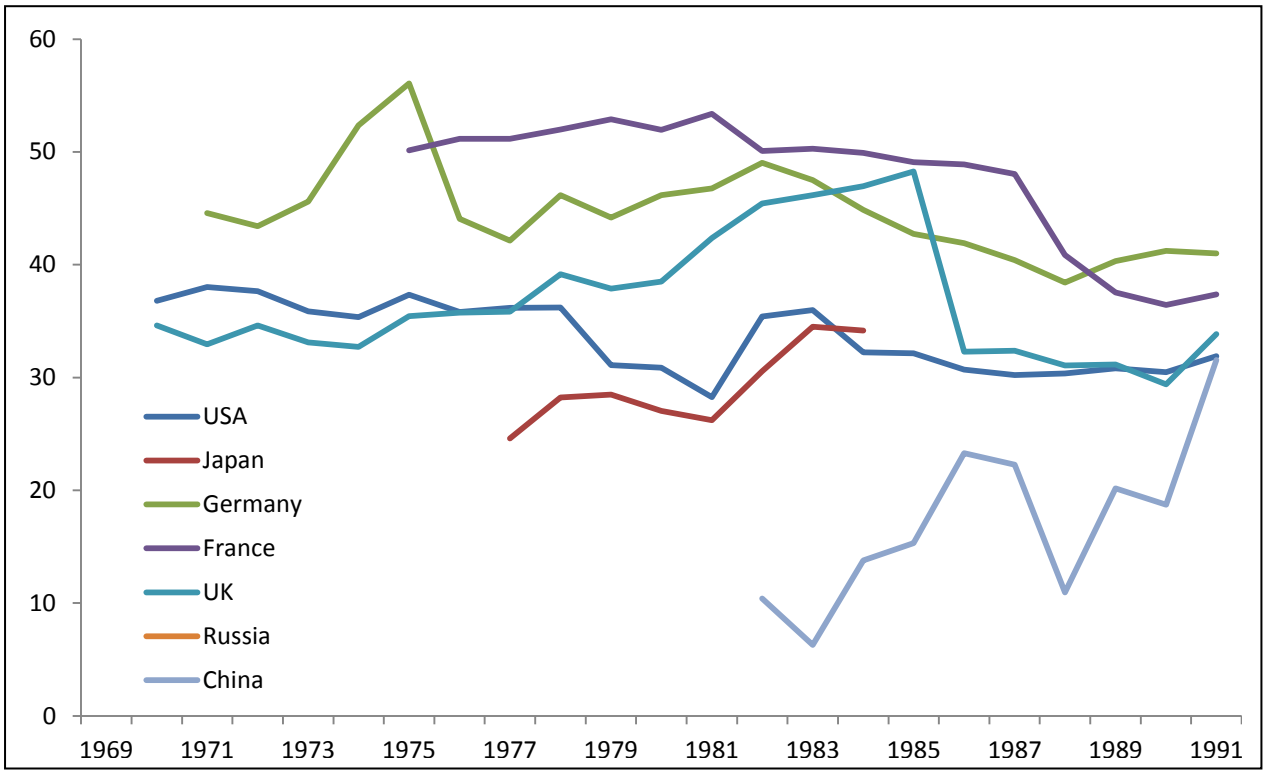


Source: World Bank World Development Indicators and Global Development Finance (2012).

Moving away from the trade solely in goods, figure 13 provides data on computing and communication services – a key area for technology and information diffusion – as a share of total commercial services exports. As the chart makes clear, such exports were larger

proportionally in the three principal European states, but still larger in absolute terms – given the scale of overall commercial service exports – in the United States.[24]

Figure 13. Computing and Communications Service Exports, 1970-91, %



Source: World Bank World Development Indicators and Global Development Finance (2012). Figure is as a proportion of total commercial service exports.

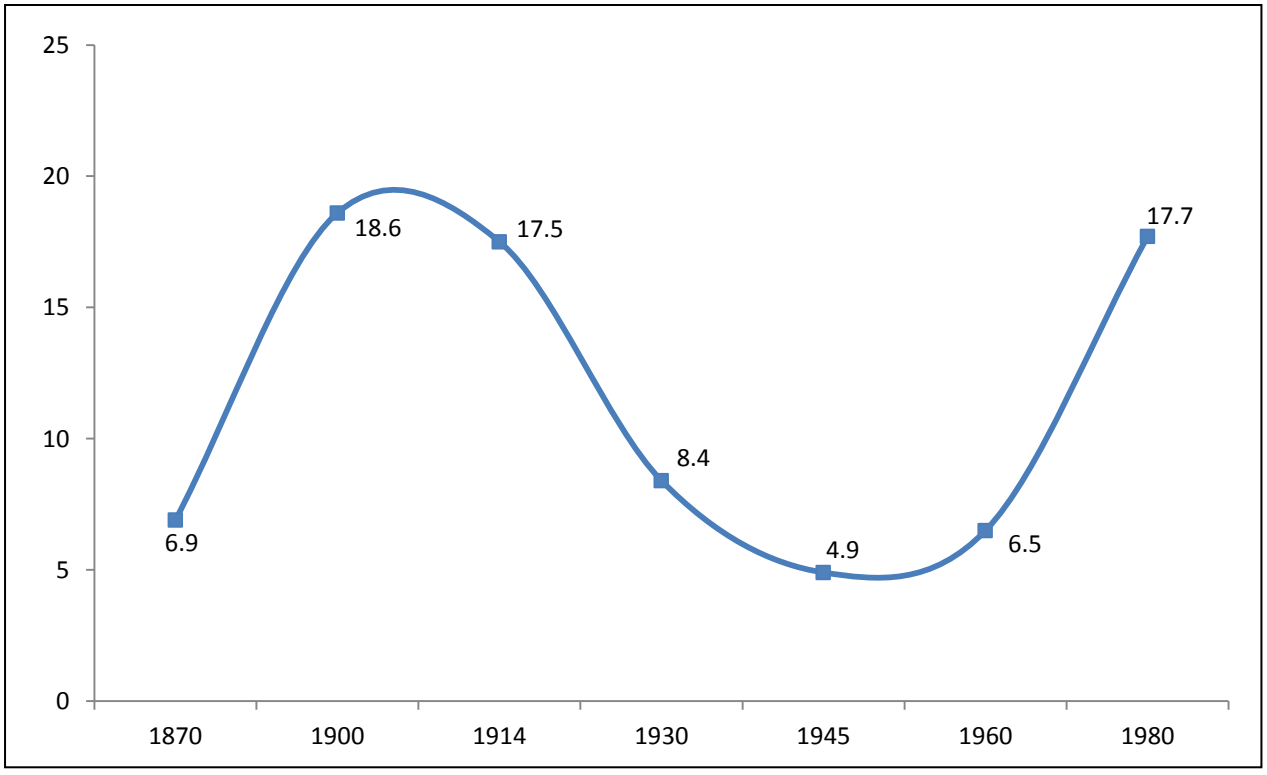
In short, there is abundant evidence that international trade in goods and services – a key dimension of international economic integration – expanded in overall terms during the Cold War. However, this expansion was predominantly concentrated within the Western world; the share of intra-OECD exports within total exports increased throughout the period.[25]

[24] (Bank, 2012)
[25] (Bank, 2012)

Financial Flows

Moving from the international flow of goods and services to the international flow of financial capital, the Cold War again stands out as a case of deepening economic (re-)integration. Partly, this owed to a conscious US effort to invest in European recovery, via the Marshall Plan; however, it also had a non-planned, market-based component, and expanded further even after Marshall Plan funding expired in 1952.[26] As figure 14 makes clear, the expansion of world foreign assets as a proportion of global GDP from 1945 to 1980 – and certainly in the twenty years following 1960 – closely mirrors the expansion of such cross-border investment seen between 1870 and 1900, during the 'first wave' of globalization, and by 1980, had just surpassed the level seen on the outbreak of war in 1914.[27]

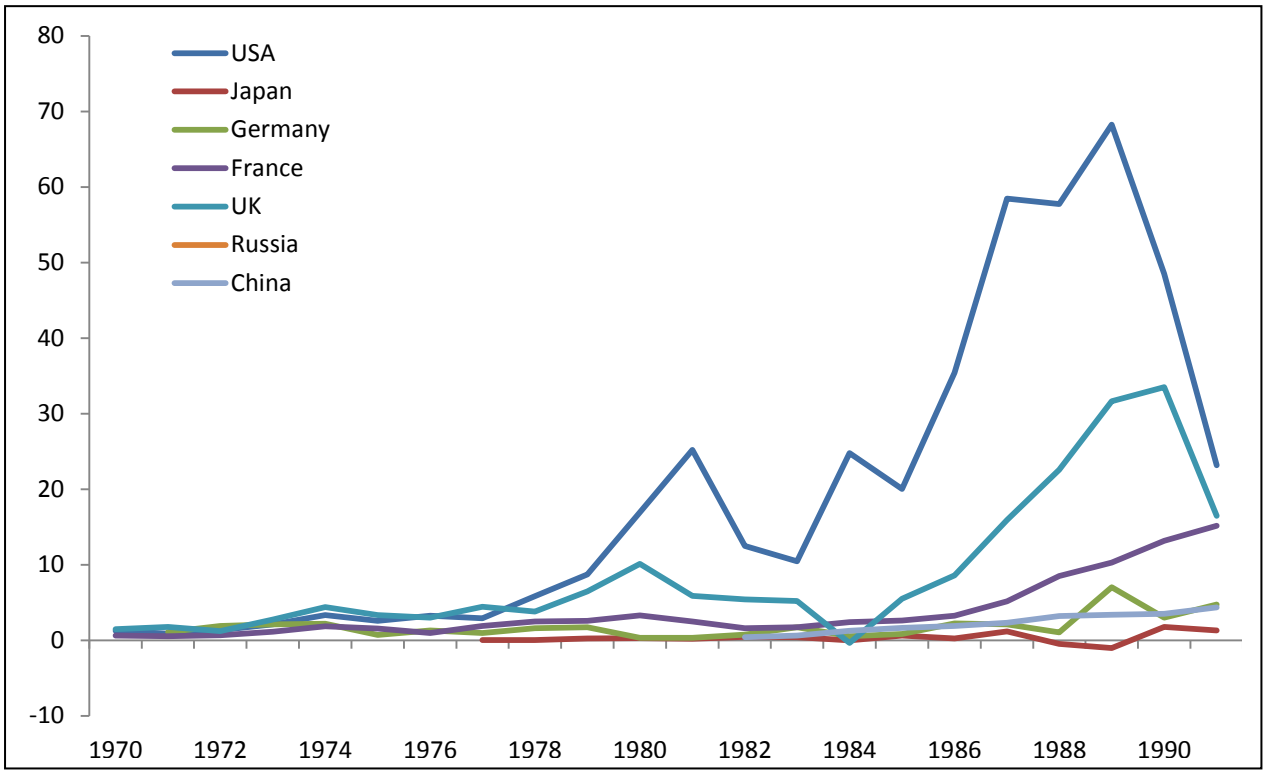
Figure 14. Foreign Assets as a Proportion of World GDP, 1870-1980, %



Source: Crafts (2000), p. 27 (Table 23A).

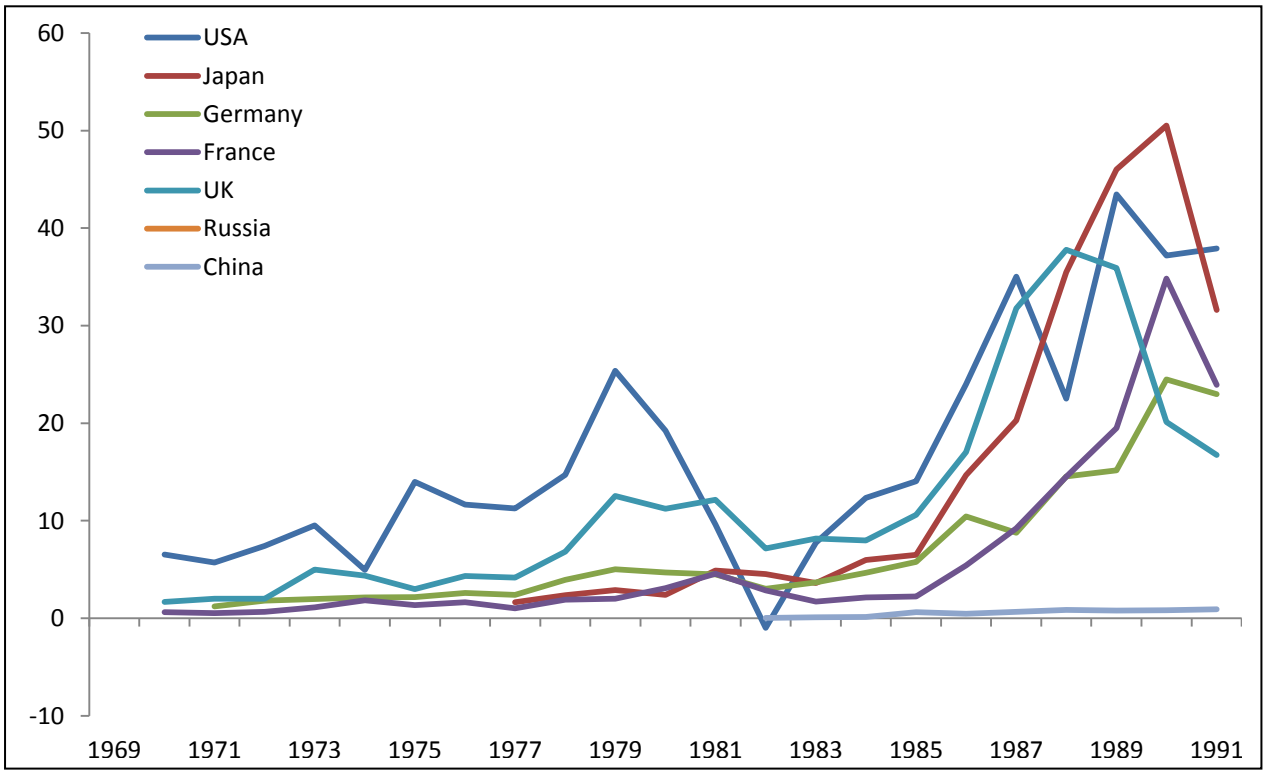
[26] (Eichengreen, 2008; Hogan, 1989)
[27] (Crafts, March 2000, p. 27)

Figure 15. Major Powers' FDI Net Inflows, 1970-91, then-year US$ billion



Source: World Bank World Development Indicators and Global Development Finance (2012).

Figure 16. Major Powers' FDI Net Outflows, 1970-91, then-year US$ billion



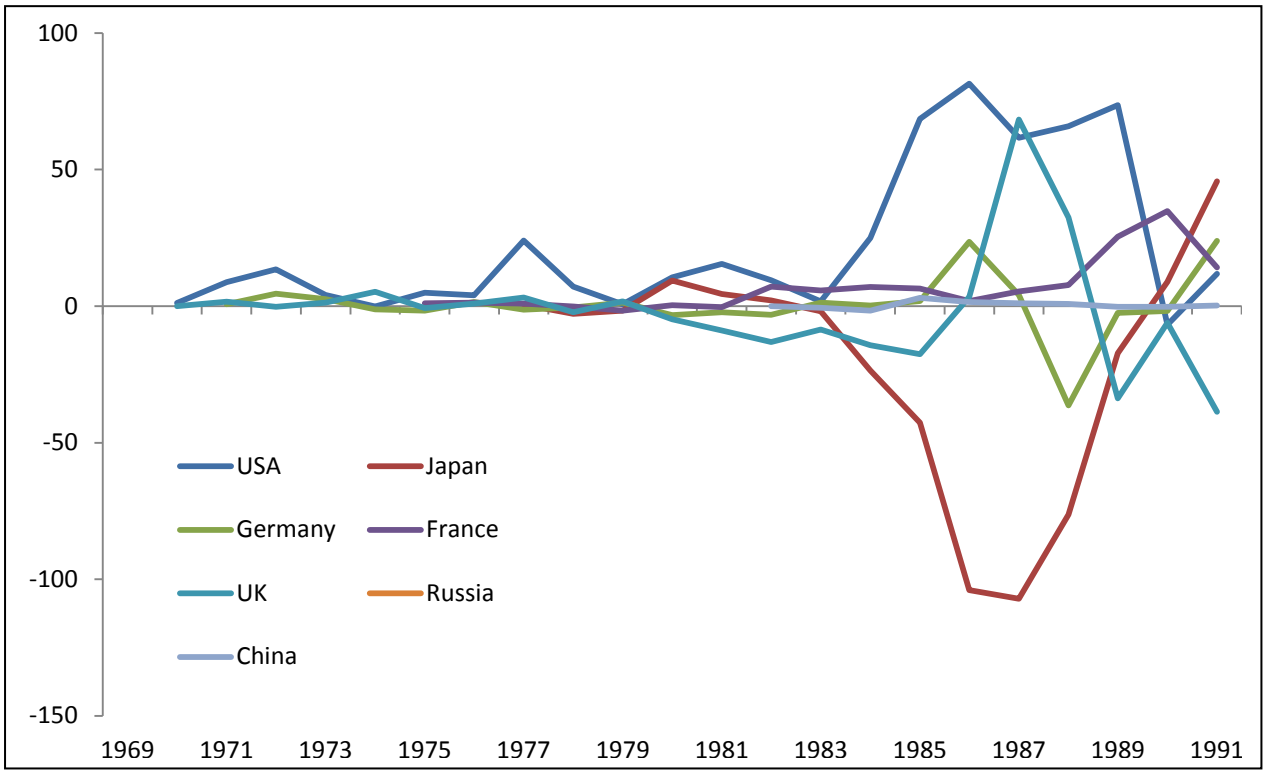
Source: World Bank World Development Indicators and Global Development Finance (2012).

Figures 15 and 16 provide an understanding of the overall FDI position of the major powers (excluding Russia) during the final two decades of the Cold War.[28] Several features stand out. First, the United States' substantially negative net balance of inflows and outflows prior to the 1980s – a pattern consistent with the particularly rapid catch-up growth that characterised the pre-oil shocks Golden Age, as US capital flowed to follower economies. Second, the mounting overall scale of the flows – in absolute terms, and as a proportion of GDP – in the 1980s, as the interconnection of the Western financial system deepened. Third, the volatility of national variations in levels of FDI flows. In proportional terms, the United Kingdom stands out as particularly involved in international investment – again, a product of the country's historic role as a trading hub and financial centre – but all of the G5 experienced major ups and downs in both inflows and outflows. Fourth, the overall magnitude of flows to and from the United States – a product of its economic leadership, technological and financial development level, and overall aggregate size.

In terms of portfolio investment, figure 17 provides data on the major powers' overall net position, again over the Cold War's final two decades.[29] This is total data, rather than merely the international component of portfolio investment. Nonetheless, for our purposes, there is an interesting visible pattern: notably, the inverse movement between the net portfolio positions of the United States and Japan, suggesting a substantial cross-border dimension to their investment behaviour. Meanwhile, a similar pattern is visible – albeit less pronounced, and on a smaller scale – between the key European economies, most obviously the United Kingdom (Europe's principal financial centre) and West Germany (its principal manufacturing centre).

[28] (Bank, 2012)
[29] (Bank, 2012)

Figure 17. Major Powers' Net Portfolio Investment, 1970-91, then-year US$ billion



Source: World Bank World Development Indicators and Global Development Finance (2012). Data excludes liabilities constituting foreign authorities' reserves.

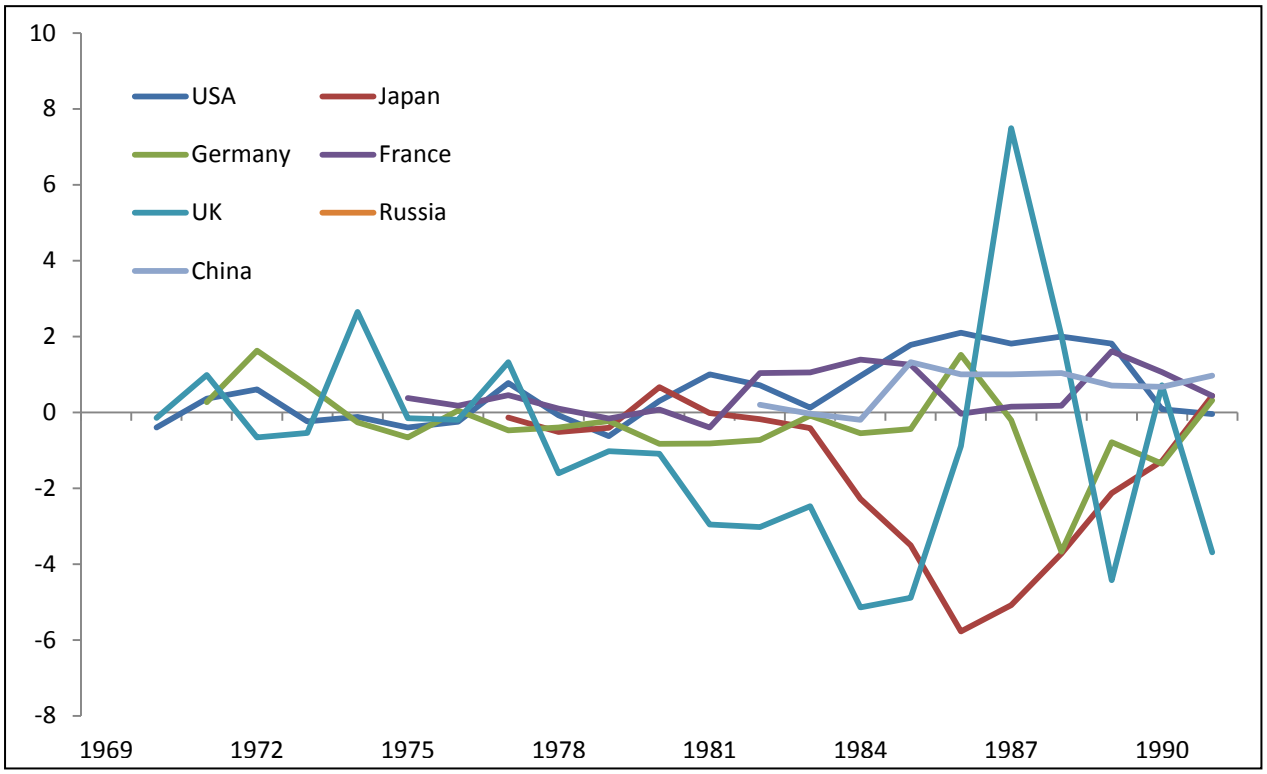
The same also goes for private capital flows, which not only display a similar in-sync motion, but also expanded as a proportion of GDP over the period in question (figure 18).[30] Figure 19 strengthens this overall perspective.[31] Returning to an insight provided by figure 2, it shows the relationship between the major powers' current account balances over the 1970 to 1991 period, with the inverse and widening movement between respective countries' curves suggesting a deepening reciprocal financial relationship, given that a current account deficit is covered by a financial account surplus.

Technology Diffusion, Labour Flows, and Information Exchange

The previous two sections demonstrated that on two key metrics of international economic integration – trade and financial flows – the Cold War was a period of deepening

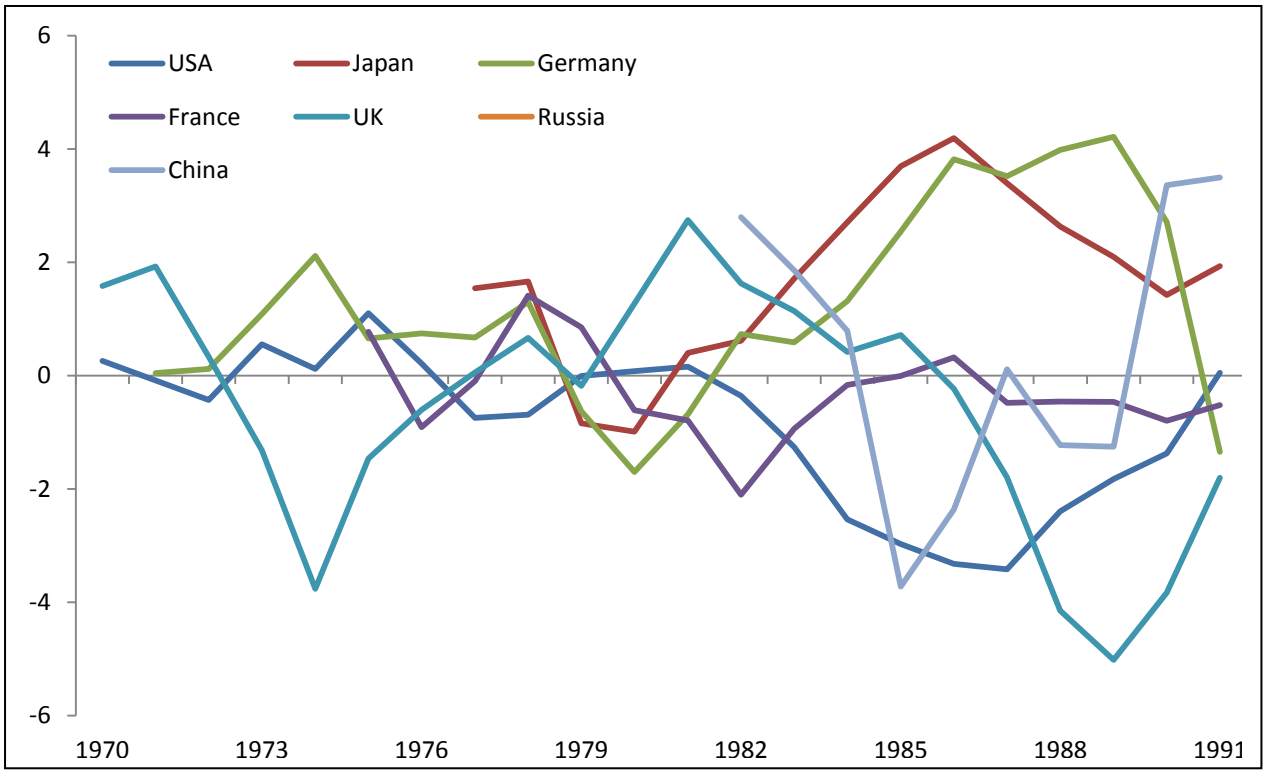
[30] (Bank, 2012)
[31] (Bank, 2012)

Figure 18. Major Powers' Private Capital Flows, 1970-91, % of GDP



Source: World Bank World Development Indicators and Global Development Finance (2012).

Figure 19. Major Powers' Current Account Balances, 1970-91, % of GDP



Source: World Bank World Development Indicators and Global Development Finance (2012).

openness, particularly prior to the 1970s oil shocks (in the case of trade) and in the 1980s (in the case of international finance). This section turns to consider the third aspect of economic openness: the cross-border diffusion of technology, labour, information, and skills. As demonstrated in the previous empirical chapters, while the hardest to metric to readily measure (hence a greater reliance on proxy indicators of such diffusion), such knowledge exchange is also perhaps the single most important driver of catch-up convergence growth. And as will be shown below and later in the chapter when we turn to a consideration of productivity convergence, this was all the more true in the aftermath of World War II.

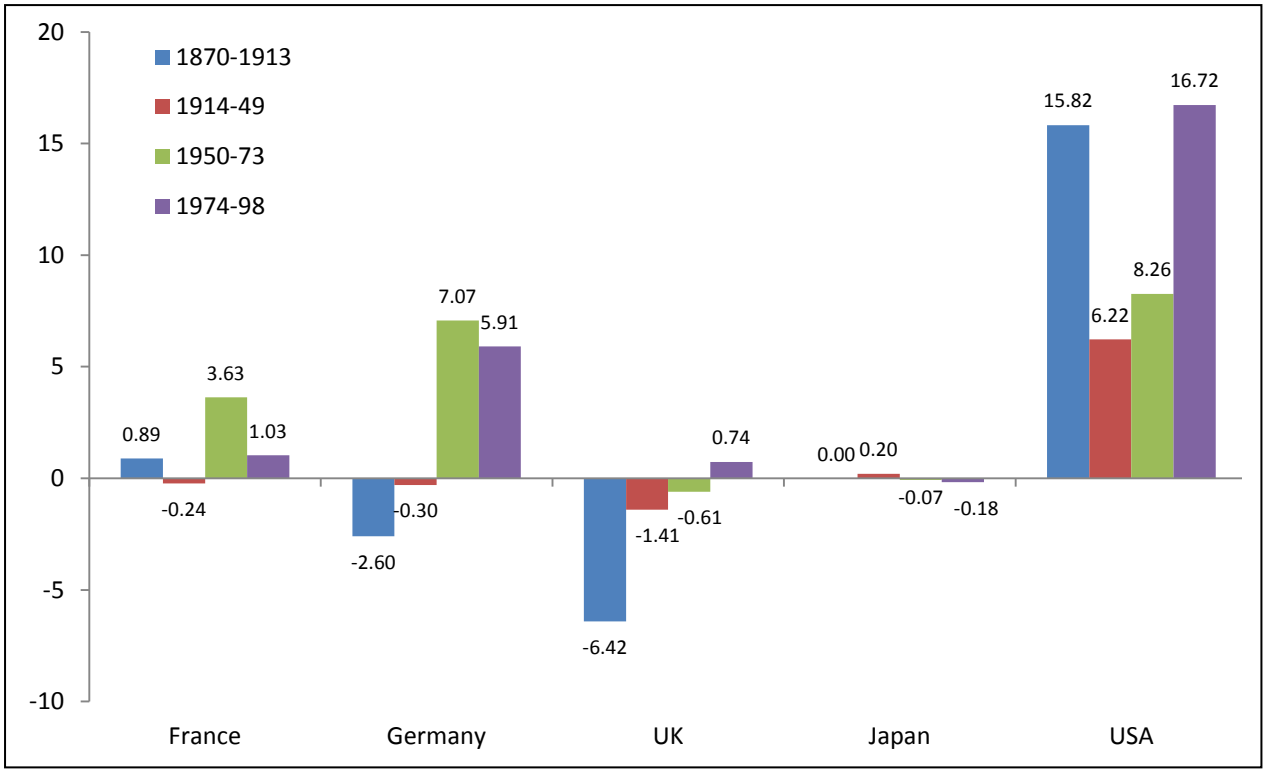
Figure 20 begins with evidence on net migration to the G5 Western economies.[32] Just as with the similar charts presented earlier that focused on trade, this makes three patterns clear. First, the 1914-49 period was one of comparatively little cross-national labour movement compared to what went before and after. Second, the 1950-73 period saw a rebounding of large-scale migration between the major advanced economies. Third, the United States – with its abundance of land and capital relative to labour – was the most appealing destination for mass migration by workers throughout the twentieth century, but from 1950 until the 1990s, Germany and France also drew substantial numbers of migrants, while the United Kingdom also began to experience net immigration after a century of net emigration later in the period (although Japan remained insular to foreign labour throughout). Clearly, such aggregate data tells us nothing about the overall quality of and skills embedded within the labour that moved, but it does at least demonstrate that there was a large-scale re-expansion of human capital flows in the wake of World War II.

Moving to another key indicator of the rapid movement of technology and information, figure 21 provides data on the growth of the major economies' air freight.[33] Data

[32] (Maddison, 2003b)
[33] (Bank, 2012)

on the growth of passenger air travel displays a similar trajectory.[34] Despite its larger internal geographic scale, which undoubtedly necessitates a much larger use of domestic air travel than in the other major economies, the overall magnitude of the United States' total lead in terms of both air freight transported and air passengers carried points clearly to its role as a centre of technology and human capital diffusion to the rest of the world.

Figure 20. Net Migration to the G5, 1870-1998, million



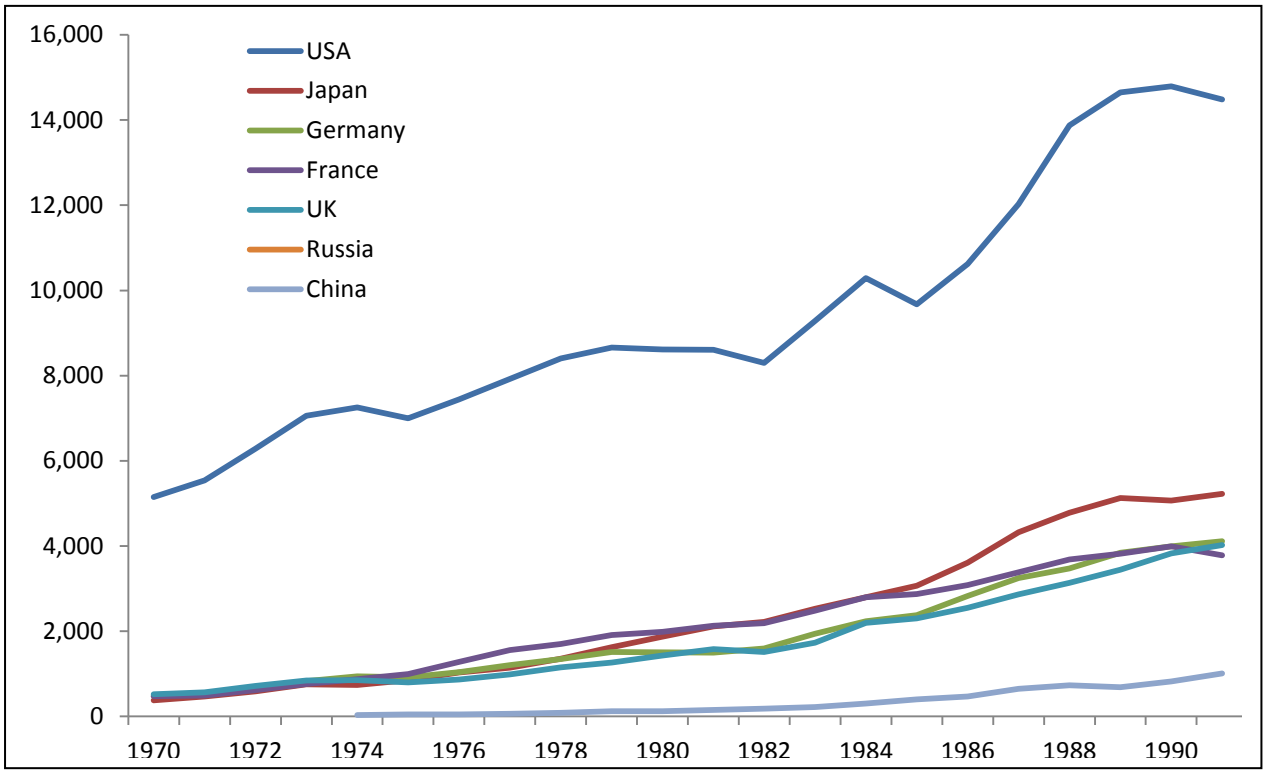
Source: Maddison (2003). Negative figure denotes net emigration.

Moving away from aggregates, an array of analyses point to the pivotal role of technology diffusion in driving catch-up growth throughout the Cold War.[35] In the pre-1973 Golden Age of capitalism, diffusion of the most advanced manufacturing knowledge and processes – particularly the mass production model promulgated by the United States – revolutionised European and Japanese industry.[36] There were of course also important

[34] (Bank, 2012)
[35] For a seminal account, in addition to the Crafts and Toniolo (1996) and Maddison (1991) work cited throughout, see (Dowrick & Nguyen, December 1989)
[36] (Crafts & Toniolo, 1996, p. 23; Maddison, 1991, pp. 152-153)

pockets of expertise in all of the advanced economies, which flowed freely between them. Again, partly this was due to conscious planning – the US government went to considerable lengths to ensure that its industrial expertise was shared with shattered European economies, as a way to fend-off the spread of communism[37] – but at least after the Marshall Plan's completion in 1952, it was predominantly a product of market pressures and flows.

Figure 21. Major Powers' Air Freight Transport, 1970-91, million ton kilometres



Source: World Bank World Development Indicators and Global Development Finance (2012).

Growth throughout the Western economies cooled after 1973 following the rise in the global oil price, and by this time much of the 'low-hanging fruit' of technology transfer from the US leader to follower economies had been exhausted. However, by the 1980s, a diffusion of another area of US technological leadership – computing and information technology – was further boosting productivity in the Western follower economies. The productivity

[37] (Maddison, 1991, p. 152)

strides of this computing- and information-enabled 'new economy' go a long way to explain the West's widening economic lead over the communist bloc, which is documented below.[38]

The Soviet Case: Differences from and Similarities with the Western Experience

The evidence above demonstrates comprehensively that economic integration deepened among the Western economies – defined broadly to include certain capitalist Asian countries, most notably Japan – in the aftermath of World War II. As a consequence, overall international economic openness deepened in terms of simple aggregate metrics. Clearly, however, there is a marked difference between an expansion of intra-Western trade, financial flows, and technology diffusion – the three key dimensions of international economic integration measured here – and the level of economic exchange between the US-led capitalist and USSR-led communist blocs. After all, both of these economic blocs had conscious policies to severely limit economic exchange with the other. The point of this section, therefore, is to assess the extent to which the Soviet Union – as the principal non-capitalist major power (indeed, the only non-capitalist major power if impoverished and agrarian China is excluded) – was involved in international economic exchange.

On the one hand, there is compelling evidence that the Soviet Union was not *as* closed to economic exchange with the West as the conventional caricature of the Cold War might seem to suggest. First, there was substantial Western technology transfer to the Soviet Union – but this occurred largely before the onset of the Cold War. The Soviet Union was keen to benefit from the US technological lead and aspects of the US economic model, while for its part, the United States saw opportunities to benefit from newly-communist Russia's turn away from aristocratic feudalism and the ensuing economic modernisation drive.[39] The result was an array of foreign business concessions, joint-stock companies, and foreign technical

[38] (Dowrick & Nguyen, December 1989; Temple, Autumn 2002)
[39] (Bailes, July 1981; Holliday, 1979; Lewis, 1994, pp. 214-215)

assistance programmes in the USSR.[40] Moreover, during World War II, American – and to a lesser extent British – technology transfer represented a key component of the Western war effort and an economic lifeline to the Soviet Union.[41] Estimates vary, but it has been suggested that such Western Lend-Lease accounted for between 10 and 20 percent of Soviet GDP during its economic low point in 1943-44; even as the Soviet economy was achieving unprecedented outputs of arms and munitions, it was heavily reliant on the United States and United Kingdom for jeeps, lorries, communications equipment, marine technology, and so forth.[42]

Even in the aftermath of the war, when tensions between the Soviet Union and the Western powers were already beginning to manifest themselves, Western assistance to the Soviet Union on advanced technological programmes did not initially cease entirely[43] – indeed, it even remained of a sufficient scale to be a source of occasional tension within the Western alliance.[44] And in addition to such 'free' (albeit war-enabled) dimensions of technology transfer, the immediate post-war era also saw huge-scale forced transfer of advanced Western technology to the Soviet Union, in the form of the removal of German and Japanese industrial plant, other machinery, scientists and engineers from formerly Axis-controlled territory that had fallen into Soviet hands.[45] The result of this combination of pre-war Western economic transfer, intra-war Western military-industrial support, and post-war technological extraction from conquered-yet-more-advanced industrial powers meant that in the early years and especially the years immediately prior to the Cold War, total Western technology transfer to the Soviet Union happened on a large – albeit impossible to accurately

[40] (R. W. Davies, 1998, p. 44; Parrott, 1983, p. 27)
[41] (Findlay & O'Rourke, 2007b, p. 474)
[42] (R. W. Davies, 1998, p. 63; M. Harrison, 1994, p. 251)
[43](Parrott, 1983, p. 104)
[44] (Holliday, 1979; Stent, 1983)
[45] (R. W. Davies, 1998, p. 65; Naimark, 1995, p. 190; Nove, 1992, p. 296; Parrott, 1983, p. 104)

quantify – scale. And as will be shown below, that movement had a significant impact on the Soviet Union's early Cold War productivity growth.

In terms of goods trade, as figures 6 and 8 made clear, the 1950-73 was a particularly strong period of growth for both trade volume and trade as a proportion of GDP for the Soviet Union and its Eastern European satellites. The difference, however, is that Soviet trade was predominantly focused within the communist bloc, which – unlike the capitalist bloc – contained no other major economies.[46] Moreover, as will be shown later in the chapter, the post-war Soviet Union's financial connection to the Western economies only deepened in the latter the years of the Cold War, by which point its increasing indebtedness was primarily a symptom of economic weakness.[47]

Following from the previous point, there are many metrics by which the Soviet Union engaged in nowhere near as much international economic exchange – particularly with other large industrialised economies – as its capitalist peers did. As noted above, trade with the West was limited; that which occurred was mainly restricted to commodities (Soviet oil exports and US grain exports), along with some less-than-cutting-edge industrial products (from the United States) and chemicals (from the Soviet Union).[48] Indeed, even prior to the war, when a degree of technology sharing was occurring, a low overall level of foreign trade was hindering the process of knowledge transfer and modernisation, and this pattern persisted after 1945.[49] The Soviets also substantially curtailed technology exchange with the West – ultimately to their own detriment – as the Cold War deepened, although the precise level of enthusiasm for seeking access to Western technology varied according to fluctuations in the power of the pro- and anti-openness factions in Soviet domestic politics.[50] Rigid censorship and restrictions on international travel were severely detrimental to efforts to interact with

[46] (R. W. Davies, 1998, p. 72; Turnock, 1997)
[47] (Neu & Lund, August 1987)
[48] (Goodrich, May 1989)
[49] (Lewis, 1994, p. 215)
[50] (Parrott, 1983, pp. 139-151)

and absorb foreign research, both scientific and industrial.[51] And as also noted above, a closure to Western investors – joint-stock companies were discontinued, for instance, and the foreign shares nationalised – and limited interaction with the Western financial system characterised the Soviet Union from shortly after its victory in World War II until the economic deterioration of the 1980s.[52]

In short, the answer to the question of whether the Soviet Union – one of the two principal great powers of the period – was economically integrated during the Cold War is 'partly yes and partly no.' There *was* a connection between the USSR and the Western economies sufficient to deliver catch-up growth potential – at least during the first two decades. Yet there was also far *less* connection than the Western economies shared between themselves, which is significant in explaining the relative decline of the Soviet economy compared to even second-tier Western powers in the latter years of the Cold War.

Catch-Up and Convergence Growth in the Cold War

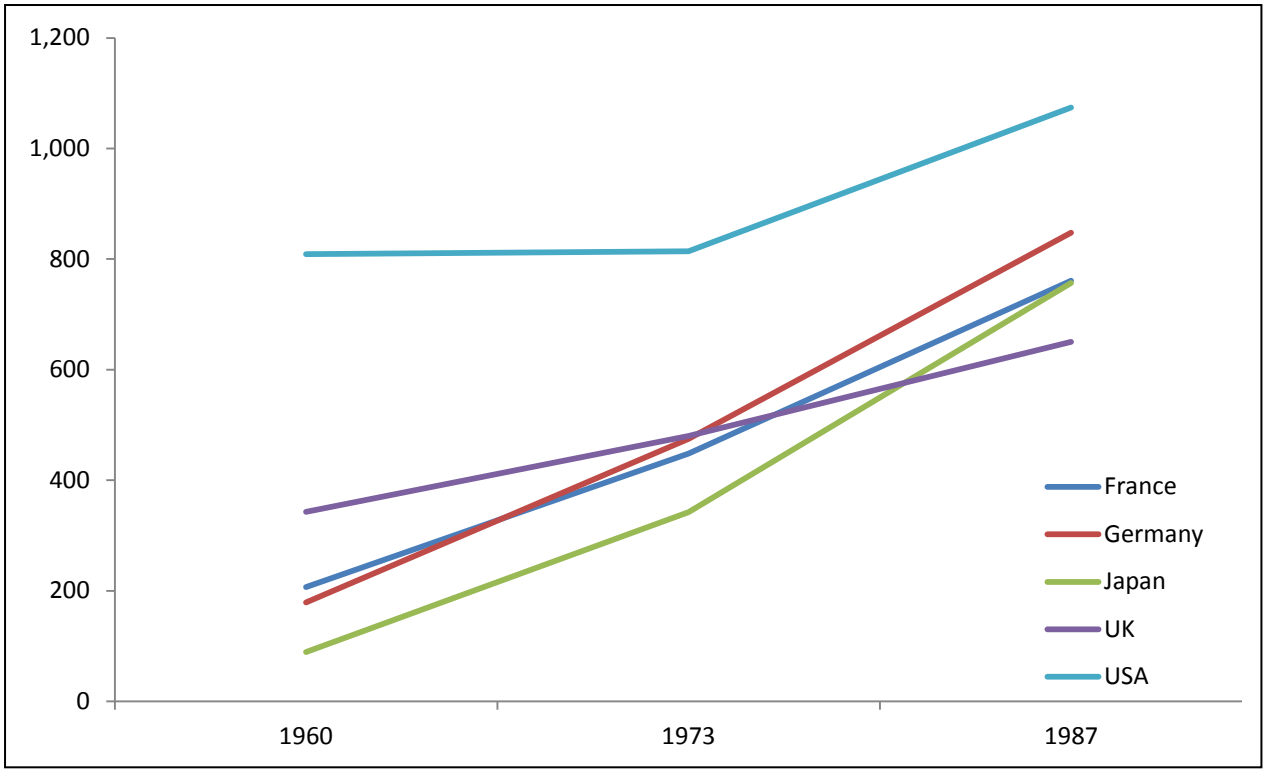
The chapter until now has been devoted to explaining the extent to which economic integration deepened in the years after 1945. This section turns to consider the impact of trade, financial flows, and technology diffusion on economic growth in the same period.

As noted throughout, on the culmination of World War II in 1945, the United States was by far the most developed state in the international system. Accordingly, like the United Kingdom at the start of the 1870-1914 period, the United States was the height of technological advancement towards which other states could converge. Figure 22 quantifies this insight by demonstrating the scale of the US lead in terms of research and development (R&D) spending.[53] While data is unfortunately not available for prior to 1960, the scale of the US lead during the early Cold War – even compared to the other advanced economies – is

[51] (R. W. Davies, 1998, p. 81)
[52] On the former, see (Nove, 1992, p. 296) On the latter, see (Neu & Lund, August 1987)
[53] (Maddison, 1991, p. 152)

obvious; at the same time, however, so too is the convergence of the rest of the G5 towards US R&D levels by the end of the 1980s.

Figure 22. R&D Spending in the G5, 1960-87, 1985 US$ per employed person



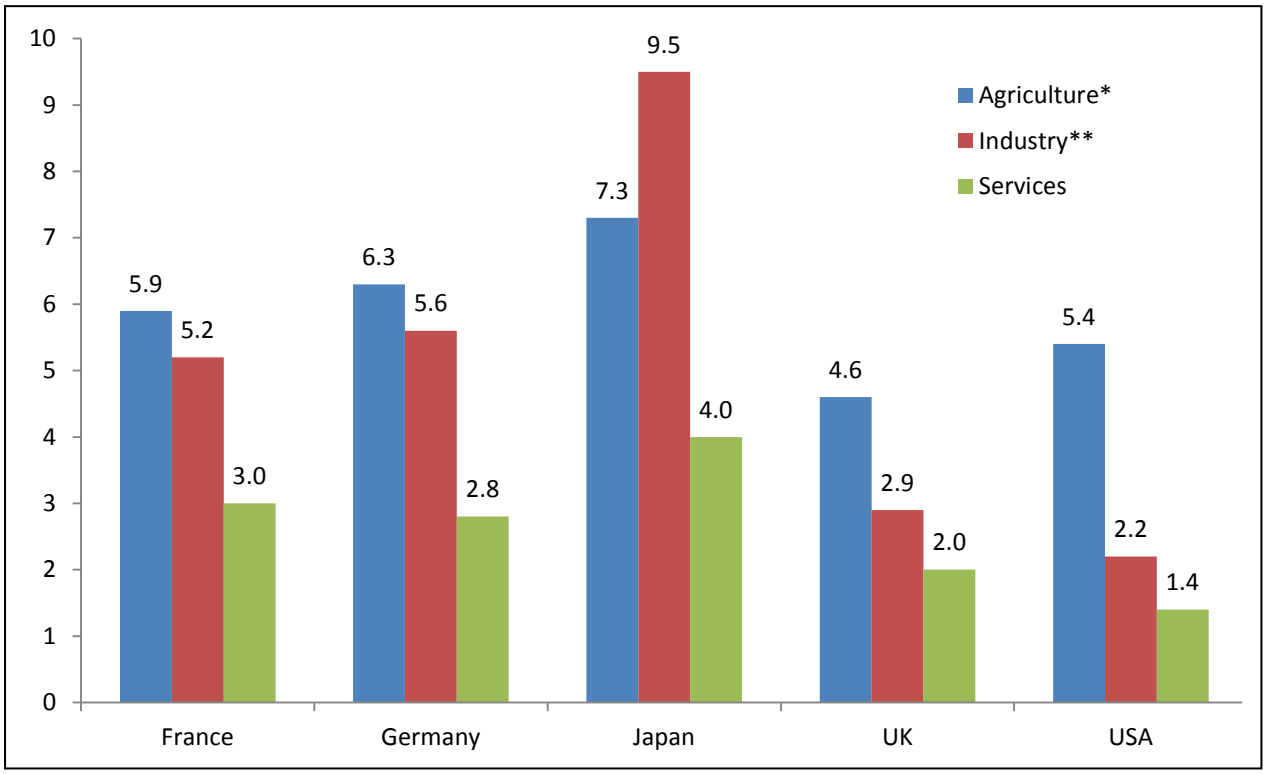
Source: Maddison (1991), p. 152. Data is for the total annual research and development spending in each economy, in 1985 US$ prices, per employed member of each respective economy's population.

Productivity Convergence

Figure 23a depicts G5 labour productivity growth broken down by agriculture, manufacturing, and services for the 1950-73 (pre-oil shock) period.[54] Significantly, the non-US G5 economies all experienced stronger productivity growth in all sectors than the United States (the one exception being UK agriculture, which achieved a high level of proficiency prior to 1950). French, West German and most notably Japanese manufacturing all experienced particularly rapid productivity improvements. After the oil shock, productivity growth slowed throughout the G5 – as figure 23b makes clear – but it still remained (a) healthy and (b) stronger in the non-US G5 than in the United States (the one exception this

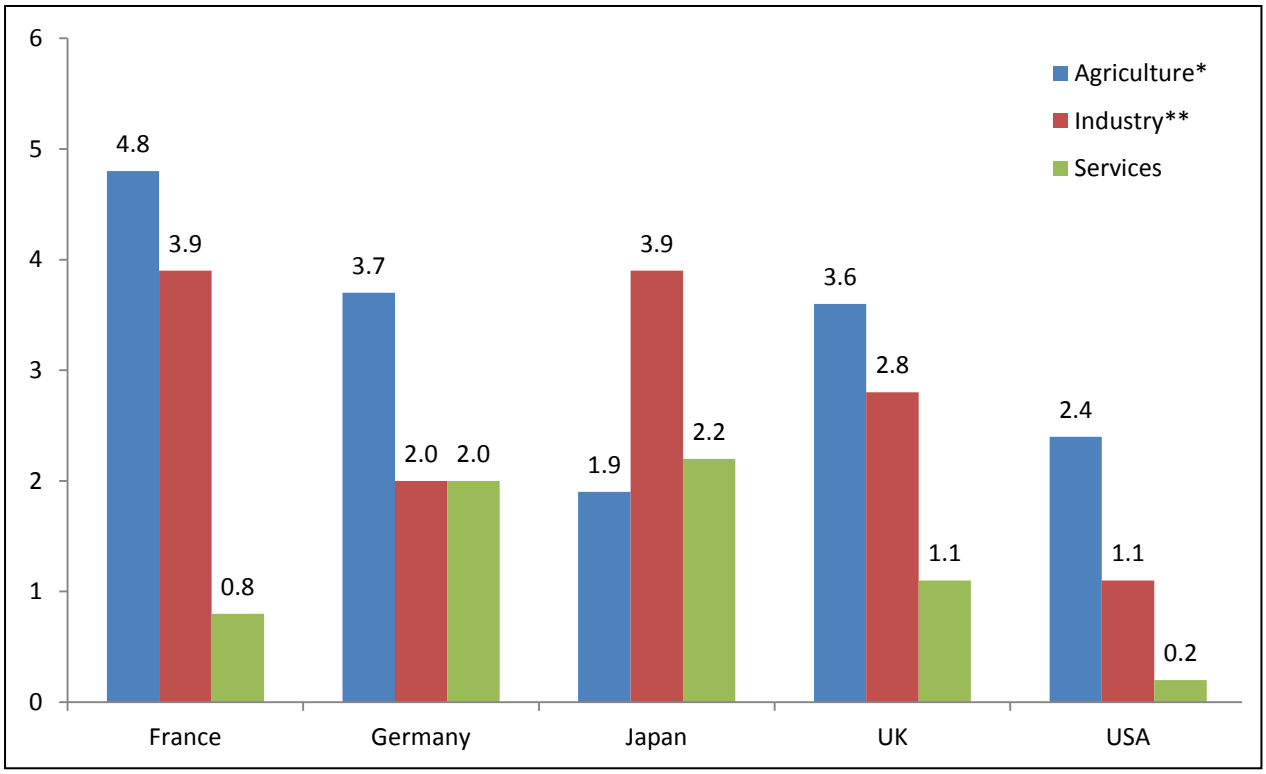
[54] (Maddison, 1991, p. 150)

Figure 23a. Sectoral Labour Productivity Growth in the G5, 1950-73, %



Source: Maddison (1991), p. 150. Data is annual average compound growth rates. *Agriculture includes forestry and fishing. **Industry includes construction.

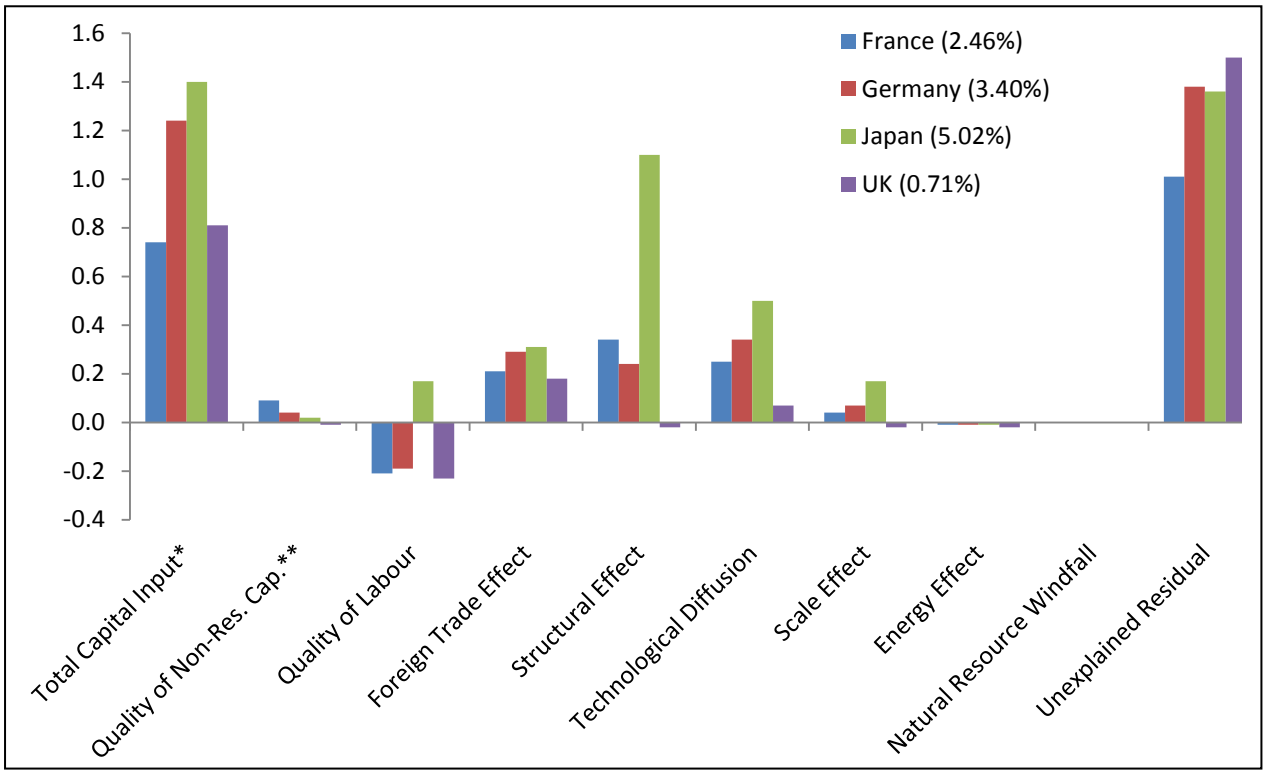
Figure 23b. Sectoral Labour Productivity Growth in the G5, 1973-87, %



Source: Maddison (1991), p. 150. Data is annual average compound growth rates. *Agriculture includes forestry and fishing. **Industry includes construction.

time being Japanese agriculture).[55] Accordingly, there is strong evidence of productivity convergence across sectors throughout the Cold War among the major Western economies, with the principal European states and Japan all catching-up with US productivity levels (a result that also applies to the wider OECD).[56]

Figure 24a. Accounting for G5 Labour Productivity Convergence on the USA, 1950-73, %



Source: Maddison (1991), p. 162. Average annual compound growth contribution of different catch-up factors to overall convergence figure (in parentheses). *Total capital input per man-hour worked. **Quality of non-residential capital.

Moving beyond the basics of correlation, figures 24a and 24b detail the drivers of the observed labour productivity convergence within the G5 for 1950-73 and 1973-87, respectively, with the figure in parentheses in the chart legend representing the total average annual convergence figure for each country during each of the two periods.[57] Of the key factors driving convergence, total capital accumulation stands out as the single most

[55] (Maddison, 1991, p. 150)
[56] (Maddison, 1991, pp. 129-130)
[57] (Maddison, 1991, pp. 162-163)

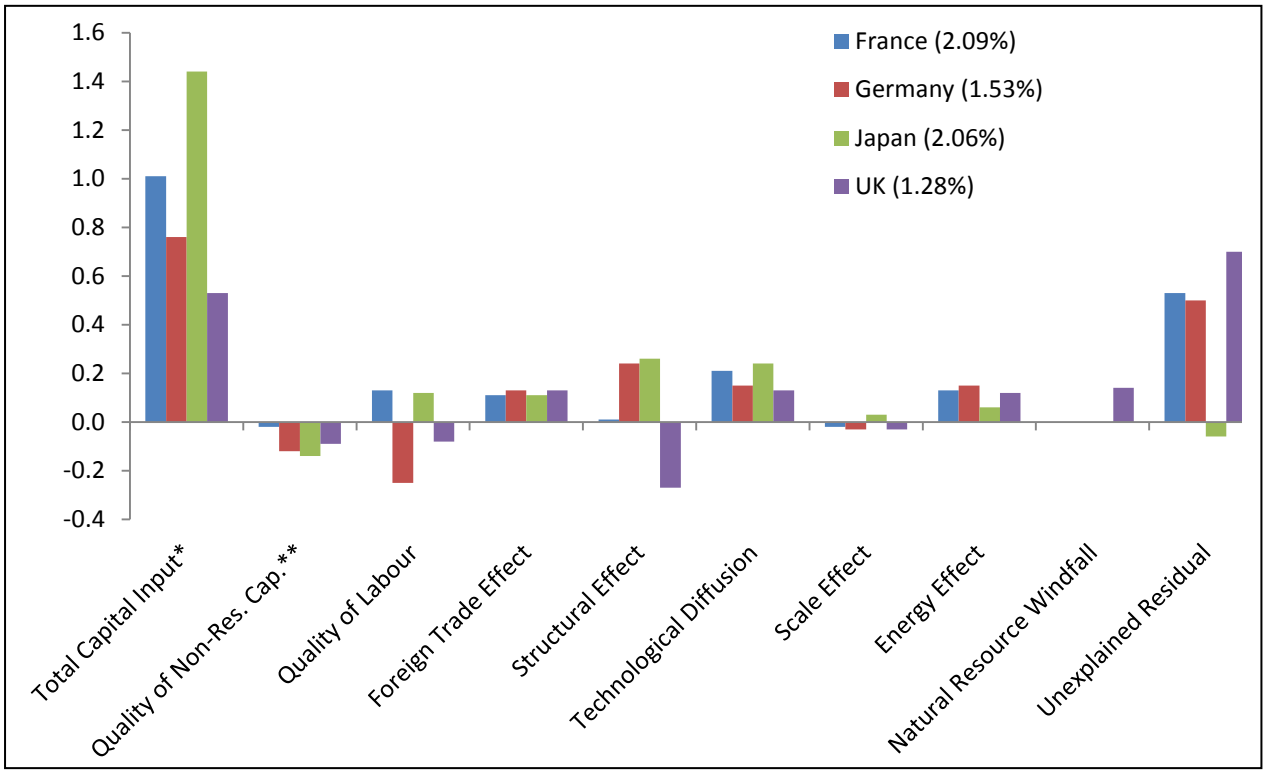
important in both the pre- and post-1973 epochs – and this fits with both the evidence of international capital flows to follower economies detailed above, and the dissertation's wider theory. The foreign trade effect – the efficiency of specialising according to comparative advantage and accessing a wider global market – is an obvious fit with the evidence and theory presented above (although as detailed throughout, trade also offers other convergence benefits beyond these efficiency and market gains, most obviously via its facilitation of knowledge transfer). The technological diffusion effect is another obvious product of the evidence and theory presented above. The structural effect – shifting the national economic model from agriculture, resource extraction and basic manufacturing to higher value-added manufacturing and advanced services – is further facilitated by an expansion of trade, capital flows, and knowledge transfer, insofar as they enable labour to move out of low-productivity sectors. Meanwhile, in terms of factors hindering convergence, the quality of non-US G5 labour and – after 1973 – the quality of non-US G5 capital investment was not quite as high as in the United States. In short, the trade, financial flows and technology diffusion that sit at the heart of this dissertation's theory were key contributors to convergence within the G5.

Turning to data that incorporates the Soviet Union, figures 25a and 25b present disaggregated data on the drivers of labour productivity growth in the United States, the USSR, and the three major Western European economies for the periods 1960-70 and 1970-90, respectively (with the black columns and italicised figures denoting total growth).[58] On the Western European side, the familiar pattern is again present in the 1960-70 chart: West Germany and France, and to a lesser extent the United Kingdom, display strong total capital growth and total factor productivity (TFP) growth. The United States displays the strongest human capital growth, but its TFP growth was weaker than that of Germany and France and total capital growth was minimal. Meanwhile, the Soviet Union displays strong capital

[58] (Crafts & Toniolo, 2010, p. 306)

growth – a product of a continued commitment, in successive five-year economic plans, to industrial plant development. However, its TFP and human capital gains were by far the weakest of the five states.

Figure 24b. Accounting for G5 Labour Productivity Convergence on the USA, 1973-87, %

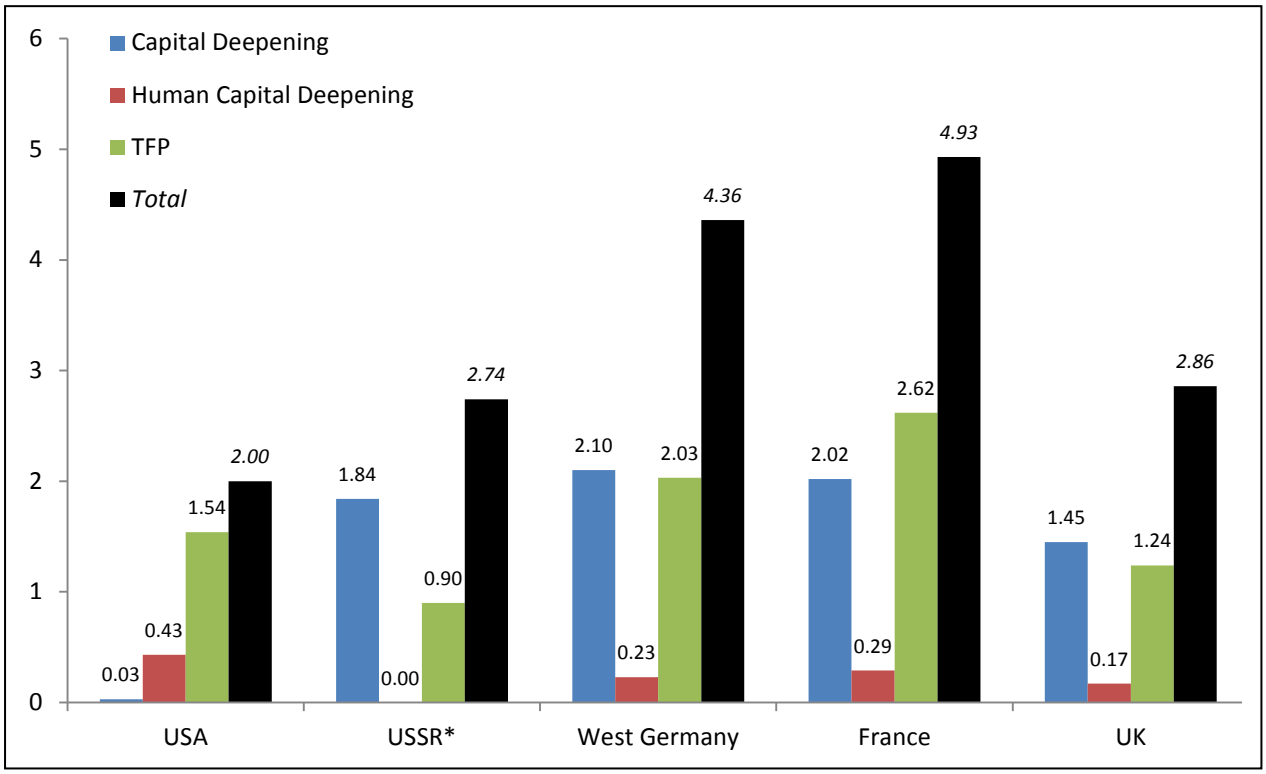


Source: Maddison (1991), p. 163. Average annual compound growth contribution of different catch-up factors to overall convergence figure (in parentheses). *Total capital input per man-hour worked. **Quality of non-residential capital.

By the 1970-90 period, Soviet performance was even weaker: there was still strong capital deepening going on, as fitted with Soviet economic doctrine, but – shielded as Soviet industry was from the competitive pressures of the global marketplace – TFP and human capital growth were actually negative. The result was that Soviet labour productivity growth was no stronger than that of the United States after 1970, despite the latter being the technological lead economy.[59] Accordingly, the Soviet inability to close the development gap

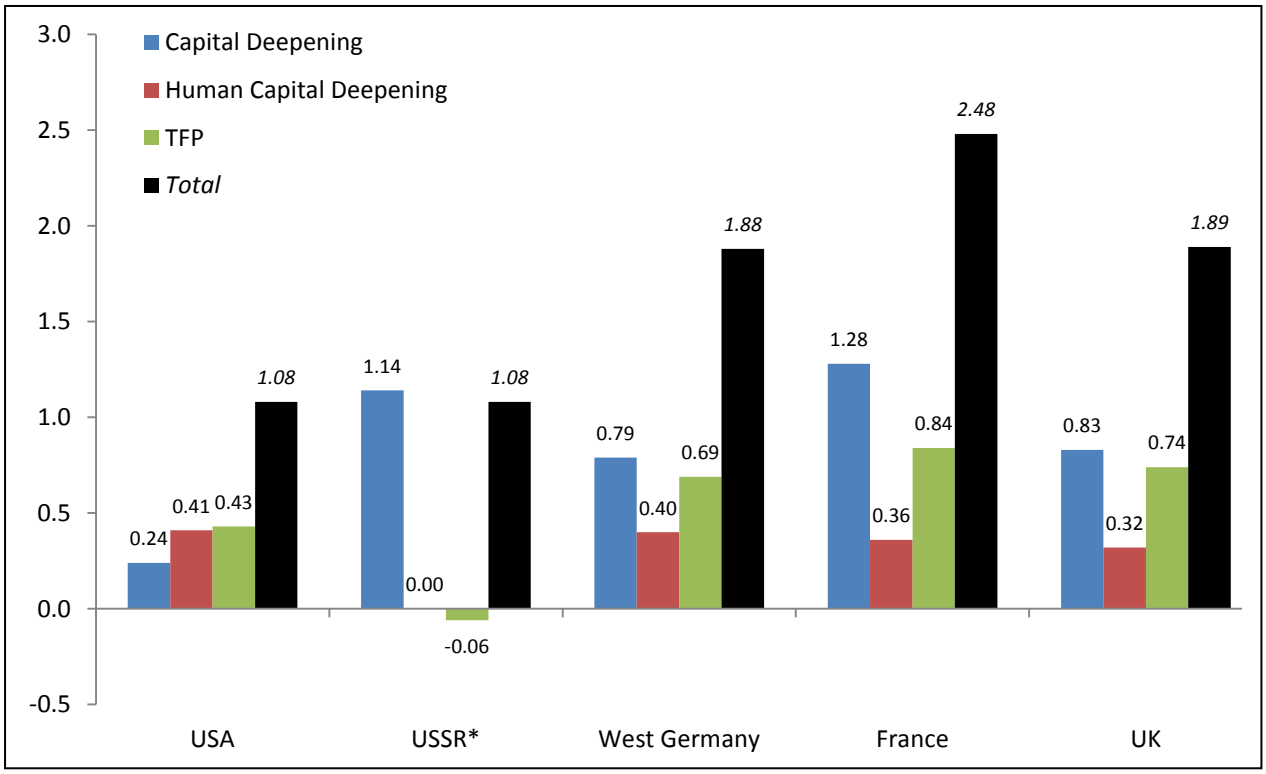
[59] Of course, saying that there was no scope for catch-up convergence only applies to the economy in the aggregate; at the level of specific economic sectors, all of the G5 had particular strengths and areas of technological leadership, meaning that all of the participants in economic exchange stood to gain.

Figure 25a. Contributions to Major Power^ Labour Productivity Growth, 1960-70, % per year



Source: Crafts and Toniolo (2010), p. 306. *For USSR, human capital deepening is subsumed in total factor productivity (TFP). ^Excluding Japan and China.

Figure 25b. Contributions to Powers'^ Labour Productivity Growth, 1970-90, % per year



Source: Crafts and Toniolo (2010), p. 306. *For USSR, human capital deepening is subsumed in total factor productivity (TFP). ^Excluding Japan and China.

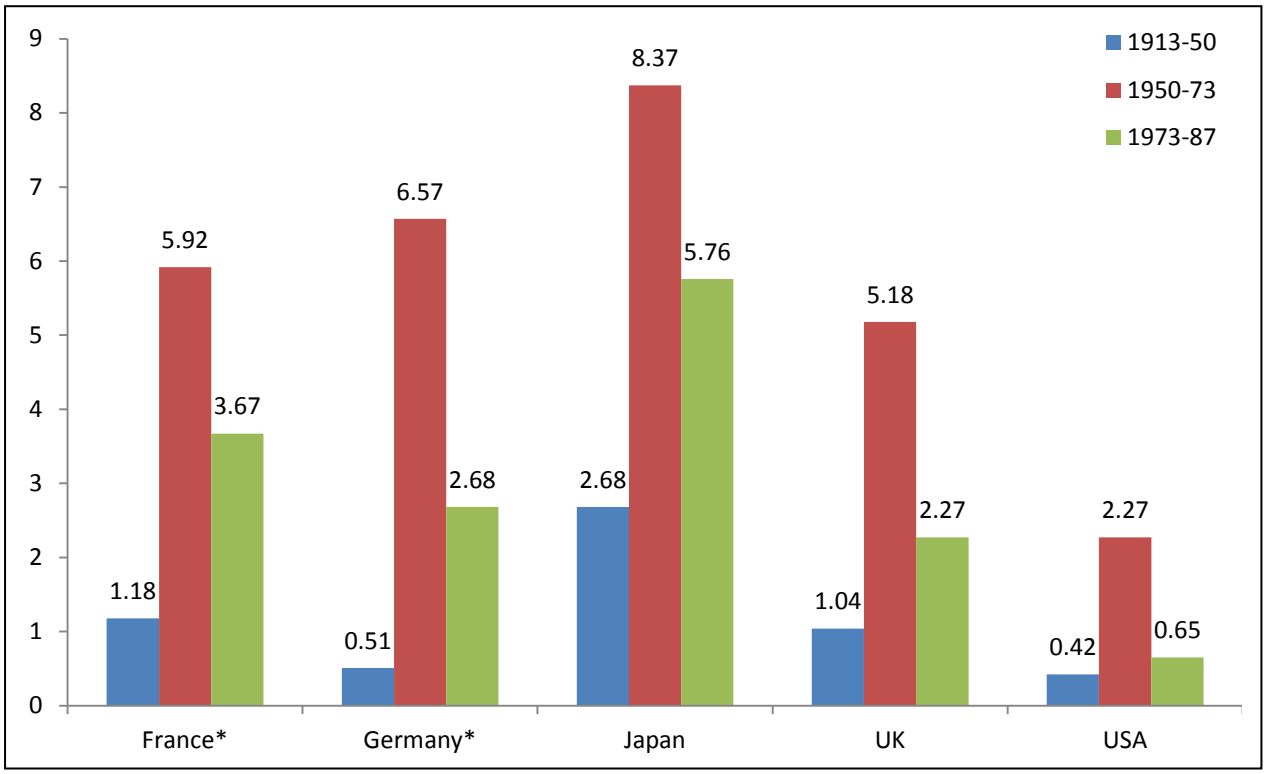
between itself and the Western powers in the Cold War's final two decades is easily understood. Meanwhile, the Western European economies continued to perform well in the 1970-90 period, posting stronger labour productivity growth than the United States and thereby continuing the convergence process. Again, TFP growth and total capital deepening were healthy – albeit not at the blistering pace of the 1960s – and human capital growth was slightly stronger than in the preceding decade. Variations in openness between the USSR and Western Europe go a significant way towards explaining this variation – although, of course, the planned nature and domestic rigidity of the Soviet economy also bears much blame for its comparative underperformance. The competitive pressures of trade and diffusion of the most advanced technology both serve to explain the West's comparatively strong TFP performance, while the free flow of information and international investment also contribute to human capital improvements (although domestic policy is also obviously critical, particularly in education). Meanwhile, international capital flows contribute to overall capital deepening: to be sure, Soviet capital deepening was also strong, but political efforts to target such domestic investment were less efficient than market allocation.

On the subject of the capital stock, given its role documented by figures 24 and 25, figure 26 presents data on the average annual growth of the net non-residential capital stock per employee in the G5 over the 1913-50, 1950-73, and 1973-87 periods.[60] Of course, heavy capital investment in the 1950-73 period in the Western European powers and Japan would be expected even in the absence of any international economic exchange, given the destruction of industrial plant and infrastructure that occurred between 1939 and 1945 in those four members of the G5. Yet the particularly strong growth of these four states' capital stock in 1950-73, and the still-US-outstripping growth shown in 1973-87 – which was even

[60] (Maddison, 1991, pp. 141-142)

more pronounced when viewed in terms of capital per worker – is wholly consistent with the financial flows (and technology transfer) detailed earlier in the chapter.

Figure 26. Growth of G5 Net Non-Residential Capital Stock per Employee, 1913-87, %

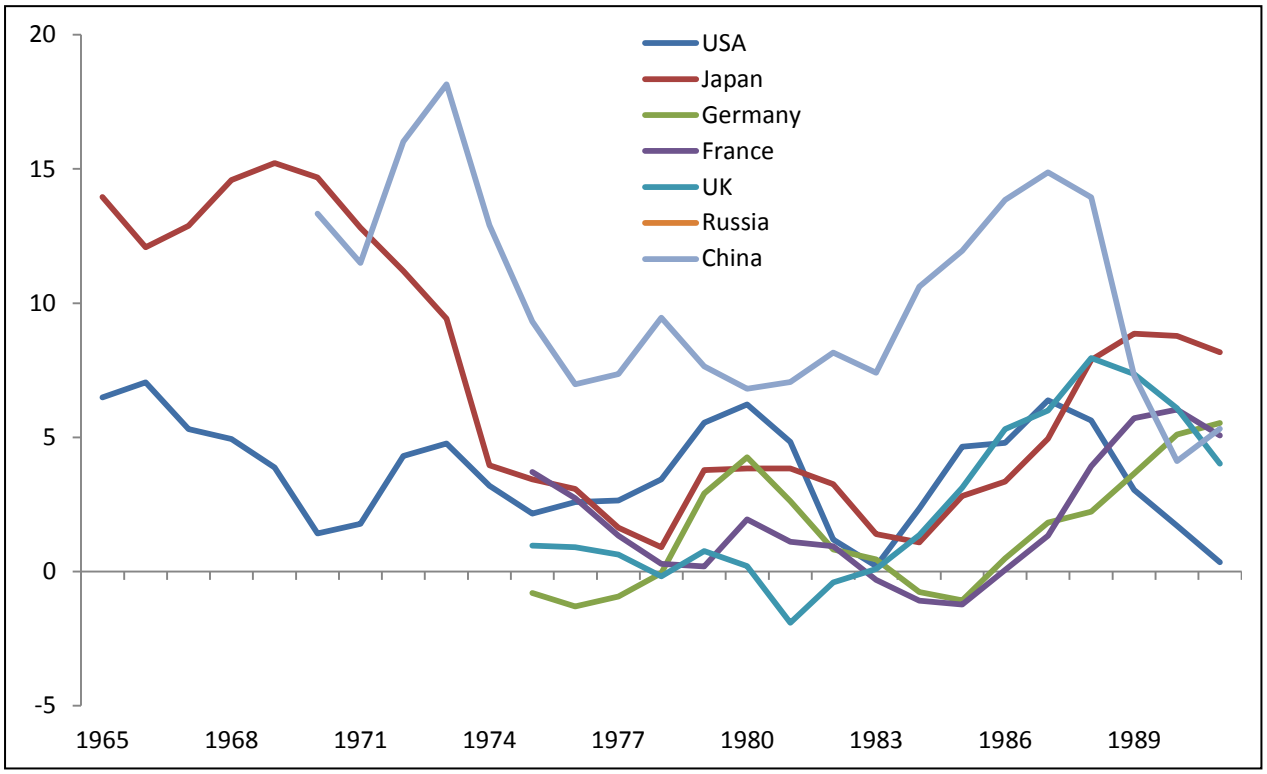


Source: Maddison (1991), p. 142. Data is annual average compound growth rates in each epoch, per employed person only. *Proxy estimates.

Further supporting information on the evolution over time of the Western powers' capital growth comes from the gross fixed capital formation (GFCF) detailed in figure 27 for the final quarter-century of the Cold War.[61] This chart demonstrates in particular the strength of Japanese GFCF growth in the late 1960s and 1970s, the boost that all Western powers' GFCF experienced in the late 1980s, and – significantly for the contemporary era – the strength of Chinese GFCF growth from the 1970s.

[61] (Bank, 2012)

Figure 27. Gross Fixed Capital Formation in the Major Powers, 1965-91, % annual growth



Source: World Bank World Development Indicators and Global Development Finance (2012). Data is five-year rolling averages, to smooth annual volatility. No Europe data available prior to 1975.

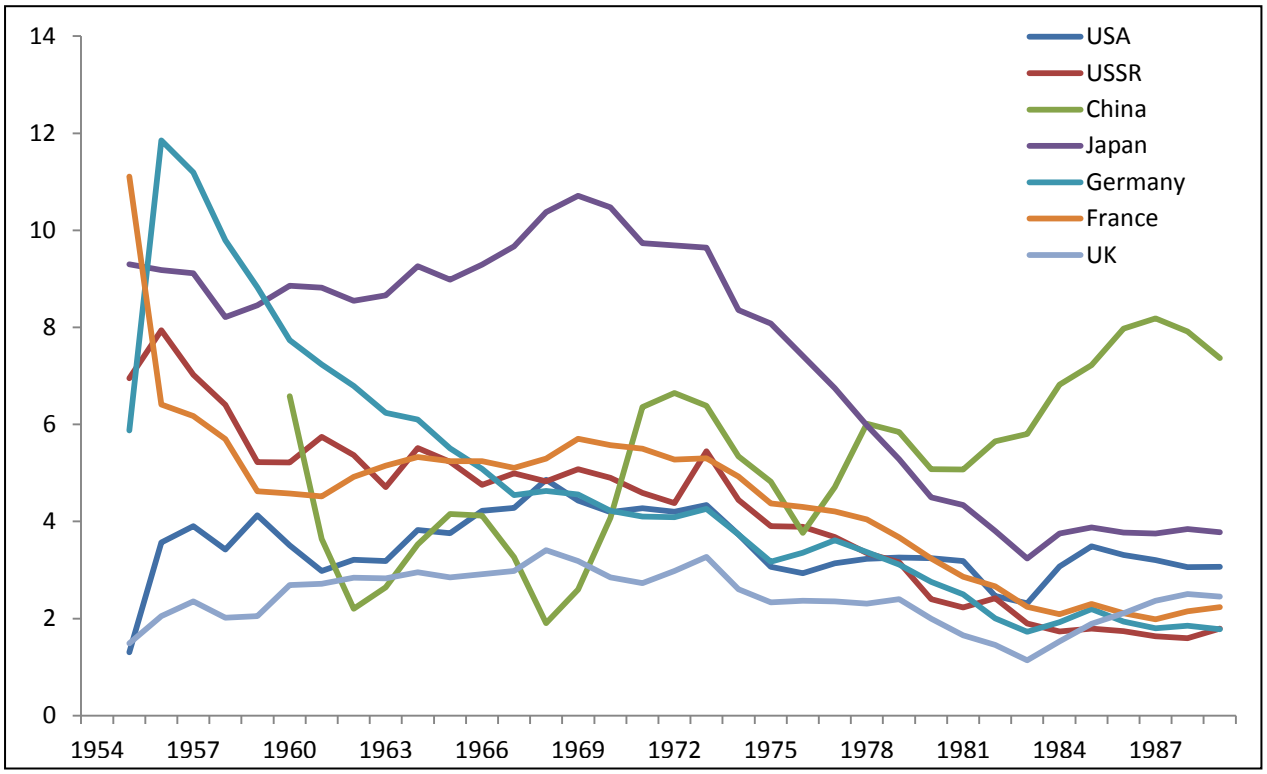
Catch-up GDP Growth

Given the evidence of productivity convergence detailed above, what impact did this have on the various major economies' overall levels of economic output? Figures 28 and 29 provide a first insight, detailing the growth (using ten-year rolling averages, to smooth-out cyclical spikes) of the major powers' PPP GDP and GDP per capita, respectively.[62] The strong growth of Japan, West Germany, and France throughout the period – growth that outstripped that of the start-of-period lead economy, the United States (and also that of the G5 underperformer, the United Kingdom), until the 1980s, in France and Germany's case, or the 1990s, in Japan's case – stands out in both charts, reflecting the productivity trends discussed above. Likewise, the Soviet Union's strong growth in the early Cold War followed by its persistent relative economic underperformance and atrophy is plain to see, with the

[62] (Maddison, 2003b)

USSR's growth on both total GDP and per capita metrics being the weakest of all the major powers by the 1980s. A final significant point is the strength of Chinese growth by the 1980s.

Figure 28. Major Powers' GDP Growth, 1955-91, % year-on-year



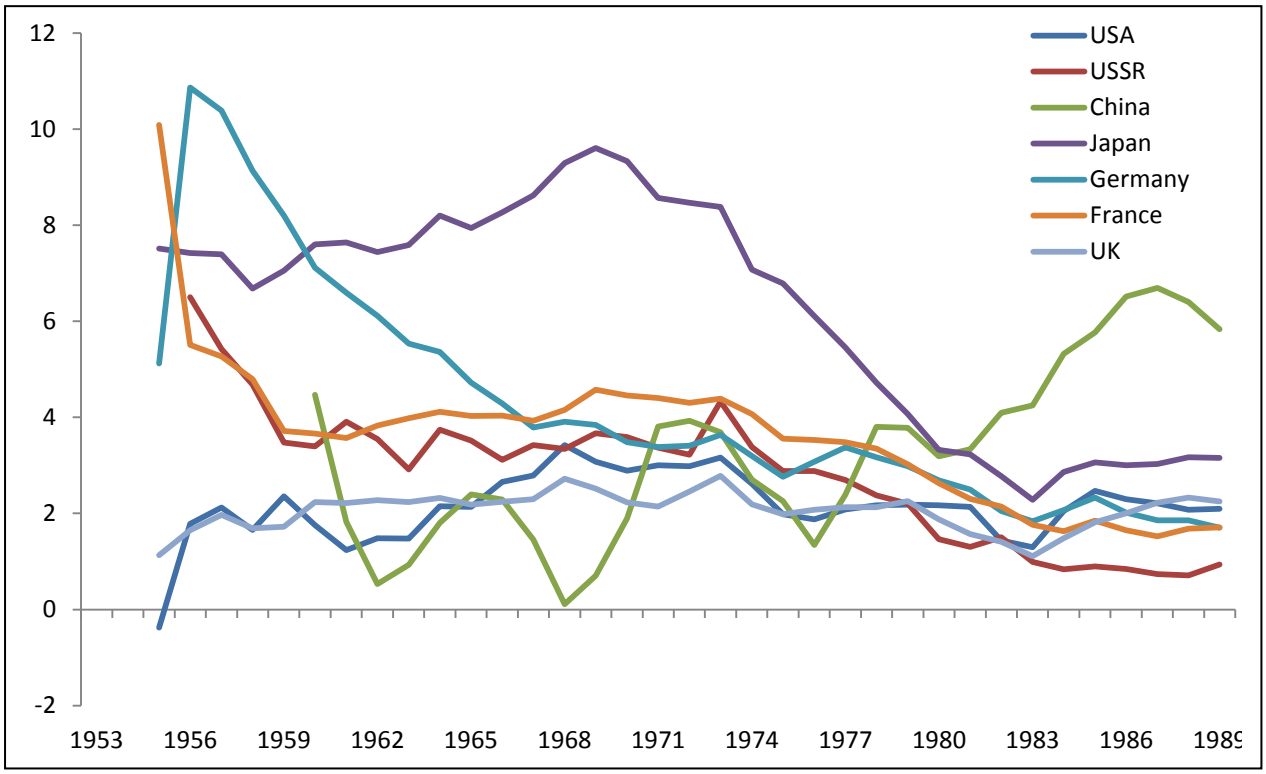
Source: Maddison (2003). Data is ten-year rolling averages, to smooth annual volatility (hence the data point for 1955 includes the decade going back to 1946 inclusive, and so on). Unit of measurement is 1990 US$ (Geary-Khamis PPP dollars).

Turning to put such major power GDP growth performance in the wider context of the advanced economies, figure 30 presents data on the acceleration of growth performance of fifteen developed economies between 1913 and 1989.[63] The spectacular acceleration of average annual growth in the 1950-73 Golden Age compared to what went before, and the subsequent deceleration of growth in 1973-89 compared to the preceding Golden Age, are both apparent for all fifteen economies, consistent with the OECD productivity shifts described earlier.

What effect did these growth rates have on actual per capita development levels in the major economies? Figure 31 details the major powers' GDP per capita from 1945 to 1991 in

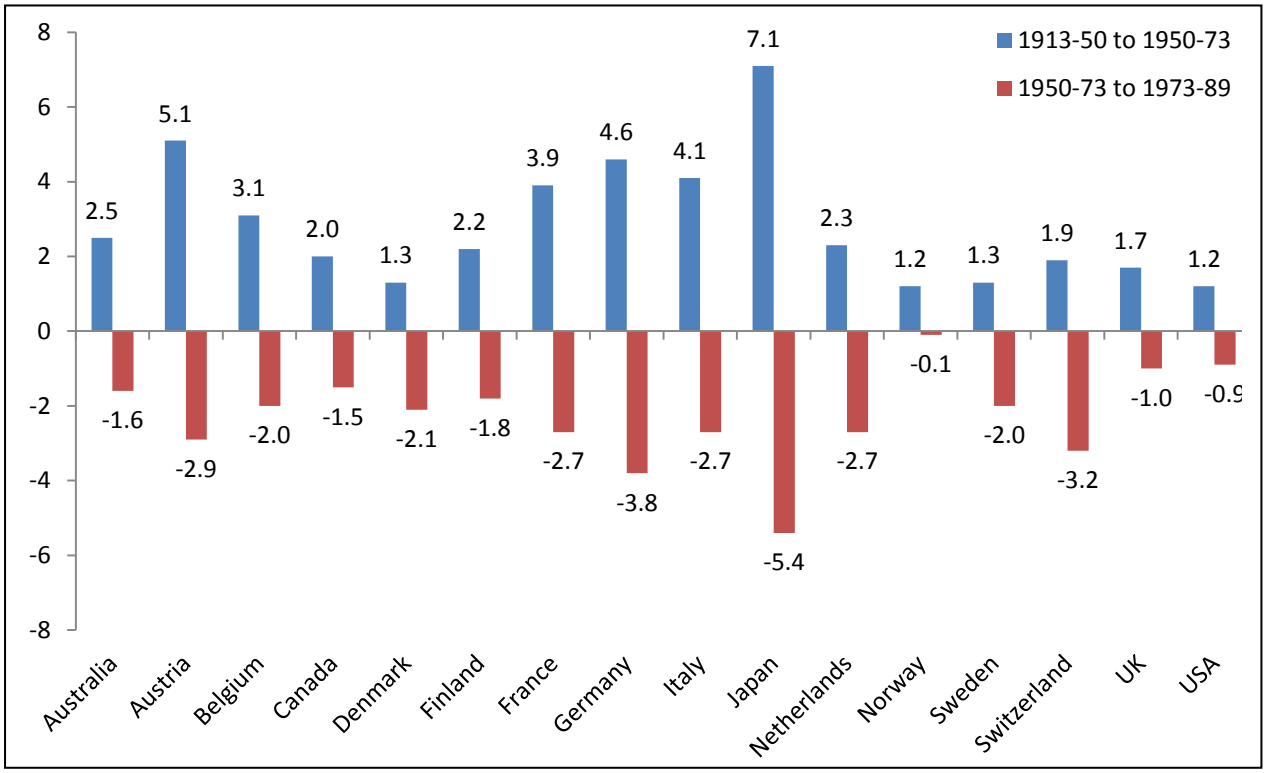
[63] (Maddison, 1991, p. 129)

Figure 29. Major Powers' per Capita GDP Growth, 1955-91, % year-on-year



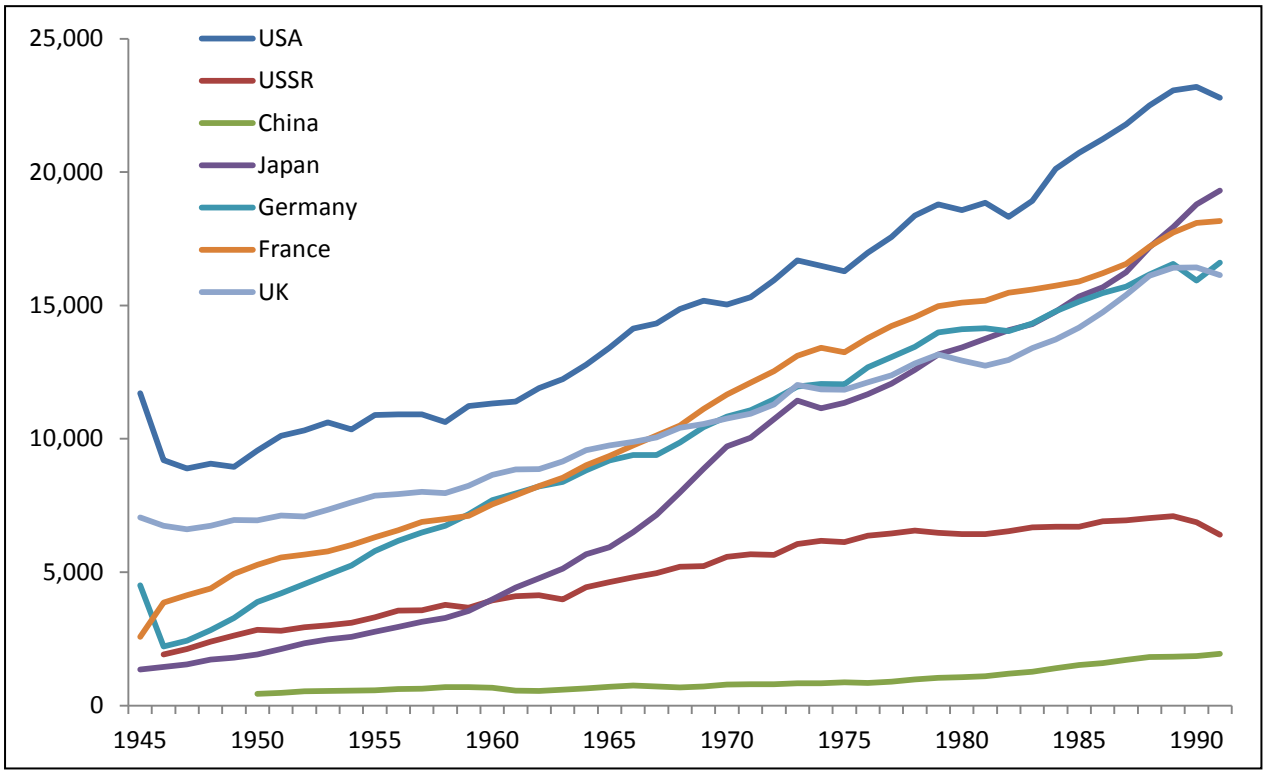
Source: Maddison (2003). Data is ten-year rolling averages, to smooth annual volatility (hence the data point for 1955 includes the decade going back to 1946 inclusive, and so on). Unit of measurement is 1990 US$ (Geary-Khamis PPP dollars).

Figure 30. Acceleration and Deceleration of GDP Growth in the OECD, 1913-73 and 1950-89, differences in annual average %



Source: Maddison (1991), p. 129.

Figure 31. Major Powers' GDP per Capita (Purchasing Power Parity), 1945-91, 1990 US$



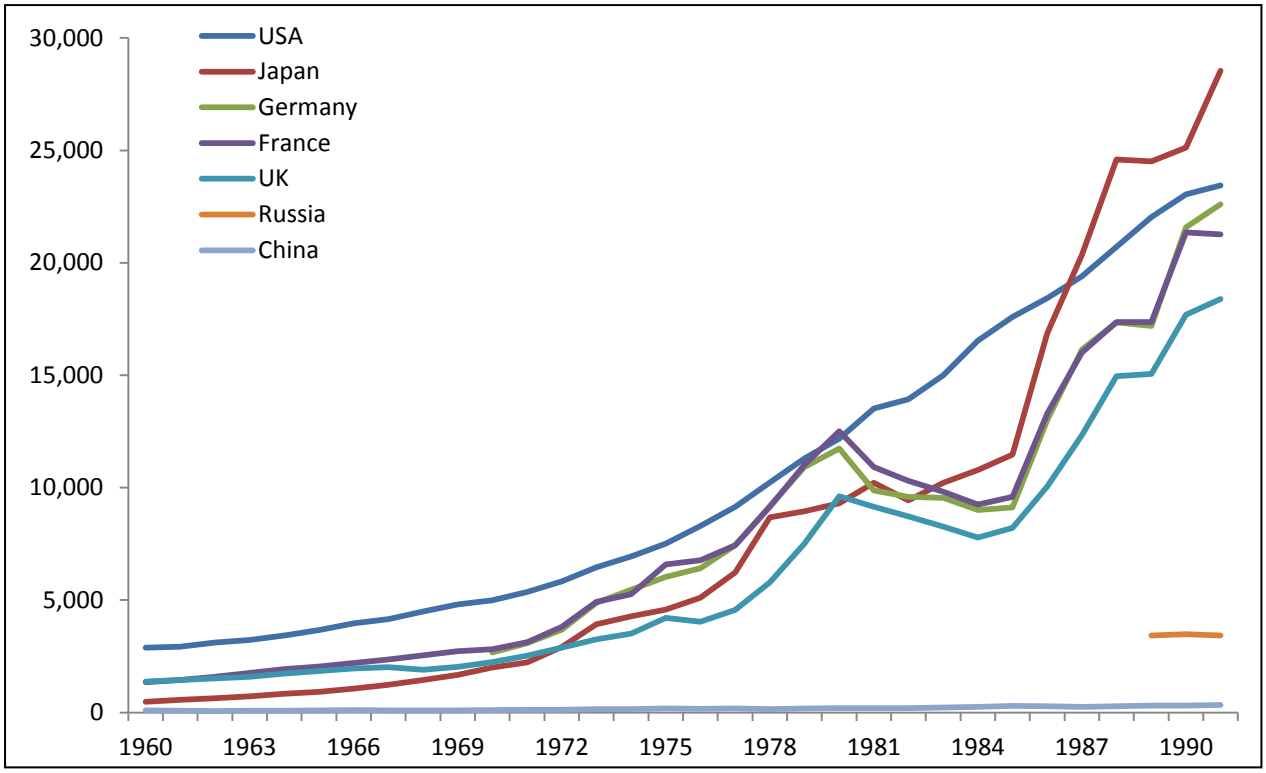
Source: Maddison (2003). Data is in 1990 US$ (Geary-Khamis PPP dollars).

PPP US dollars.[64] Figure 32, meanwhile, does the same thing for GDP per capita from 1960 to 1991 at market exchange rates.[65] And figure 33 displays the proportion of the PPP per capita GDP of the most developed start-of-period lead economy – the United States – represented by each of the major follower economies' own level of per capita development.[66] On both PPP and market exchange rate definitions of per capita GDP, the catch-up convergence growth experienced by the non-US G5 is plain to see (although, at least on a PPP basis, the United Kingdom experienced little catch-up after the initial post-war recovery period of 1945-50). By contrast, the Soviet Union's modest catch-up growth in the early Cold War – going from around 20 percent of US per capita GDP (by PPP) in 1946 to around 37 percent – went into reverse from the early 1970s, falling further behind its Western counterparts. Non-US G5 convergence certainly slowed after 1973 compared to the pre-oil

[64] (Maddison, 2003b)
[65] (Bank, 2012)
[66] My calculations, based on data in (Maddison, 2003b)

shock Golden Age, but it did not completely stop. Moreover, China stands out as a key state that experienced catch-up growth thanks to international economic flows in the later Cold War, specifically after the beginnings of Deng Xiaoping's Open Door Policy in 1978.[67] An extensive discussion is beyond the scope of this chapter, but the rise of China that took hold in the 1980s and accelerated from the 1990s is returned to in greater detail in Chapter VIII.

Figure 32. Major Powers' GDP per Capita (Market Exchange Rates), 1960-91, then-year US$

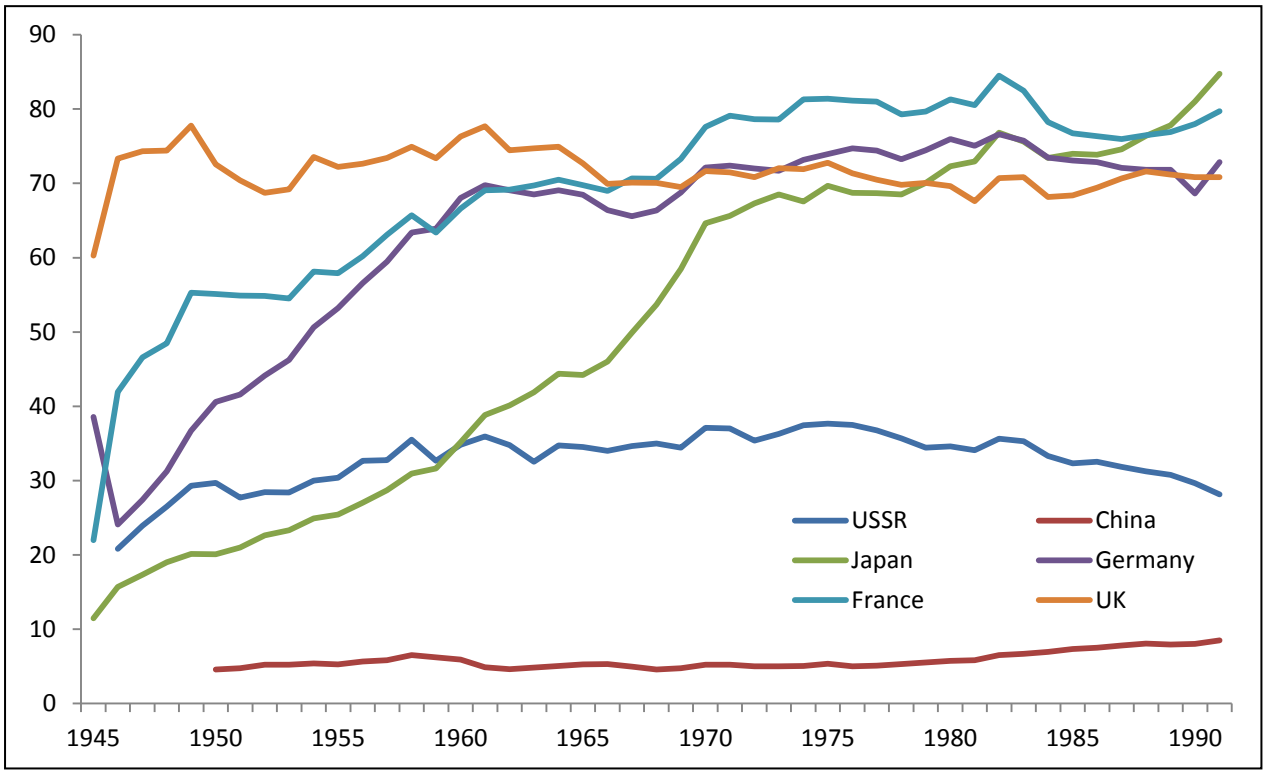


Source: World Bank World Development Indicators and Global Development Finance (2012). Data is US$ at then-year market rates.

Figure 34 puts these trends in regional perspective for the three principal growth epochs between 1870 and 1998.[68] Having been the strongest growing region during the 1870-1913 period, the 'Western Offshoots' – which includes the United States – were comprehensively outgrown by Western Europe, Japan, and to a lesser extent Eastern Europe – including the Soviet Union – during the 1950-73 Golden Age. After 1973, all three of the Western economic blocs posted similar growth rates, while 'Resurgent Asia' – which

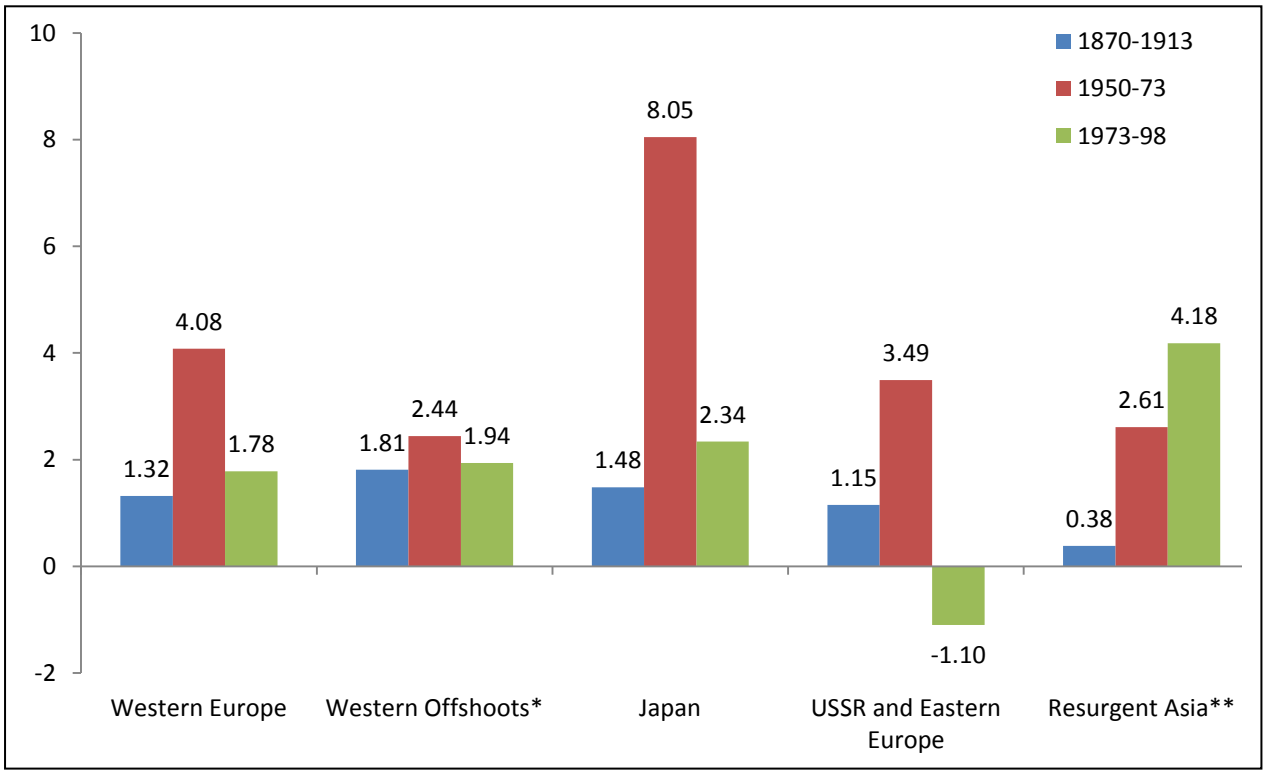
[67] (Zweig, 2002)
[68] (Maddison, 2003b)

Figure 33. Follower Powers' GDP per Capita, 1945-91, % of US GDP per capita (PPP)



Source: My calculations, using data in Maddison (2003). Data reflects 1990 US$ (Geary-Khamis PPP dollars).

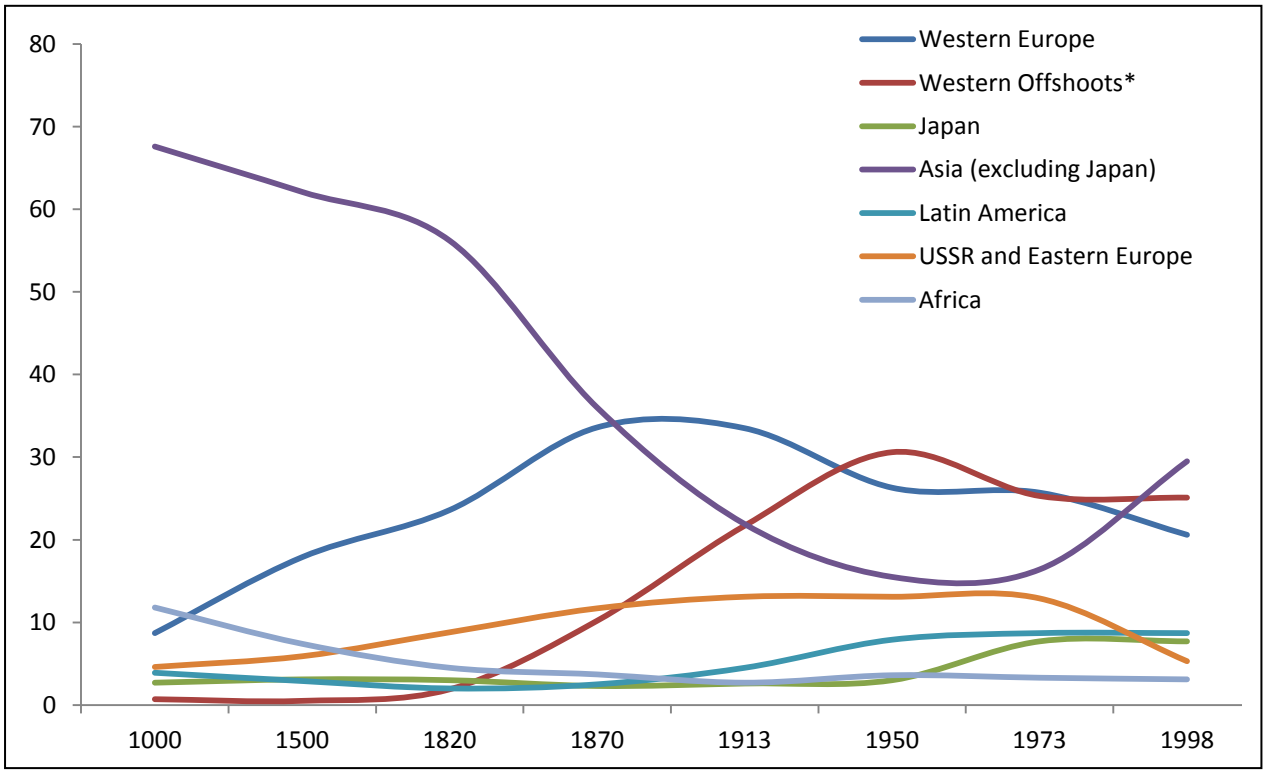
Figure 34. Regional GDP Growth in the Three Most Dynamic Capitalist Epochs, %



Source: Maddison (2003). Data is annual average compound growth rate for each epoch. *USA, Canada, Australia, and New Zealand. **China, Korea, South and Southeast Asia.

includes China – accelerated to post the strongest growth of the major blocs and the Eastern European economy actually contracted by an average of more than one percent per year. The results of these differential growth rates for overall regional shares of global GDP over the entire second millennium are shown by figure 35.[69] Salient features include Western Europe's brief recovery to parity with the Western Offshoots by the 1970s following its fall behind during the period between the outbreak of World War I and the end of World War II, Japan's rise from its post-World War II devastation to have a GDP approximately double that of the whole of Africa and close to that of the whole of Latin America, non-Japanese Asia's dip to its lowest share of world GDP since the year 1000 by the mid-twentieth century followed by improving fortunes by the 1990s, and Eastern Europe's remarkable crash between 1973 and 1998.

Figure 35. Regional Shares of World GDP, 1000-1998, %



Source: Maddison (2003). Data reflects 1990 US$ GDP of each region (Geary-Khamis PPP dollars). *USA, Canada, Australia, and New Zealand.

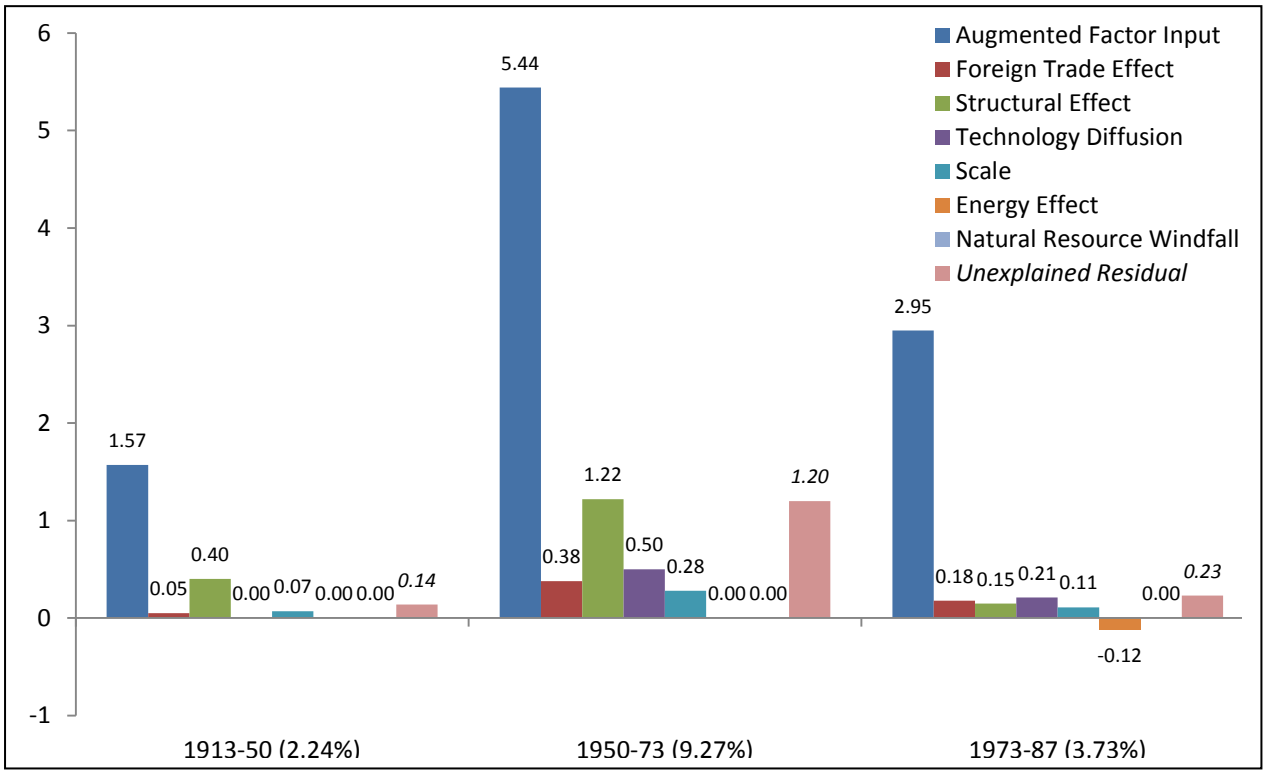
[69] (Maddison, 2003b)

In a similar fashion to the component breakdown of productivity growth drivers shown in figure 24, figures 36a to 36e show the constituent component drivers of the G5 economies' GDP growth during the 1913-50, 1950-73, and 1973-87 periods.[70] In all five countries, the principal driver of growth in all three periods has been improvements in total augmented factor input – and as noted earlier, cross-border flows can certainly contribute to such input factor growth and improvement. Crucially, however, the key difference between the US lead economy – which actually posted augmented factor input growth superior to that seen in Europe during the 1950-87 period – and the four G5 follower economies is that, particularly during the 1950-73 Golden Age of convergence, the follower economies outstripped the United States across a range of other drivers of growth. And of these, the foreign trade effect, the structural shift effect, technology diffusion, and the scale benefits of accessing a larger market (which for smaller domestic economies is best achieved through international commerce) are all significant consequences of deepening economic integration and lead-economy diffusion, such as is central to this dissertation's theory and as was demonstrated to have occurred during this period earlier in the chapter. Even the unexplained growth residual, insofar as much of this comes down to hard-to-precisely-measure TFP improvements, fits with the wider benefits of international commerce documented throughout. Accordingly, there is compelling evidence that much of the catch-up growth seen in this period can be attributed to international flows and the consequences of openness.

What impact did the rapid development of the Golden Age and 1980s have on the major economies' economic structure? As noted when discussing productivity and GDP growth, economic structural shifts were key contributors to growth, meaning that development and structural shift is clearly a two-way, mutually-reinforcing process. Figure 37 provides a first insight into the demise of agriculture as a share of the major Western

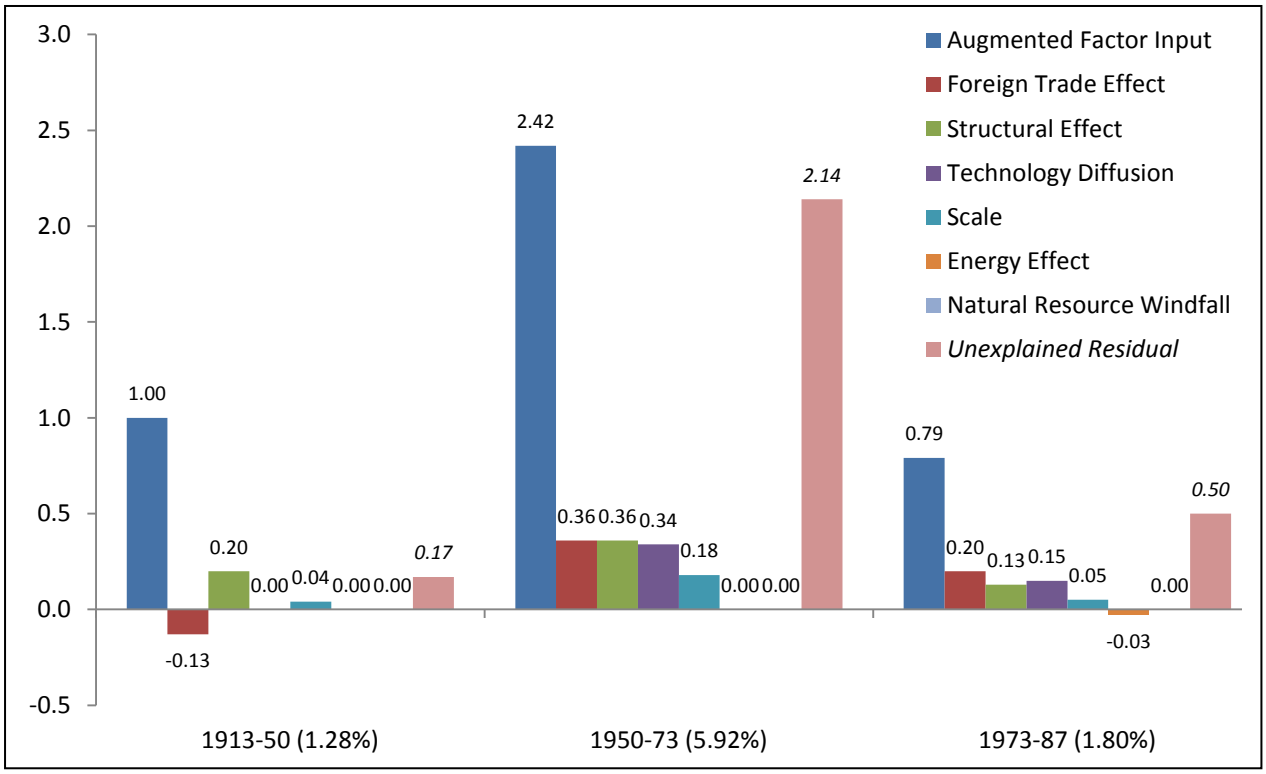
[70] (Maddison, 1991, p. 158)

Figure 36a. Japan: Identifiable Forces Explaining GDP Growth, 1913-87, % contribution



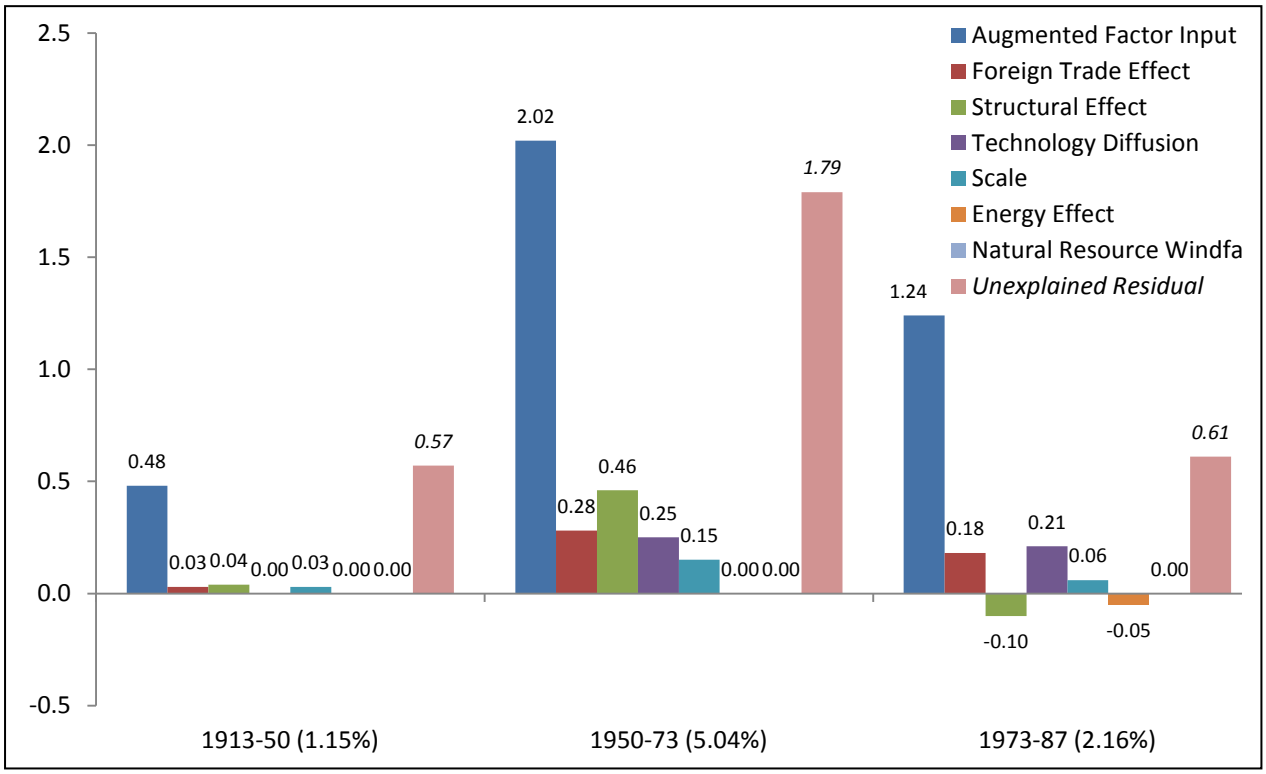
Source: Maddison (1991), p. 158. Data represents contribution of each factor to annual average compound GDP growth rate (see parentheses on horizontal axis) in each epoch.

Figure 36b. Germany: Identifiable Forces Explaining GDP Growth, 1913-87, % contribution



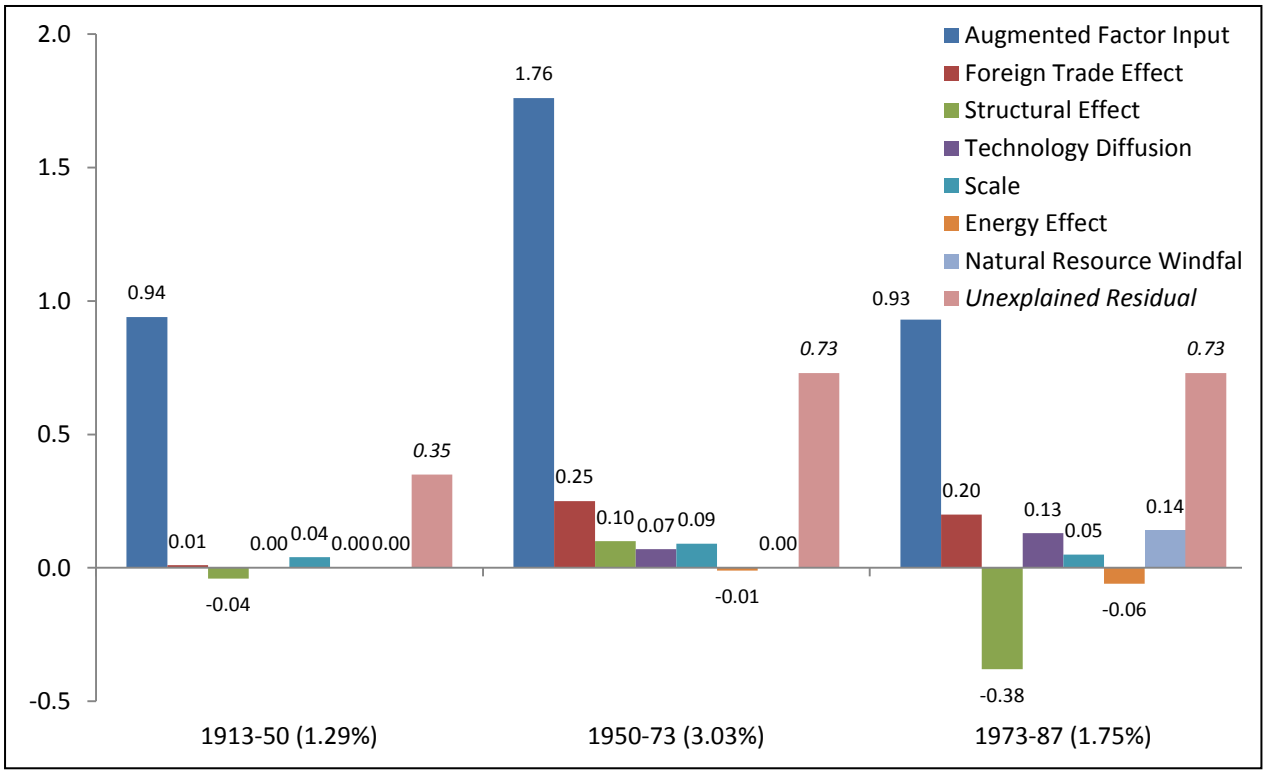
Source: Maddison (1991), p. 158. Data represents contribution of each factor to annual average compound GDP growth rate (see parentheses on horizontal axis) in each epoch.

Figure 36c. France: Identifiable Forces Explaining GDP Growth, 1913-87, % contribution



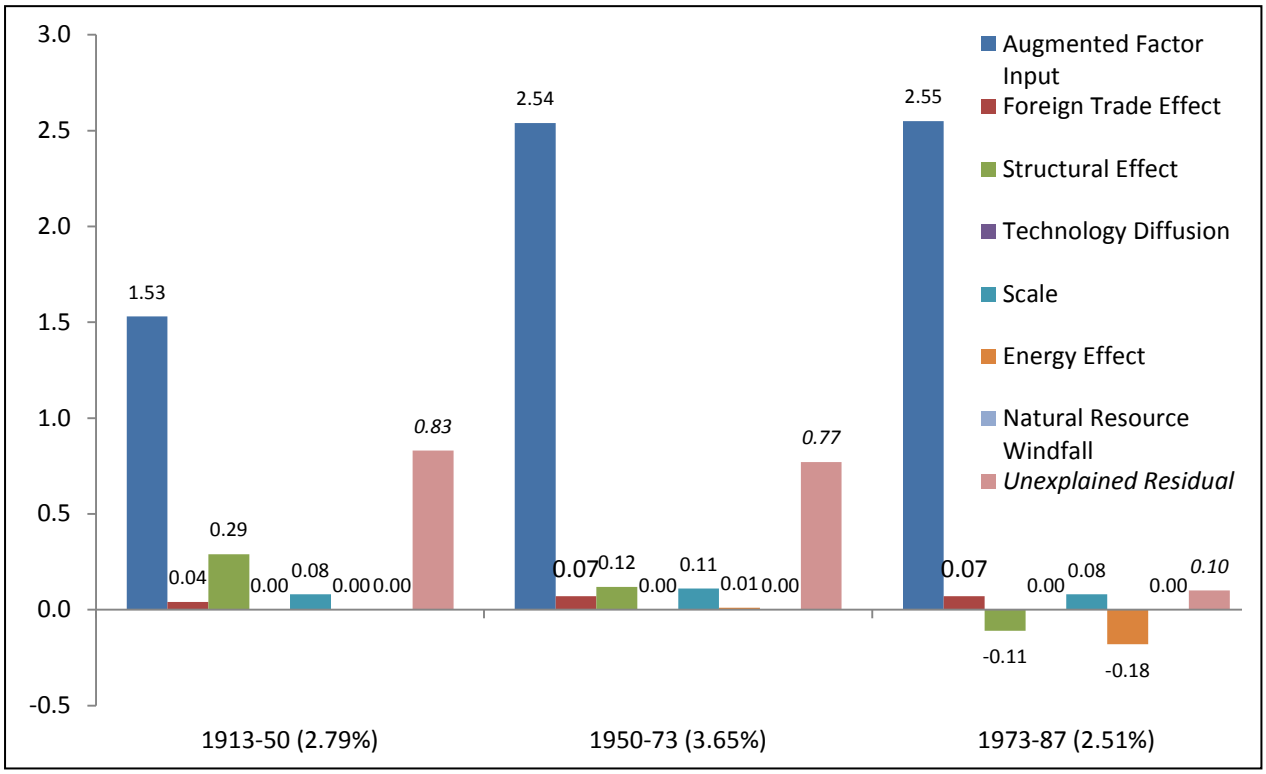
Source: Maddison (1991), p. 158. Data represents contribution of each factor to annual average compound GDP growth rate (see parentheses on horizontal axis) in each epoch.

Figure 36d. UK: Identifiable Forces Explaining GDP Growth, 1913-87, % contribution



Source: Maddison (1991), p. 158. Data represents contribution of each factor to annual average compound GDP growth rate (see parentheses on horizontal axis) in each epoch.

Figure 36e. USA: Identifiable Forces Explaining GDP Growth, 1913-87, % contribution



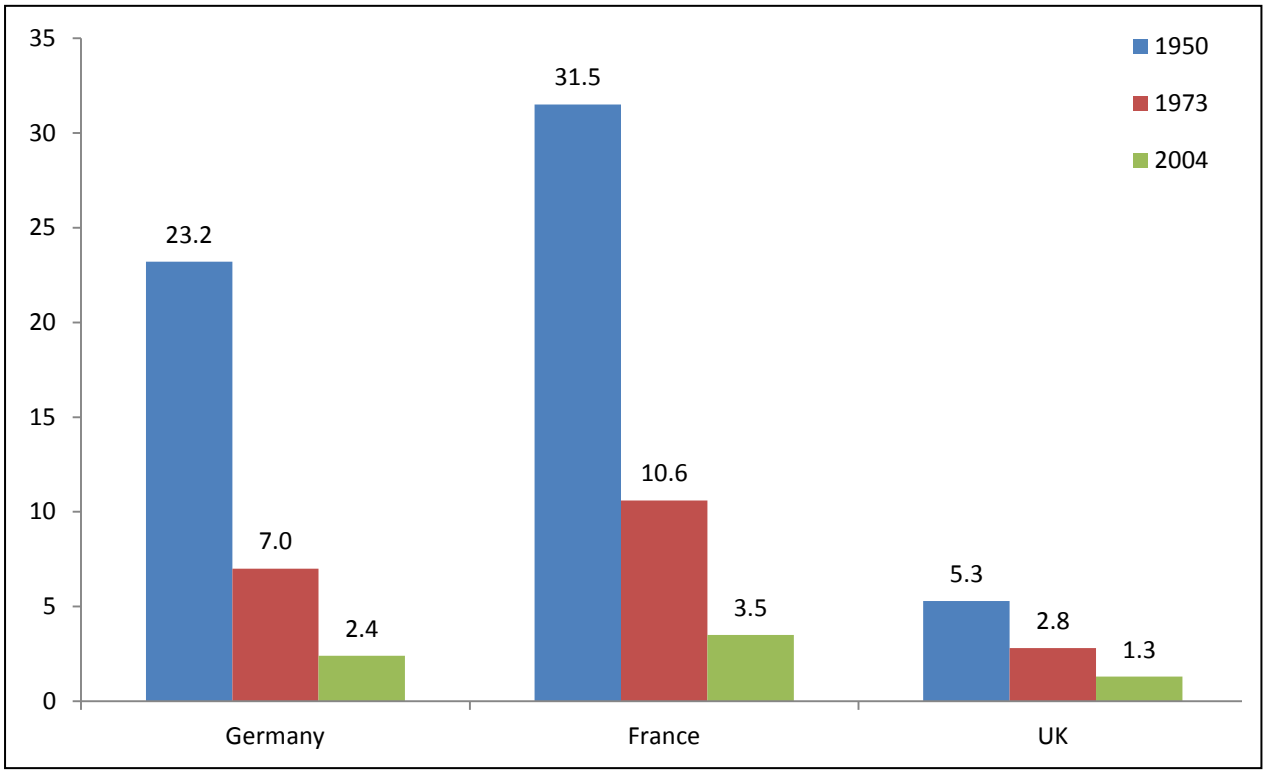
Source: Maddison (1991), p. 158. Data represents contribution of each factor to annual average compound GDP growth rate (see parentheses on horizontal axis) in each epoch.

European economies' employment in the half-century following 1950. The French and German shift out of a comparatively low-productivity sector is particularly pronounced; UK industrialisation, by contrast, had already resulted in most Brits leaving the fields before 1950.[71] Figure 38, meanwhile, shows the contribution of agriculture to GDP for all of the major economies over the last two decades of the Cold War.[72] There were important differences among the advanced Western economies, to be sure: Japan's 5.1 percent share for agriculture in GDP as of 1970 was nearly double the United Kingdom's 2.9 percent, while France's 8.1 percent was going on for three times the UK share. Nonetheless, for all of the G5 economies – even the geographically vast United States – agriculture was a small and declining contributor to national output throughout the 1970-91 period. By contrast, agriculture accounted for more than a third of Chinese output in 1970 and still more than a

[71] (Crafts & Toniolo, 2010, pp. 316-317)
[72] (Bank, 2012)

quarter in 1990, while it also represented 16.6 percent of Russian output in that same year (Russian data was unfortunately not available for the years prior to that), belying both countries' position outside the advanced industrialised group.

Figure 37. Agriculture as a Share of Employment in the EU3, 1950-2004, % of labour force

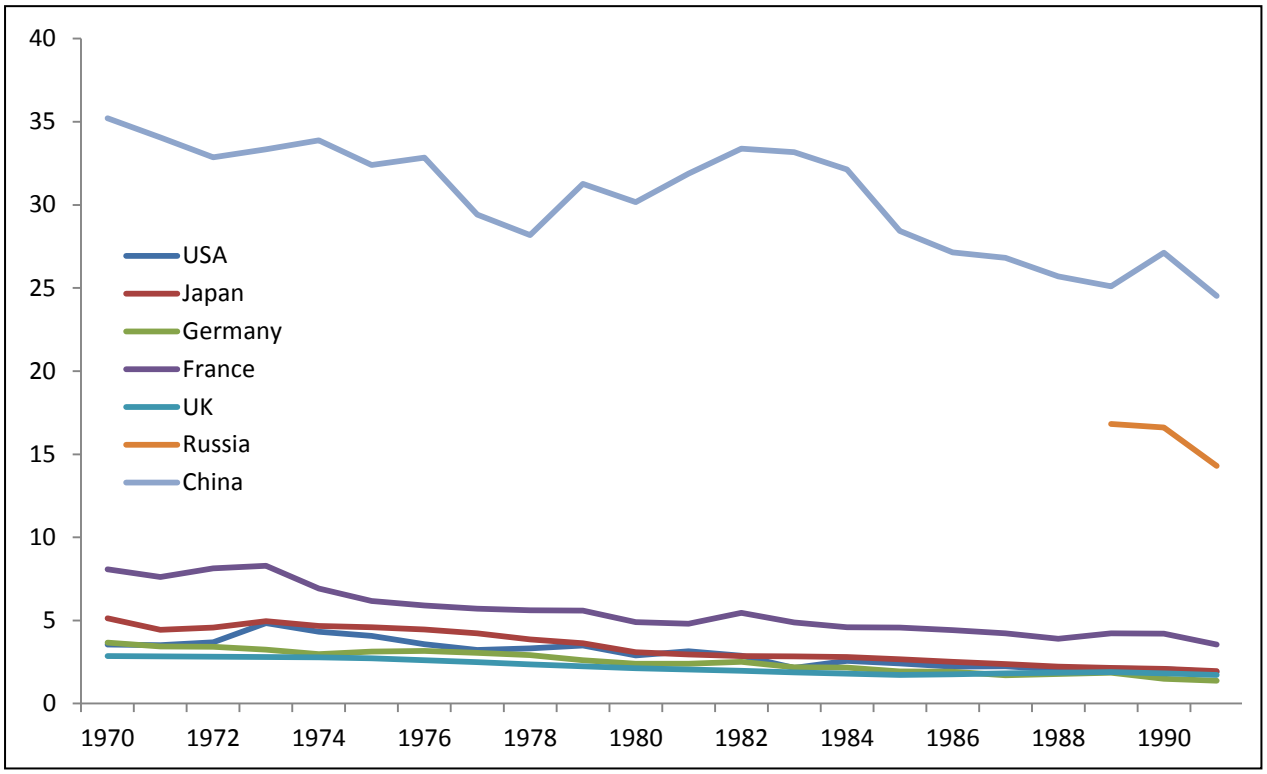


Source: Crafts and Toniolo (2010), pp. 316-17.

So much for the demise of agriculture; what was the fate of manufacturing? Again, figure 39 provides an informative take on the employment share of industry in the major Western European economies between 1950 and 2004.[73] An interesting pattern emerges here: industry grew as a share of employment between 1950 and 1973 in France and Germany, before reversing course in the final quarter of the twentieth century. The United Kingdom, by contrast, experienced the same process of deindustrialisation – at least in terms of employment share – displayed by its continental peers post-1973 throughout the latter half of the twentieth century. A similar pattern is evident in data on the share of manufacturing in

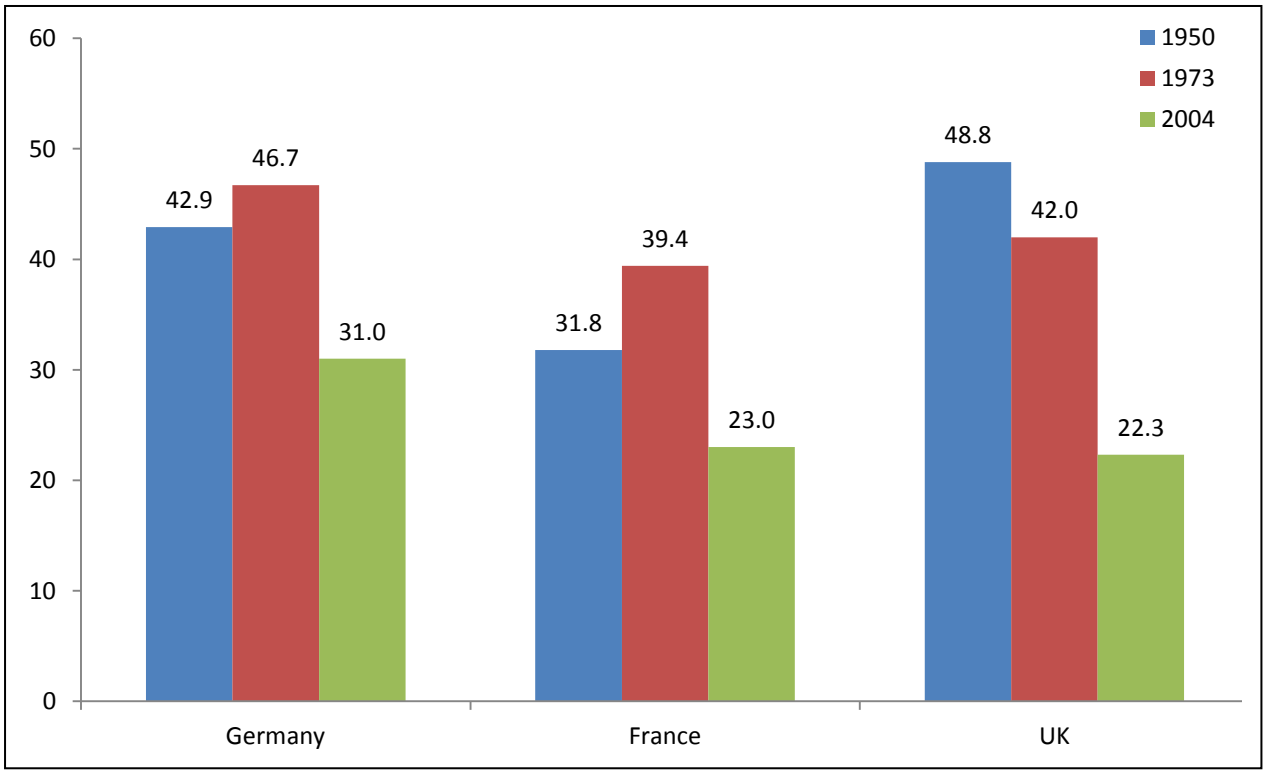
[73] (Crafts & Toniolo, 2010, pp. 316-317)

Figure 38. Agriculture's Contribution to Major Power GDP, 1970-91, %



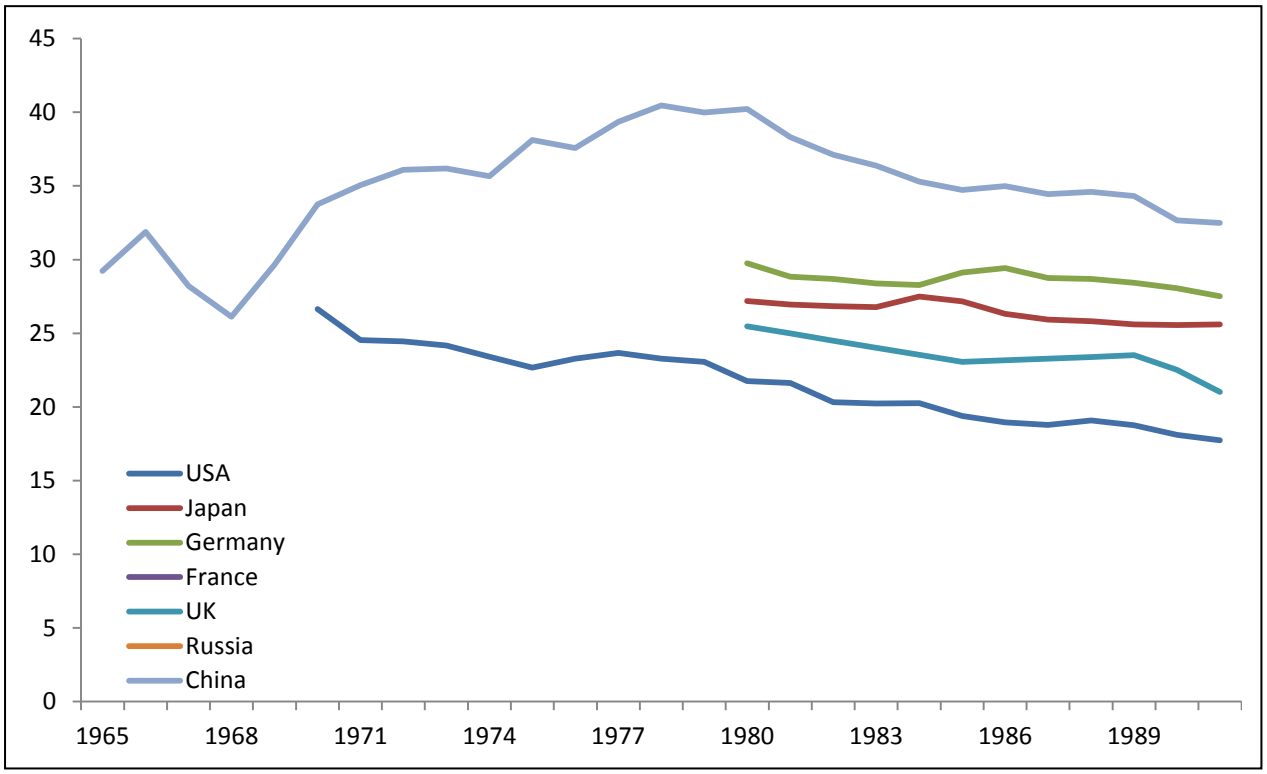
Source: World Bank World Development Indicators and Global Development Finance (2012). Data is for GDP in then-year US$.

Figure 39. Industry as a Share of Employment in the EU3, 1950-2004, % of labour force



Source: Crafts and Toniolo (2010), pp. 316-17.

Figure 40. Manufacturing's Contribution to Major Power GDP, 1970-91, %



Source: World Bank World Development Indicators and Global Development Finance (2012). Data is for GDP in then-year US$.

major power GDP from 1965 (figure 40).[74] The post-1970 deindustrialisation suggested by Western European employment data is mirrored by the United States and Japan, with the former having the lowest manufacturing share of all of the major economies (although given total US GDP, the US manufacturing sector remained the world's largest). This data series unfortunately does not contain data for Russia prior to 2002, rendering it of little use for a discussion of even the late stages of the Cold War, but given the Soviet Union's industry-focused economic structure, it seems plausible to suppose that manufacturing's share of GDP would be higher than the Chinese curve displayed in figure 40.

Given that both agriculture *and* manufacturing represented a reduced share of all G5 economies' employment *and* output by the end of the Cold War compared to beginning, which sectors grew in their place? Figure 41 – while unfortunately only having access to

[74] (Bank, 2012)

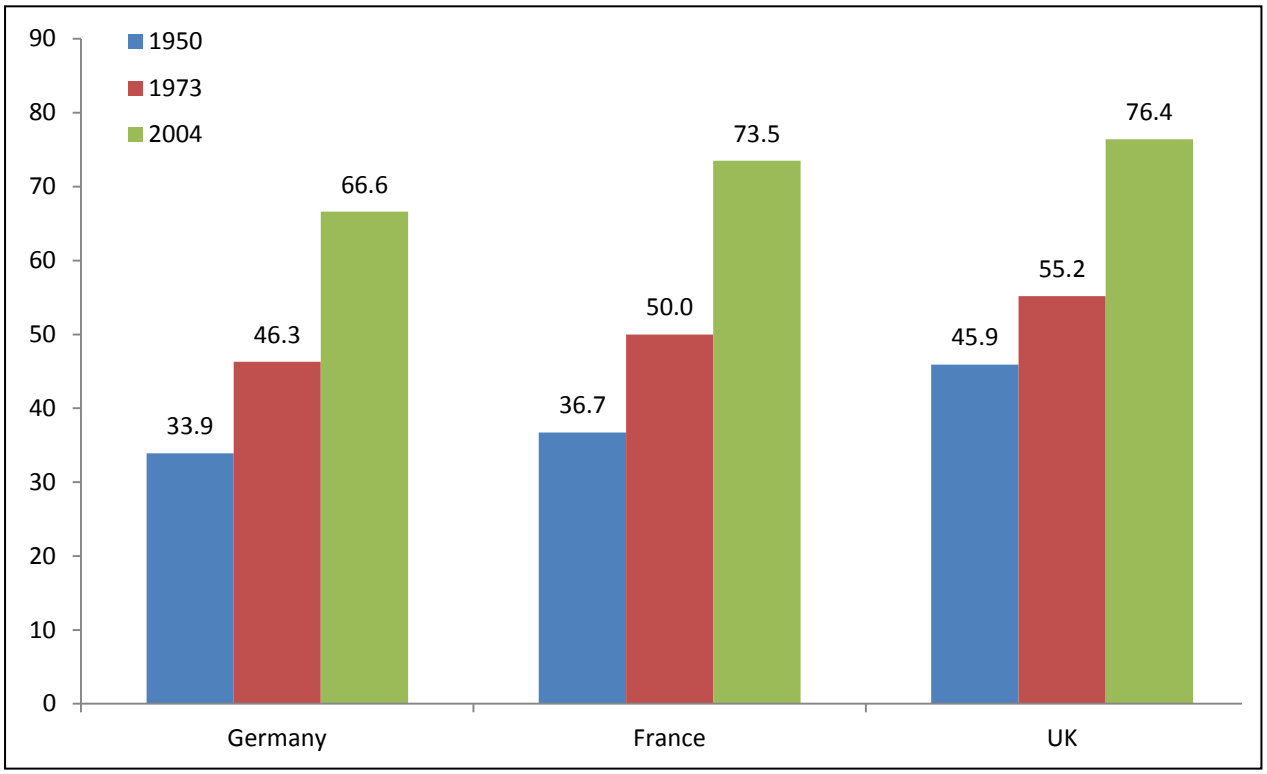
Western European data – provides an answer.[75] As lower productivity sectors – such as bulk manufacturing and agriculture – declined in the advanced Western economies, an educated labour force increasingly moved into services. Of course, many service sector jobs – table waiting and cleaning, for instance – are no more marginally productive than roles in agriculture or low-tech manufacturing. But others, such as legal services, accountancy, insurance, information technology and communications, financial advising, banking, advertising and public relations, publishing and the media, consulting, research, teaching and education, and so forth, offered substantially higher economic output from an educated-but-scarce labour force compared to keeping a comparable number of workers in factories or on farms. The availability of lower-end manufactured goods and industrial inputs in the cheaper labour economies of non-Japanese Asia facilitated this shift. In short, by the final quarter of the twentieth century, the developed Western economies were beginning to resemble their contemporary, IT-enabled, service-based, post-industrial selves, coupled to a reduced-but-enduring role for the most advanced and sophisticated manufacturing (particularly in Germany and Japan). This was the sort of knowledge-based economic model that a command economy set up for heavy industry, with lower average worker skills and strict controls on the exchange of information – such as the Soviet Union – could never hope to emulate.

As a final point in this section, it is worth considering other aspects of economic development that occurred during the Cold War period. First, at the same time that the Soviet economy was stagnating and sliding towards its eventual crisis in the 1980s, the stability of Western aggregate demand was continuing to improve.[76] While it has been popular in the wake of the 2008-9 financial crisis and ensuing global recession to mock the UK government's earlier claim to have abolished the worst excesses of the business cycle,[77] comparative data for the 1950-73, 1974-93, and 1994-2007 periods does suggest that they

[75] (Crafts & Toniolo, 2010, pp. 316-317)
[76] (Battilossi, Foreman-Peck, & Kling, 2010, p. 371)
[77] (Rawnsley, 19 October 2008)

had justification for their claim: cyclical output volatility did decline continuously over this 67-year period, as recessions became progressively more mild. Second, as a corollary to the reduction in the economic role of heavy industry and the switch towards more advanced services and manufacturing, the energy efficiency of all of the major economies – but most especially the non-US G5 – improved from 1980 onwards, when data begins. The one exception, predictably, was the dying Soviet Union during the 1989-91 period for which there is Russian data.[78]

Figure 41. Services as a Share of Employment in the EU3, 1950-2004, % of labour force



Source: Crafts and Toniolo (2010), pp. 316-17.

A third indicator of economic development – albeit not one necessarily synonymous with improving quality of life – is the increasing urbanisation of the major economies' populations between 1960 and the 1990s.[79] On this metric, interestingly, the Soviet Union – at least by the latter years of the Cold War – does not noticeably lag the G5; indeed, Soviet

[78] (Bank, 2012)
[79] (Bank, 2012)

urbanisation outstripped its Japanese equivalent throughout the period in question. That said, the observed convergence of France and Japan towards the urbanisation levels of the United States and Germany – the high population density United Kingdom already being even more urbanised than them – may reflect a different trend to the superficially similar Soviet result, insofar as it was a symptom of an increasingly advanced economy for the G5 but potentially a product of mounting shortages and an inability of the command economy to provide for the rural periphery in the Soviet case.

The G5 and Soviet Union Compared

As the array of growth data presented above makes clear, the 1950-1989 period – particularly the half of that period prior to the 1973 oil shock – saw the other major Western economies converge towards the productivity and development levels of the lead economy, the United States. And as demonstrated throughout, many of the flows associated with the deepening economic integration of the period – most notably capital and technology diffusion – contributed substantively to that catch-up growth. Meanwhile, as figures 28, 29, 31, and 33 make clear, the Soviet Union also experienced growth during the first two decades of the Cold War that – while not equal to that of Japan or Germany – nevertheless outstripped that of the United States. Tying back to discussion earlier in the chapter, this is consistent with the large-scale capital and technology transfers made to the Soviet Union before, during, and immediately after World War II – although of course, the domestic reconstruction and industrialisation process must bear a large share of the credit. Crucially, however, by the 1970s, Soviet closure to the sorts of goods and capital flows that were enriching the Western economies – along with a rigidly planned domestic economic model – meant that its growth weakened in comparison to its Western competitors, with relative economic decline the inevitable consequence. Despite extensive domestic R&D efforts, pockets of excellence in

certain sectors (most notably those with military applications), and a major programme of industrial espionage, Soviet development was simply not sufficient to keep pace with the gains that the major Western economies were reaping from free exchange.

Accordingly, the major economies' growth experiences in this period are wholly consistent with the theory presented in this dissertation. During the most significant period of deepening economic re-integration – the 1950-73 Golden Age – the Western follower economies grew rapidly and converged on the development level of the start-of-period lead economy. And even after the 1973 oil shock, the non-US G5 continued – with the exception of the United Kingdom – to post stronger average annual growth than the United States. By contrast, the one major economy that was comparatively closed to such economic exchange – as a consequence of both its own policy choices and those of its peers – experienced strong early growth as a result of heavy domestic capital investment, war reconstruction, and prior capital and technology transfers, but then suffered predictably from the absence of capital and technology flows, particularly by the 1980s when economic strength had become less about iron output and more about IT and electronics.

Power Shifts in the Cold War

In light of the differential growth rates described above, the chapter now turns to a discussion of shifts in national power that occurred during the Cold War: both the underlying economic aggregates, and the military capability that such economic aggregates supported. The focus is on examining to what extent there were or were not significant power shifts between the end of World War II and the final demise of the Soviet Union.

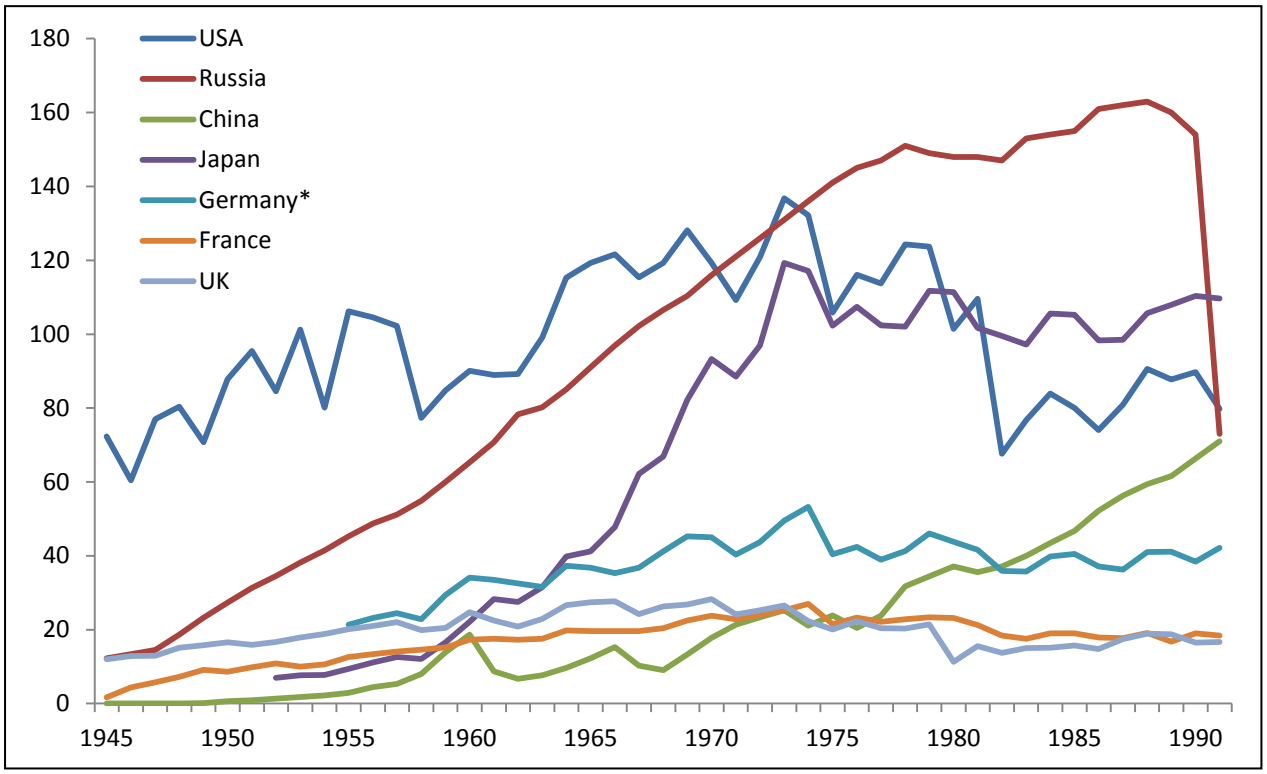
GDP and the Declining Relevance of Industrial Aggregates

Following from the conclusion of the previous section, figure 42 provides data on the iron and steel output of the major economies throughout the Cold War; figure 43, meanwhile, provides data on the energy usage of those same economies.[80] The apparent picture conveyed by these charts is that, on 'old-fashioned,' pre-1950 metrics of national economic power, such as were most relevant during the 1870-1945 era of European great power competition – the real focus of the Correlates of War programme's National Material Capabilities dataset – the Soviet Union simply got more and more powerful until its economic crisis in the late 1980s and eventual termination in 1991. Indeed, using iron and steel output as a metric of economic wherewithal would suggest that the United States was only just the economic equal of China and substantially weaker than Japan by the end of the 1980s – an absurdity. The reality that these charts reflect, therefore, is twofold. First, in the pre-1970 period, the Soviet Union's healthy growth described above was manifested as huge strides in heavy industrial production. Second, however, by the latter two decades of the Cold War – and particularly the 1980s – such heavy industrial production was of declining relevance to national economic power. An economy as rich as the United States might be producing less of its own iron and steel, but these could be purchased more cheaply on international markets from then-emerging economies such as South Korea anyway. Meanwhile, Western economic capacity was switching to higher productivity sectors.

Such an argument is borne-out by the total national economic output data contained in figures 44 (GDP at purchasing power parity)[81] and 45 (GDP at market exchange rates).[82] On both PPP and market exchange bases, the only country posting sufficiently superior growth to

[80] Correlates of War National Material Capabilities Dataset, Version 4.0; accessed online on 15 February 2011 at http://www.correlatesofwar.org/COW2%20Data/Capabilities/NMC_v4_0.csv. For guidance on the composition and reliability of the Index, see the accompanying Version 4.0 Codebook, accessed on 15 February 2011 at http://www.correlatesofwar.org/COW2%20Data/Capabilities/NMC_Codebook_v4_0.pdf. See also: (Singer, May 1988; Singer et al., 1972)
[81] (Maddison, 2003b)

Figure 42. Iron and Steel Output of the Major Powers, 1945-91, million tons



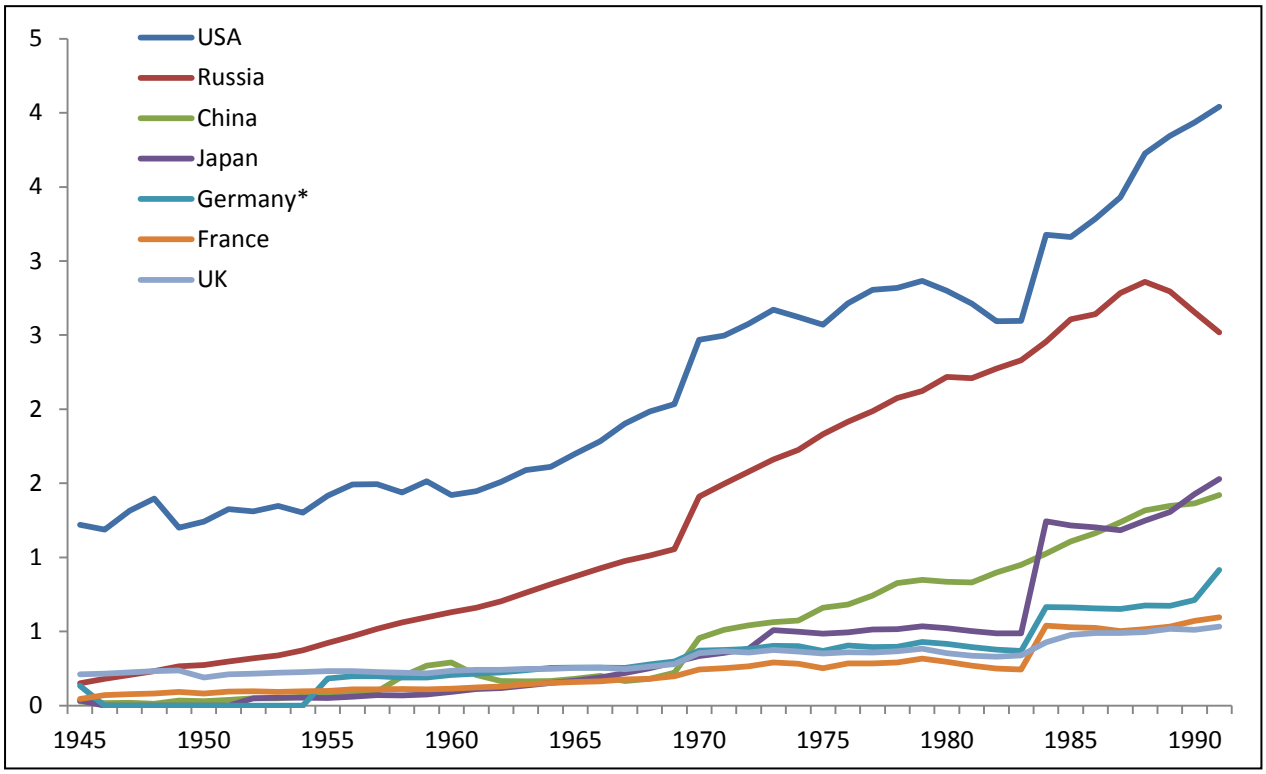
Source: Correlates of War: National Material Capabilities, Version 4.0. *Federal Republic (West Germany) from 1955 to 1990; unified Germany at other periods.

close in on total US output levels throughout the 1945-89 period was Japan, with the Soviet Union falling behind even as it was producing internationally unprecedented quantities of iron and steel. Meanwhile, on a market exchange rate basis – the most significant metric in terms of an ability to purchase goods, including the most advanced technologies, from international markets – Russian GDP by 1989 was less than two-thirds of the size of even the smallest G5 economy, the United Kingdom.

A full sense of these trends is given by figure 46.[83] The catch-up growth of the non-US G5 from the end of World War II until the early 1970s is visible as an increase in their PPP economic size relative to the United States (excluding the United Kingdom). From the 1970s, however, Japan and China were the only such follower economies posting sufficiently superior growth to continue to converge on overall US PPP GDP – and even then, Japan had

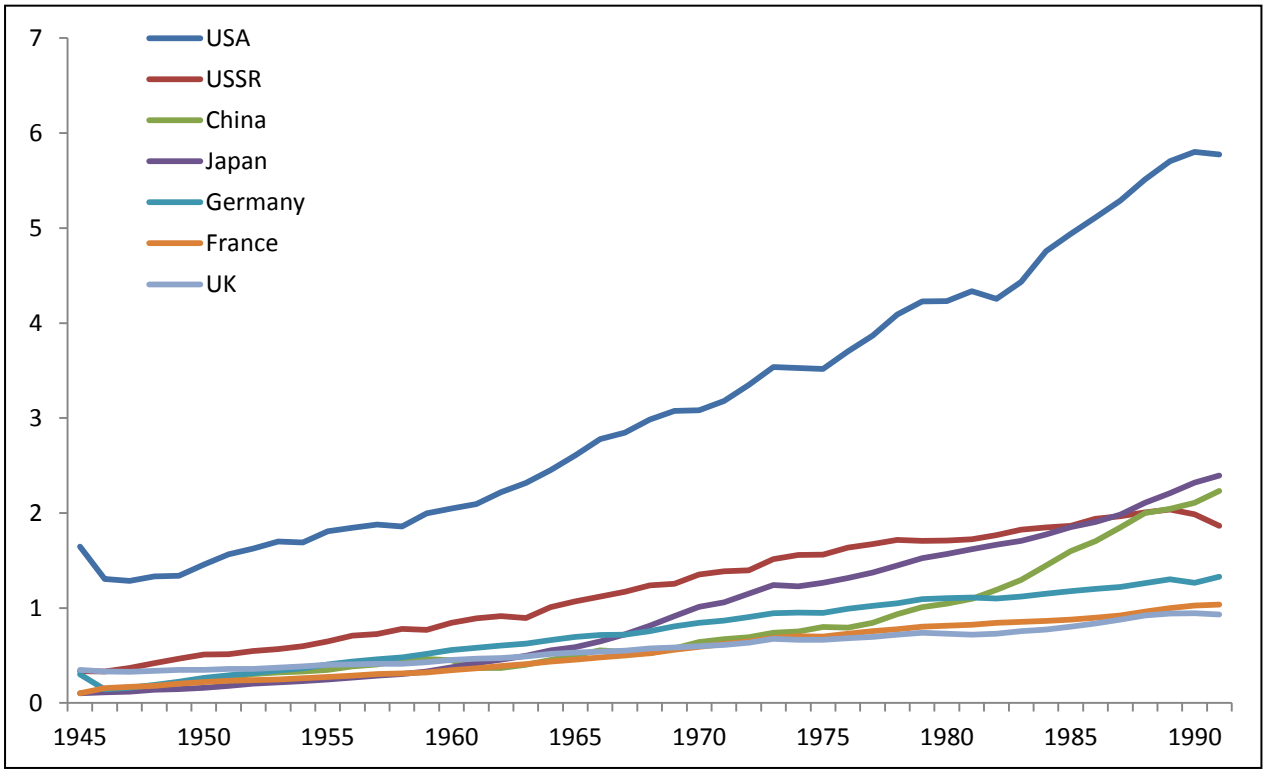
[82] (Bank, 2012)
[83] My calculations, based on data in (Maddison, 2003b)

Figure 43. Energy Consumption in the Major Powers, 1945-91, million coal-ton equivalents



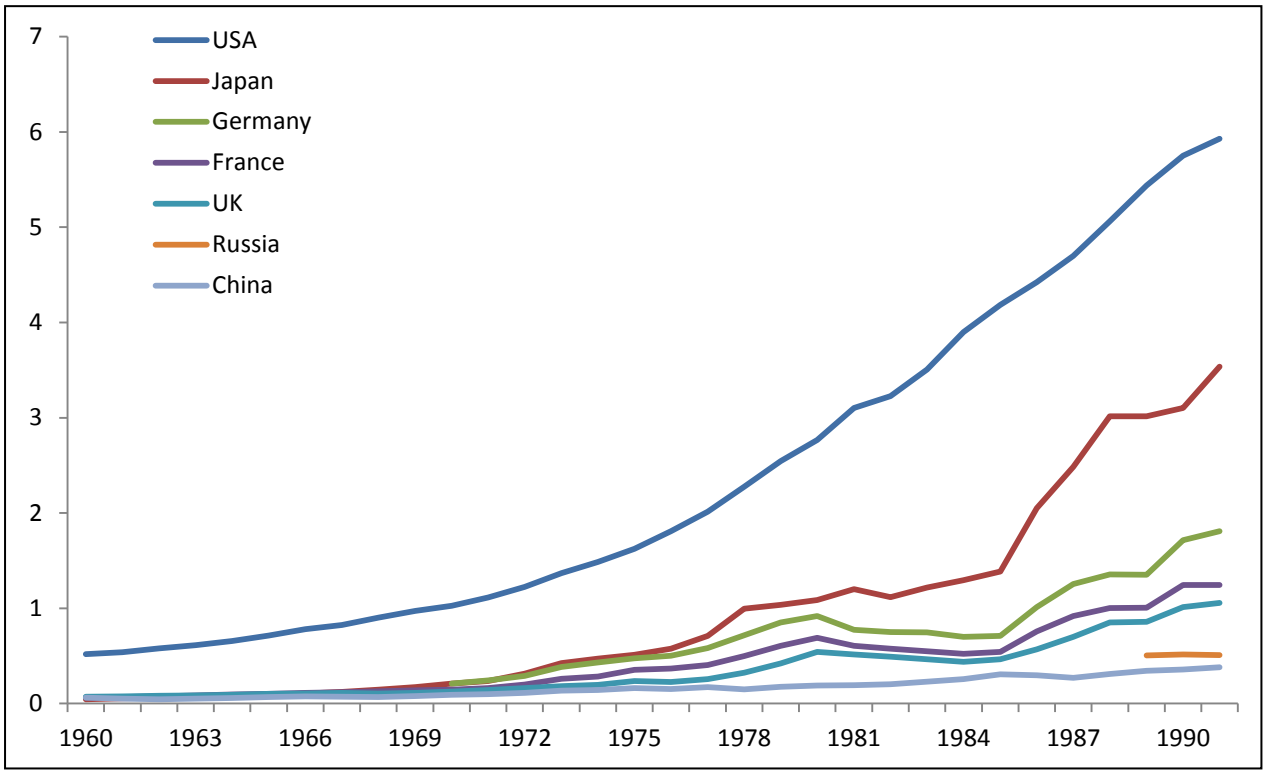
Source: Correlates of War: National Material Capabilities, Version 4.0. *Federal Republic (West Germany) from 1955 to 1990; unified Germany at other periods.

Figure 44. Major Powers' GDP (Purchasing Power Parity), 1945-91, 1990 US$



Source: Maddison (2003). Data is in 1990 US$ (Geary-Khamis PPP dollars).

Figure 45. Major Powers' GDP (Market Exchange Rates), 1960-91, then-year US$



Source: World Bank World Development Indicators and Global Development Finance (2012. Data is US$ at then-year market rates.

only attained in the region of 40 percent of US PPP GDP by the early 1990s (of course, it was bigger than that on the basis of market exchange rate GDP). Meanwhile, the Soviet Union also posted an increase in its economic size relative to the United States until the early 1970s – but even then its peak was only around 44 percent of the US figure – and went into rapid relative decline thereafter. Moreover, the PPP figure is actually the most flattering to the Soviet and Chinese economies. In short, the Soviet Union was certainly producing the most iron and steel of all of the major powers by the latter Cold War, but that was more a symptom of economic weakness – the most advanced economies were getting out of such low-tech industry – than a sign of great industrial prowess.

What do the patterns outlined above mean in balance-of-power terms? Quite simply, no other great power significantly rivalled the United States throughout the Cold War – at least not in terms of underlying economic resources. The Soviet Union earned superpower

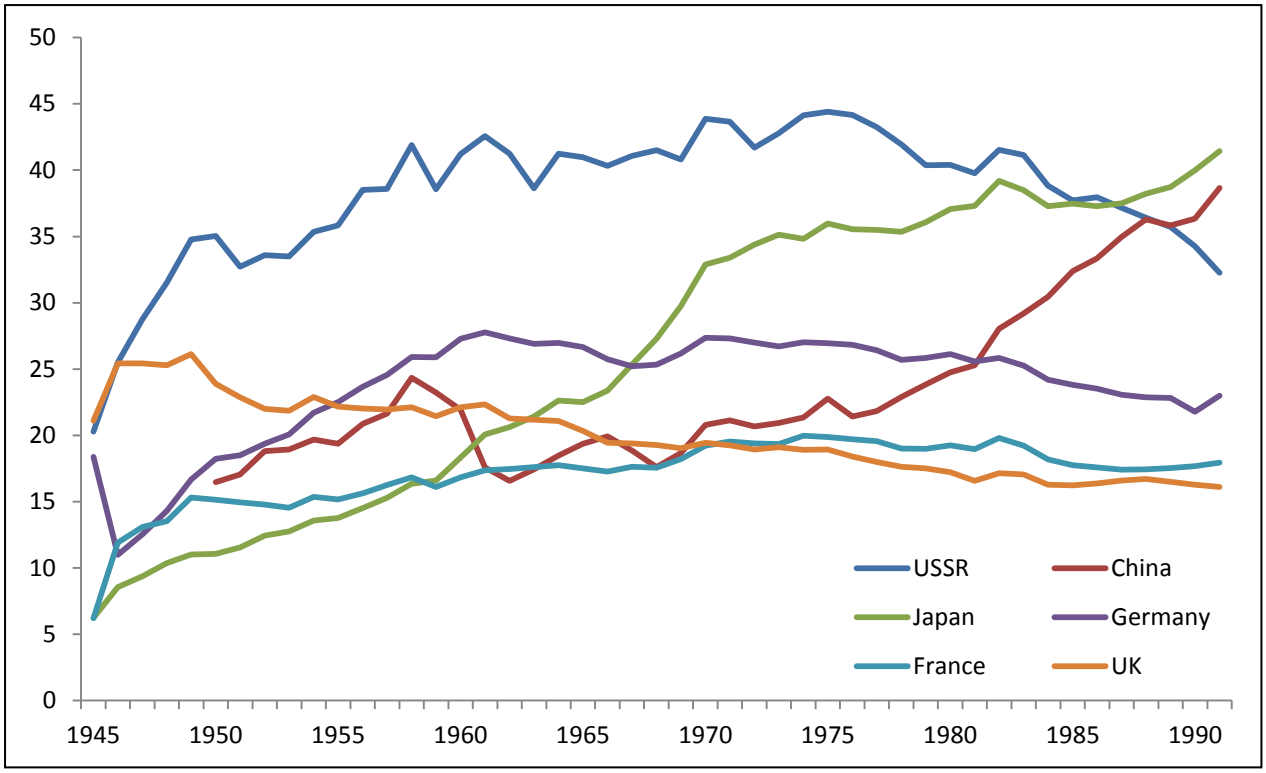
status through its large defence expenditures, which in turn supplied a sufficiently large nuclear arsenal and conventional forces to be of consequence to the global military balance and a serious threat to Western Europe, but its economic base never came close to that of the United States – and by the 1980s, the Soviet economy was falling behind those of even second-tier Western powers. The same goes, to an extent, for the non-US G5 powers: they may have experienced catch-up growth, but never had the underlying potential to seriously rival the United States (as figure 48, discussed below, makes clear) – and the Soviet threat remained more salient geopolitically for the non-US G5 than the potential threat posed by US power, creating a compelling balancing incentive to sustain allied intra-Western relations.[84] That said, there were important dynamic shifts within this period: any Western planner in the early Cold War making a linear projection from the Soviet Union's 1945-60 growth performance would have significant grounds for concern, as indeed would a US planner by the late 1980s looking at Japan's performance since the end of World War II. Likewise, by the mid-1980s, a Soviet planner looking at the USSR's post-1970 economic record – even against the second-tier Western powers, most notably Germany in the European context, let alone the United States – would have real grounds for worry: justifiably, as it turned out.

The true scale of Soviet economic weakness relative to the Western alliance is made clear by figure 47, which shows just how much smaller the Soviet economy was than the combined economies of the United States' four principal Western allies – Japan, West Germany, France, and the United Kingdom – with each bloc's PPP GDP presented as a proportion of US PPP GDP at that time.[85] Interestingly, moreover, as the horizontal curves and the date lines added to figure 47 make clear, the years of détente – the Cold War's 1971-

[84] In particular, the presence of oceanic barriers – the 'stopping power of water' – diminished the potential threat posed by the United States, just as it had done prior to 1914, making the Soviet Union the most *salient* threat To Western Europe, despite its lesser economic potential: (Blagden et al., Fall 2011, pp. 195-196; Mearsheimer, 2001, pp. 114-128, 234-266; Walt, Spring 1985)
[85] My calculations, based on data in (Maddison, 2003b)

80 period of comparatively more cooperative and amicable superpower relations[86] – coincides with the period of a comparatively stable economic power balance, after Soviet GDP had stopped increasing relative to the United States but also before it went into terminal relative decline. Fully investigating causation here would represent a major research project in its own right, but figure 47 provides a noteworthy first demonstration of congruence.

Figure 46. Follower Major Powers' GDP (PPP), % of US GDP



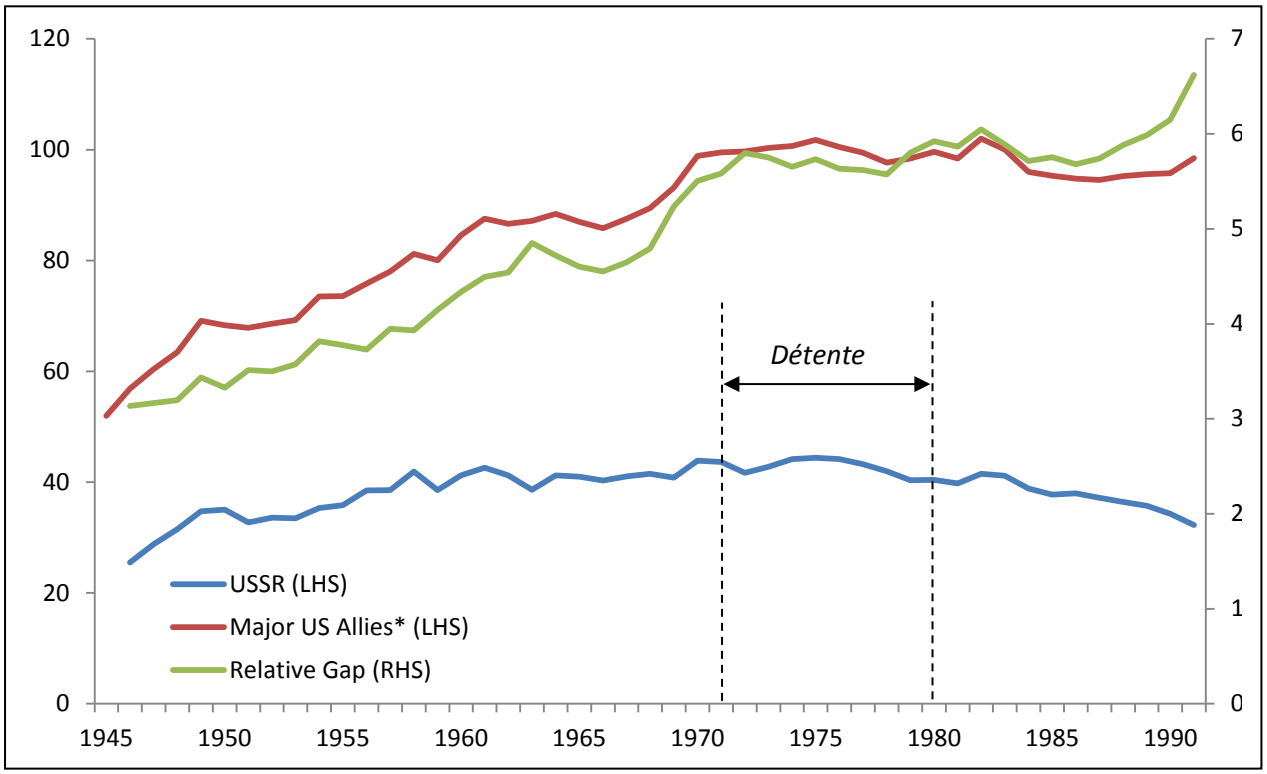
Source: My calculations, based on data in Maddison (2003). Data is in 1990 US$ (Geary-Khamis PPP dollars).

Summarising the impact of (re-)integration enabled catch-up growth on the economic balance of power throughout the Cold War, therefore, three key features stand out. First, the 1945-73 period saw a convergence of both the Soviet Union and the Western follower major powers towards the economic output of the United States. Second, after 1973, Japan continued its convergence, the three Western European major powers retained an approximately stable relative size at around 60 percent of US GDP between them, and the

[86] (Young & Kent, 2004, pp. 387-498)

Soviet economy went into severe relative decline. Third, however, throughout the entire period, none of the individual follower economies came close to overtaking total US GDP, despite the growth differentials noted in the previous two points. Furthermore, the one group of countries that could have conceivably rivalled the United States as a bloc – the three major Western European powers, perhaps in conjunction with Japan and the smaller European economies – were more interested in using the United States as an ally against the principal (and hostile) great power in their region.

Figure 47. Major US Allies' GDP versus Soviet GDP (PPP), 1945-91, % of US GDP



Source: My calculations, based on data in Maddison (2003). Data is in 1990 US$ (Geary-Khamis PPP dollars).
*Japan, West Germany, France, and the UK.

Factor Endowments and the Non-Convergence Dimension of National Economic Size

As stressed throughout this dissertation, catch-up convergence is only one determinant of states' total GDP and economic resource base. Natural resources, population, the pre-existing physical, human, and financial capital stock, and the quality of domestic policy and institutions all also play a major role. Japan, for example, pursued certain policies

– maintaining a low currency peg and pursuing import substitution in key sectors – that we can now see to have complemented and facilitated the broader catch-up growth trends detailed above.[87]

A full discussion of the respective determinants of Soviet and G5 economic performance between 1945 and 1991 is beyond the scope or needs of this chapter. Suffice it to say, however, that three key points merit attention. First, as is well known, the Soviet planned economy and controlled political system were significant inhibitors of growth compared to the variations of capitalist system used by the G5 economies. Partly this bears on the arguments about integration and catch-up growth, insofar as politics and ideology were key causes of the Soviet economy's relative closure to the West and its preference for trade within the (inefficient and comparatively less developed) communist bloc – a system not dissimilar in its inefficiency to UK and French imperial trading preferences in the pre-World War I era – along with such development-impeding policies as restrictions on the exchange of information and international travel. Partly, however, it also accounts for comparative domestic economic weakness in areas with no bearing on trade or other forms of international exchange, such as stifling the economic incentives that reward entrepreneurship and private investment.[88]

Second, population is a key determinant of total economic size – and also contributes to military strength in other ways, most notably via the stock of conscriptable manpower. If two economies have the same GDP but one has a smaller population, that smaller one will have more disposable income for spending on national power resources, such as military forces (because a larger proportion of the bigger country's GDP will go on basic necessities, such as food). Conversely, however, the smaller the population, the greater the development superiority differential that is required for a country to have a large total GDP and function as

[87] (Kennedy, 1987, p. 459)
[88] For an overview of the Soviet economic system and its inefficiencies, see (Nove, 1992)

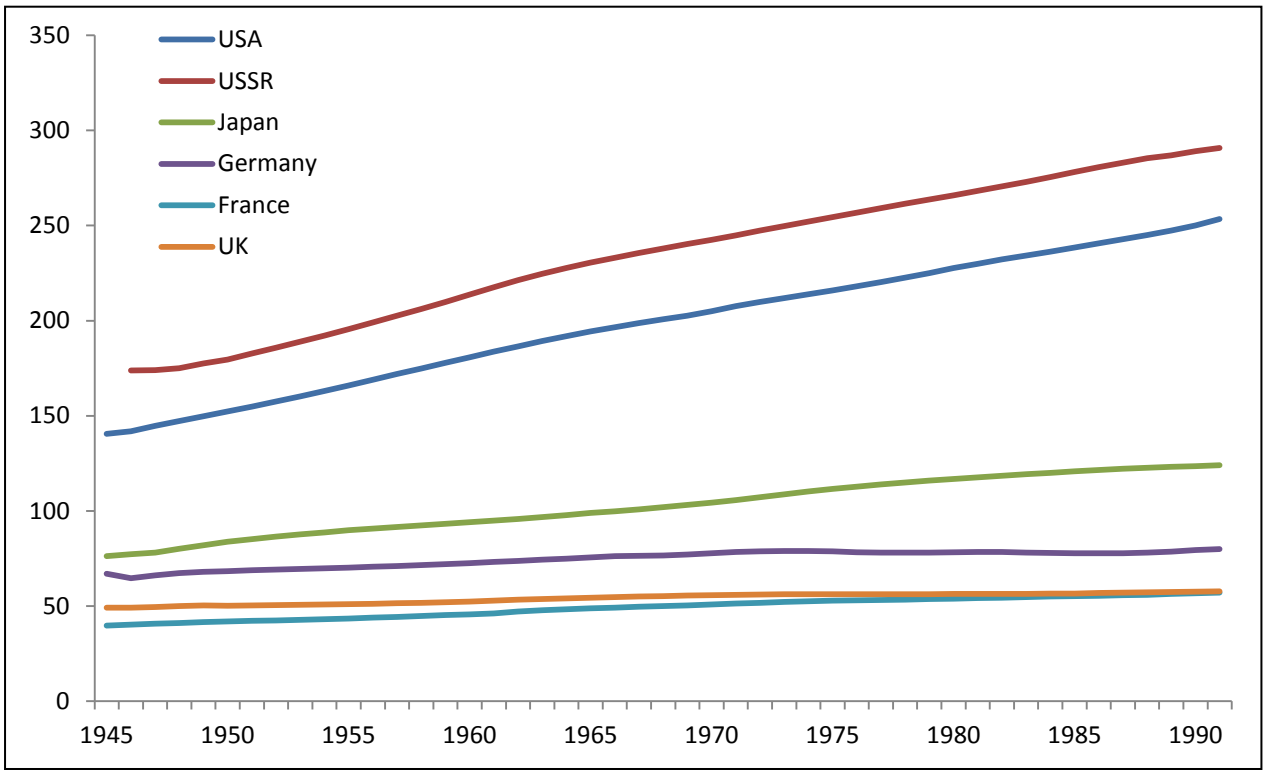
a major power. Figure 48 provides data on the population of the industrialised powers over the Cold War.[89] This data makes the inability of the non-US G5 powers to rival US GDP, even under conditions of per capita catch-up growth, abundantly clear: Japanese GDP per capita in 1991 would have to have been double that of the United States for total Japanese GDP to equal total US GDP. Likewise, the chart makes clear how the Soviet Union was able to support certain manifestations of superpower status – such as a massive standing army – even while the total amount of national economic output available for 'disposable' purposes produced by the Soviet economy was actually, if anything, less than that of the comparably sized (in GDP terms) less-populous-but-more-developed second-tier Western economies.[90] In short, the non-US G5 had the development levels but not the population to be true US rivals; the USSR, meanwhile, had the population prerequisites but not the development levels.

Moving to natural resource endowments, energy was one area where the United States and Soviet Union did have a marked advantage over all other extant or potential major powers throughout the Cold War.[91] As of the 1990s, only two other major powers – China and the United Kingdom – were amongst the world's top fifteen oil and gas producers. The United States' retained its 1950 international lead in annual oil production going forward to the Cold War's 1973 mid-point (1950: 267 million tonnes (mt); 1973: 513 mt), but the size of its lead had been eroded by that point by a huge surge in Soviet production (1950: 38 mt; 1973: 429 mt). Both superpowers remained in the top tier of hydrocarbon energy producers separated by an order of magnitude from the rest of the world, along with Saudi Arabia (Iranian production fell substantially following the 1979 revolution), from 1973 until the

[89] (Maddison, 2003b) China is excluded from this chart (a) to keep the chart legible for the USSR and G5, given the large size of the Chinese population, and (b) because such a large proportion of the Chinese population was still in subsistence agriculture or the most basic manufacturing throughout the period that it did not qualify as an industrialised power comparable to the six included states.
[90] Of course, a coercive domestic political system served to offset this difference, insofar as the Soviet government was able to extract a larger proportion of its population's economic output for military purposes than is politically feasible in peacetime democracies – but at the cost of a further long-term erosion of the civilian economy and its ability to compete with the faster growing, richer West.
[91] (Maddison, 2003b)

1990s; US production of 360 mt, in third place by 1999, was still 184 mt superior to the fourth-placed Iranian figure. Of course, these endowments are captured within GDP data. Nonetheless, when thinking in terms of strategic resources that contribute to a state's military potential beyond the simple GDP number, substantial sovereign oil endowments clearly contributed to both sides' military potential in a way that was not accessible to the other major powers.

Figure 48. Industrialised Powers'* Populations, 1945-91, million



Source: Maddison (2003). *Excludes China.

Soviet Development and the Economic Legacy of War and Transfers

As noted earlier, the Soviet Union's strong post-war growth owed in large part to rapid capital accumulation and intra-war technology diffusion, with US and UK transfers to the USSR estimated as accounting for up to twenty percent of Soviet GDP in 1943-44.[92] That rapid growth in Soviet power, and the perceptions of relative decline that it produced in the

[92] (M. Harrison, 1994, p. 251)

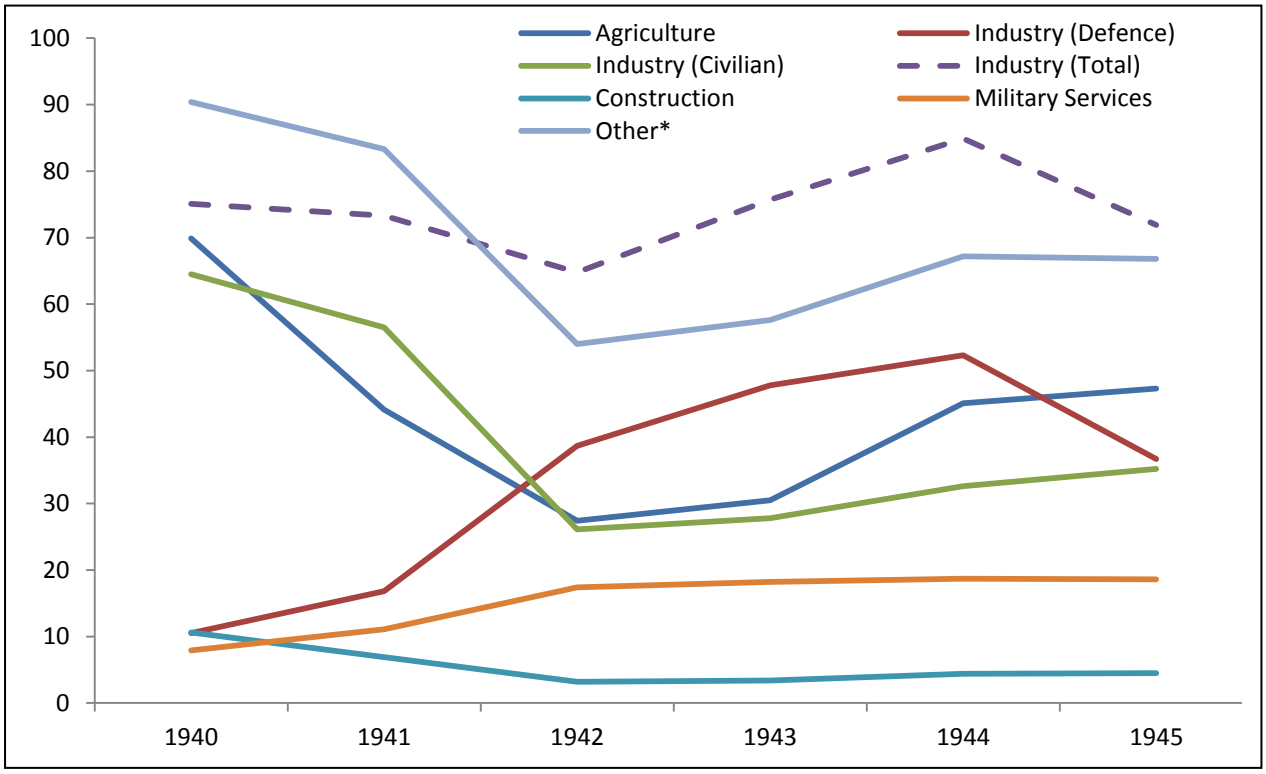
West – perceptions that were justified, insofar as the United States *was* in *relative* economic decline at that time, although as we now know, Soviet economic output was much smaller at the time than Western fears perhaps suggested – undoubtedly contributed to the climate of mutual fear and suspicion that characterised the early Cold War.[93] This fits well with the dissertation's theory: economic factor flows (even if it was more a case of planned transfer than free, market-driven flows) contributed to catch-up growth, which shifted the balance of power, which contributed to a great power security dilemma. The United States and its allies feared for their relative power position and ability to defend their vital interests, including – in the Europeans' case – their territorial integrity and political sovereignty; the Soviet Union, for its part, feared – rightly – that the Western powers wanted to contain and preferably retard its rise. To understand this post-war trajectory, however, it is necessary to understand the beginnings and characteristics of Soviet development immediately prior to and during this early Cold War period.

Figure 49 provides data on the evolution of Soviet GNP from 1940, the year before the USSR's entry into World War II, and the Allied victory in 1945.[94] The true scale of the economic devastation wrought by the war – particularly in its early and middle years, when the German advance into Soviet territory and the subsequent months of fighting in such areas resulted in the devastation of large swathes of Soviet industry, approximately one-third of which had been located near the western border[95] – is clear from the large contraction suffered by all industrial sectors except military production and services. Under these conditions, it is easy to see why a massive Western transfer programme of capital and technology would be such a significant lifeline, and why it would have a considerable bearing on the economy's post-war trajectory. Certainly, the chart provides evidence of the destruction of industrial plant that occurred during the war – plant that needed replacing,

[93] (Young & Kent, 2004, pp. 19-276)
[94] (R. W. Davies, 1998, p. 60)
[95] (R. W. Davies, 1998, p. 59)

through a combination of domestic investment, US and UK allied transfers, and post-war requisitions from Germany and Japan. The chart also provides evidence of a war-induced shift of labour out of agriculture into other sectors: military mobilisation is clearly the most significant explanation,[96] but a switch to the military-industrial sector was also important,[97] and as figure 50 suggests, many of these former rural peasants-turned-factory workers never returned to the fields. Moreover, those who did were hampered by lower productivity growth, partly as a result of being less politically favoured compared to their industrial counterparts, and partly as a result of the battle deaths of so many of the strong and experienced males who had previously worked the land (drought also contributed in certain years).[98]

Figure 49. Soviet GNP by Economic Sector, 1940-45, billion roubles (1937 prices)



Source: Davies (1998), p. 60.*'Other' includes depreciation.

[96] By late 1942, 11 million personnel were serving in the Soviet armed forces, compared to only 5 million at the time of the German invasion – and given heavy losses early in the war, this total uplift necessitated the recruitment of a staggering 16-17 million troops from the civilian economy in just eighteen months: (M. Harrison, 1994, p. 257)

[97] Employment in the defence industry grew from 1.6 million in 1940 to 2.8 million in 1944: (M. Harrison, 1994, p. 257)

[98] (R. W. Davies, 1998, pp. 66-67)

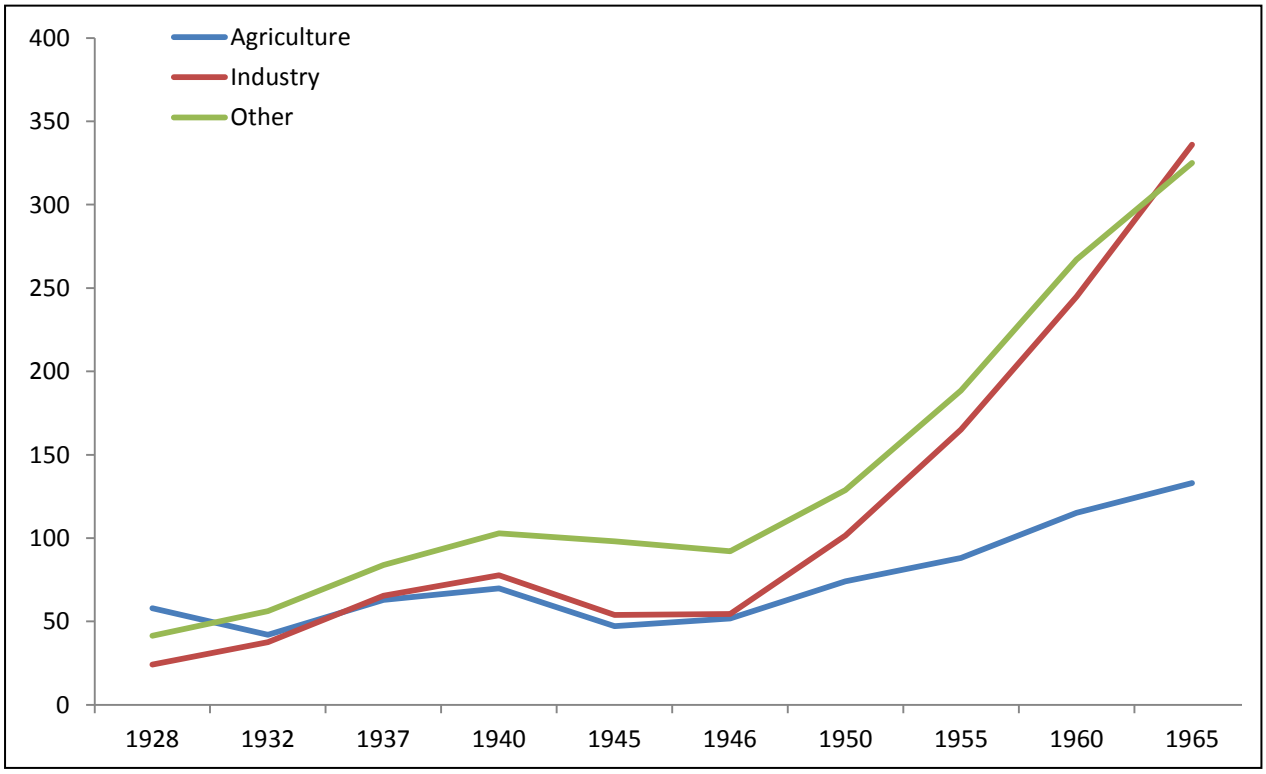
Turning to the Soviet Union's post-war development trajectory, figure 50 makes clear the growth of the industrial sector – both in relation to agriculture, and in relation to pre-war industrial development.[99] Of course, as noted previously, the Soviet system's ideologically- and politically-driven privileging of heavy industry was a liability by the latter two decades of the Cold War, when the capitalist economies were reaping higher productivity gains from other sectors. However, in the first two decades of the Cold War, this post-war reconstruction and development boom – a centrally-planned and domestically-driven process, to be sure, but also one enabled by the immediate pre-, intra-, and post-war capital and technology transfers detailed above – was instrumental in turning the Soviet Union into a modern industrial economy. In turn, this industrial boom was central to the growth of Soviet power during the first two decades of the Cold War. And as noted above, it is unlikely that those first twenty years of the Cold War would have been characterised by such intense security competition, fear, tension, and crises with the potential for devastating military escalation in the absence of such Soviet power growth.

Conversely, of course, as noted above, Soviet economic growth weakened relative to the G5 in the 1970s and, by the 1980s, the Soviet Union was a great power in steep decline. Again, like the early Cold War when the Soviet economy was experiencing relative growth, and unlike the détente era when the two blocs' relative power positions were broadly stable, the 1980s saw a situation of one great power's decline coupled to another and its allies' relative ascent producing a dynamic of mutual fear and intense security competition: a period often known as the 'Second Cold War.'[100] The comprehensive outclassing of Soviet military capability by US President Ronald Reagan's arms build-up would not have been possible without the United States' vastly superior economic base. Moreover, as demonstrated previously, by the 1980s the Soviet economy was no bigger than its Japanese equivalent on

[99] (R. W. Davies, 1998, p. 82)
[100] (Young & Kent, 2004, pp. 515-537)

PPP metrics – and using a market exchange rate definition of GDP, the Russian economy was far smaller than *all* G5 states' by 1989. Accordingly, Soviet planners even had reason to be fearful for their country's position vis-à-vis second-tier powers – against the industrial might of West Germany and forceful stance of Margaret Thatcher's United Kingdom in Europe, for instance, and against a populous and rapidly industrialising China in East Asia. As such, the 'Second Cold War' of the 1980-85 is another period in major power relations that fits broadly with the dissertation's theory: economic integration drove the relative rise of the G5 while the Soviet choice to exclude itself from the international commercial system resulted in its relative economic decline vis-à-vis its Western rivals, this relative economic decline eroded the base of Soviet military potential, and differential shifts in relative power contributed to an East-West security dilemma.

Figure 50. Soviet GNP by Economic Sector, 1928-65, billion roubles (1937 prices)

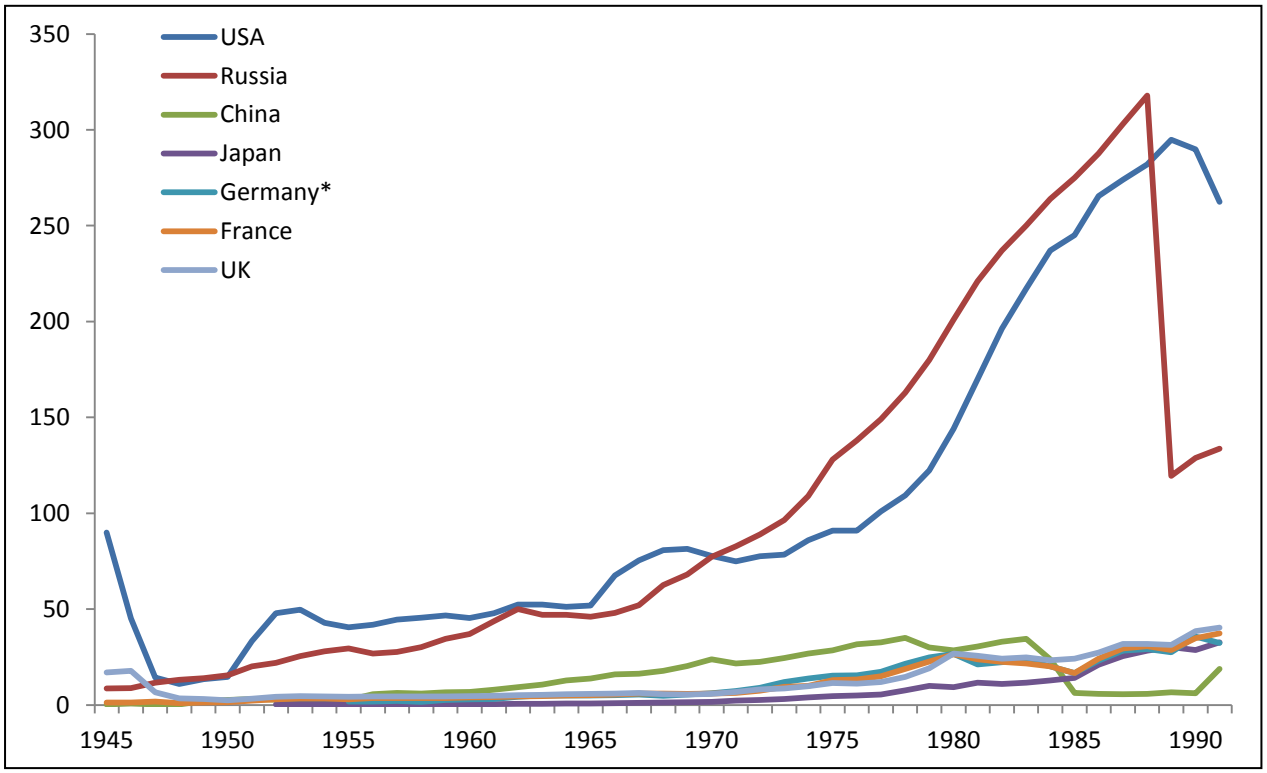


Source: Davies (1998), p. 82.

The Military Balance: Spending, Personnel, and Technological Sophistication

What impact did the economic shifts documented in the chapter have on the major powers' military capability? As the dissertation's theoretical section makes clear, economic power matters principally insofar as it underpins military potential. Of course, because underlying economic potential is the principal determinant of a state's ability to generate military forces in future – more so than the state's currently manifested level of military spending, which can be skewed by particular political considerations (say, democracies' need to provide other services to their voters or autocracies' need to coerce their populations) – economics is the ultimate determinant of a state's power position. Nonetheless, the extant military balance matters as an indicator of states' current capability, the level of military output supported by the economic base, and the level of threat that states perceive.

Figure 51. Military Spending by the Major Powers, 1945-91, then-year US$ billion



Source: Correlates of War: National Material Capabilities, Version 4.0. *Federal Republic (West Germany) from 1955 to 1990; unified Germany at other periods.

Figure 51 therefore presents data on the major powers' defence spending between the end of World War II and the breakup of the Soviet Union.[101] A number of features immediately emerge from this data. First, military spending is an area that much more closely reflects the idea of the Cold War as a bipolar struggle between only two significant states than the economic picture discussed previously. To be sure, the gap between US military spending and the rest of the G5 broadly reflects a comparable gap in GDP, and makes clear the scale of the US lead that the non-US G5 would have had to match – at the cost of severe, Soviet-standard privations in the civilian economy – if they had sought to act as US peer competitors. However, Soviet military spending displays a similar gap over the rest of the G5 despite the absence of such a gap in terms of economic output. Even more strikingly, the Soviet Union not only outspent the non-US G5, but it also began outspending the United States from the 1970s, despite its relative economic decline beginning at around the same time. The Reagan-era arms race of the 1980s and Soviet efforts to retain military parity with the United States during this period stand out clearly, but the difference – as the 1988-89 data makes apparent – is that the United States had the economic base to sustain such an effort, while the Soviet Union did not. This is clear evidence of the importance of political choice in determining strategic behaviour: the international system's superstructure (military spending) during the Cold War clearly reflects the underlying structure (economic resources), but it is far from a perfect correlation. Similarly, among the second-tier major powers, comparatively impoverished China and the smallest two G5 economies – France and the United Kingdom – both outspent Japan and West Germany for the majority of the period, despite these latter states' larger economies and – at least in the German case – their worse geopolitical threat environment. This further supports the contention that international structural pressures and

[101] Correlates of War National Material Capabilities Dataset, Version 4.0; accessed online on 15 February 2011 at http://www.correlatesofwar.org/COW2%20Data/Capabilities/NMC_v4_0.csv. For guidance on the composition and reliability of the Index, see the accompanying Version 4.0 Codebook, accessed on 15 February 2011 at http://www.correlatesofwar.org/COW2%20Data/Capabilities/NMC_Codebook_v4_0.pdf. See also: (Singer, May 1988; Singer et al., 1972)

underlying economic resources explain a significant portion of a state's strategic behaviour, but not all of it.

Figure 52, meanwhile, further confirms that in terms of military personnel numbers, there were two military superpowers in the Cold War, with the United States maintaining an average of 2.48 million men under arms between 1946 and 1991 and the Soviet Union averaging 3.94 million over the same period.[102] China also had a comparably sized army, but as the spending data above implied, this was not in the same league of sophistication as the NATO and Warsaw Pact militaries. The non-US G5, meanwhile, maintained smaller but relatively advanced militaries in the 300,000-600,000-troop region from around 1960 until the end of the Cold War.[103] A number of conflicts that necessitated introducing conscription and/or expanding recruitment are visible in the data: the escalation of the Cold War and the Korean War in the early 1950s (in the American, British, Chinese and Soviet data), France's war in Algeria around the end of the 1950s (in the French data), the Vietnam War (in the American data), the Sino-Soviet split and later Chinese invasion of Vietnam (in the Chinese data), and the thawing of East-West relations in the late 1980s (in all three of the largest armies' data). Military size is a function of population size, which provides the manpower, and the economic base, which provides the means to support it; moreover, the exact combination of wealth and population that supports a large army can vary, as the similarly-sized US and Chinese Cold War armies makes clear.

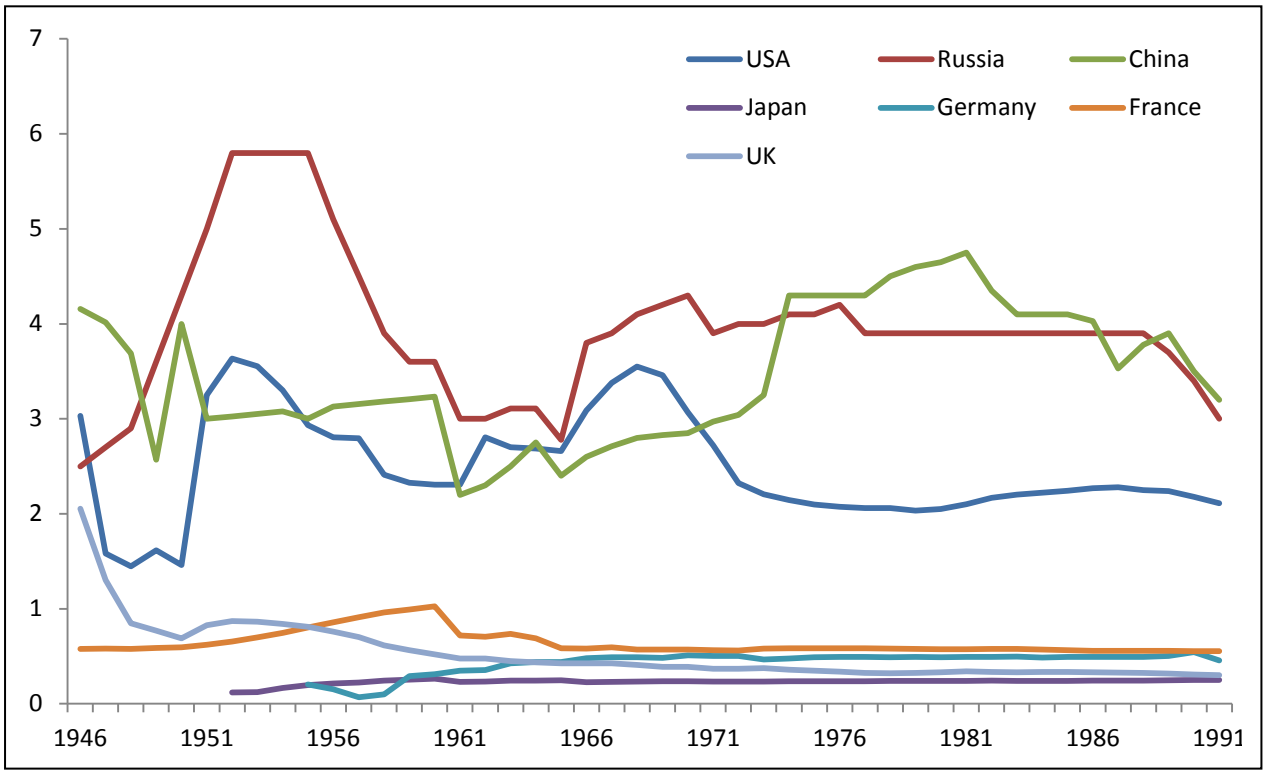
Accordingly, the economic shifts documented above partially account for the respective military sizes detailed here: strong Soviet growth in the post-war period enabled the early Cold War Soviet army build-up, while the United States could not have supported

[102] Correlates of War National Material Capabilities Dataset, Version 4.0; accessed online on 15 February 2011 at http://www.correlatesofwar.org/COW2%20Data/Capabilities/NMC_v4_0.csv. For guidance on the composition and reliability of the Index, see the accompanying Version 4.0 Codebook, accessed on 15 February 2011 at http://www.correlatesofwar.org/COW2%20Data/Capabilities/NMC_Codebook_v4_0.pdf. See also: (Singer, May 1988; Singer et al., 1972)

[103] The French and British armies had been bigger than that in the first fifteen years after World War II as they oversaw the unwinding of empire and adapted to their post-war situation.

such a large army in a country with relatively high labour costs and a largely volunteer force if it was not for the size of its economic base. That said, economic size is clearly only one contributor to military size. The large size of the Soviet armed forces, and their geographical proximity to Western Europe, goes a considerable way towards explaining why the non-US G5 chose to ally with the United States and against the Soviet Union, despite the former's superior economic power, for instance. Just as significantly, however, military size is only one contributor to total military power.

Figure 52. Military Personnel of the Major Powers, 1946-91, million



Source: Correlates of War: National Material Capabilities, Version 4.0. *Federal Republic (West Germany) from 1955 to 1990; unified Germany at other periods.

Following from the previous point, if military size is only one contributor to total military power, the other key contributor is the level of military sophistication, both technological and professional. A large army that lacks advanced weaponry, appropriate logistical support, and the vehicular mobility required for power projection is of limited military utility, as is a large force with advanced technology if it lacks the appropriate tactical

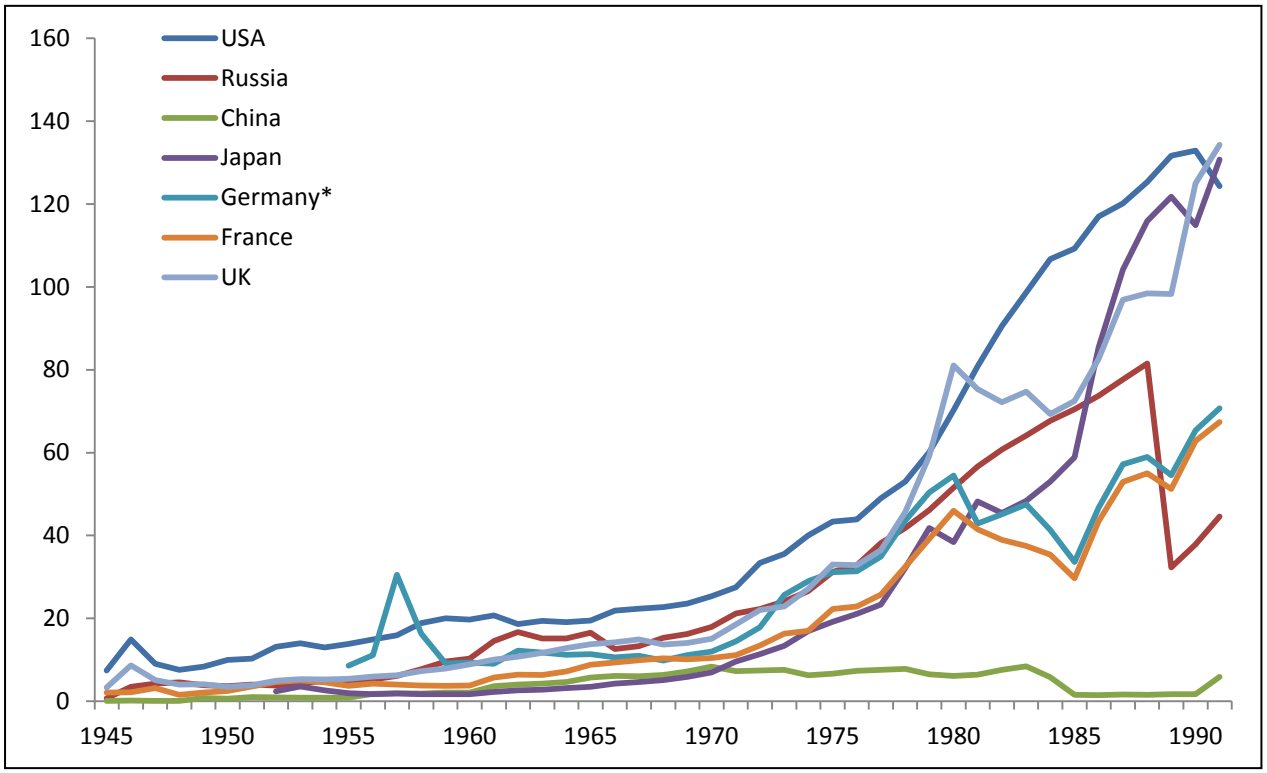
skill and operational proficiency required to achieve strategic goals.[104] Figure 53, therefore, presents data for a proxy of military sophistication: the amount of defence spending per member of military personnel, which provides an insight into the amount spent on equipping, training and supporting each troop.[105] Unsurprisingly, this data displays a stronger correlation with per capita development levels than certain other metrics of military power. Small but advanced economies may support smaller militaries, but they have the wealth to train and equip their troops well. Given its low per capita development levels compared to the G5, the Soviet Union is still militarily punching above its economic weight on this metric – but not by as much as in overall defence spending. The comparative backwardness of China's large but poorly-funded Cold War army is also evident in this data.

Moreover, this data makes clear the difference even amongst the advanced economies, between those configured mainly for territorial defence (France and West Germany) against a continental threat, and those for which aerial and maritime power projection – which is comparatively capital-intensive but labour-efficient – was necessary in order to fulfil their contribution to allied defence (the United States, United Kingdom, and Japan). In short, this is an area where perhaps even more than for military size or total defence spending, respective shifts in economic growth and development, as detailed throughout this chapter, have contributed to shifts in respective military power, with the United States and certain key allies achieving marked technological and proficiency advantages by the 1980s that further contributed to the Soviet Union's relative military decline.[106] Such an effect was further compounded by the fact that, by the 1980s, advanced

[104] (Biddle, 2004)
[105] My calculations, based on Correlates of War National Material Capabilities Dataset, Version 4.0; accessed online on 15 February 2011 at http://www.correlatesofwar.org/COW2%20Data/Capabilities/NMC_v4_0.csv. For guidance on the composition and reliability of the Index, see the accompanying Version 4.0 Codebook, accessed on 15 February 2011 at http://www.correlatesofwar.org/COW2%20Data/Capabilities/NMC_Codebook_v4_0.pdf. See also: (Singer, May 1988; Singer et al., 1972)
[106] For the argument that – contrary to the conventional wisdom of the time, which focused on total force size – the USSR lacked the proficiency and technology to quickly win a Central European *blitzkrieg* offensive, and

technology in areas such as communications and electronics was more important to generating military power than producing large quantities of steel, which had been a source of Soviet strength in the 1950s and 1960s.

Figure 53. Military Capital Intensity of the Major Powers, 1945-91, US$ per troop



Source: My calculations, based on data in Correlates of War: National Material Capabilities, Version 4.0. Data represents military spending divided by the number of military personnel of each state. *Federal Republic (West Germany) from 1955 to 1990; unified Germany at other periods.

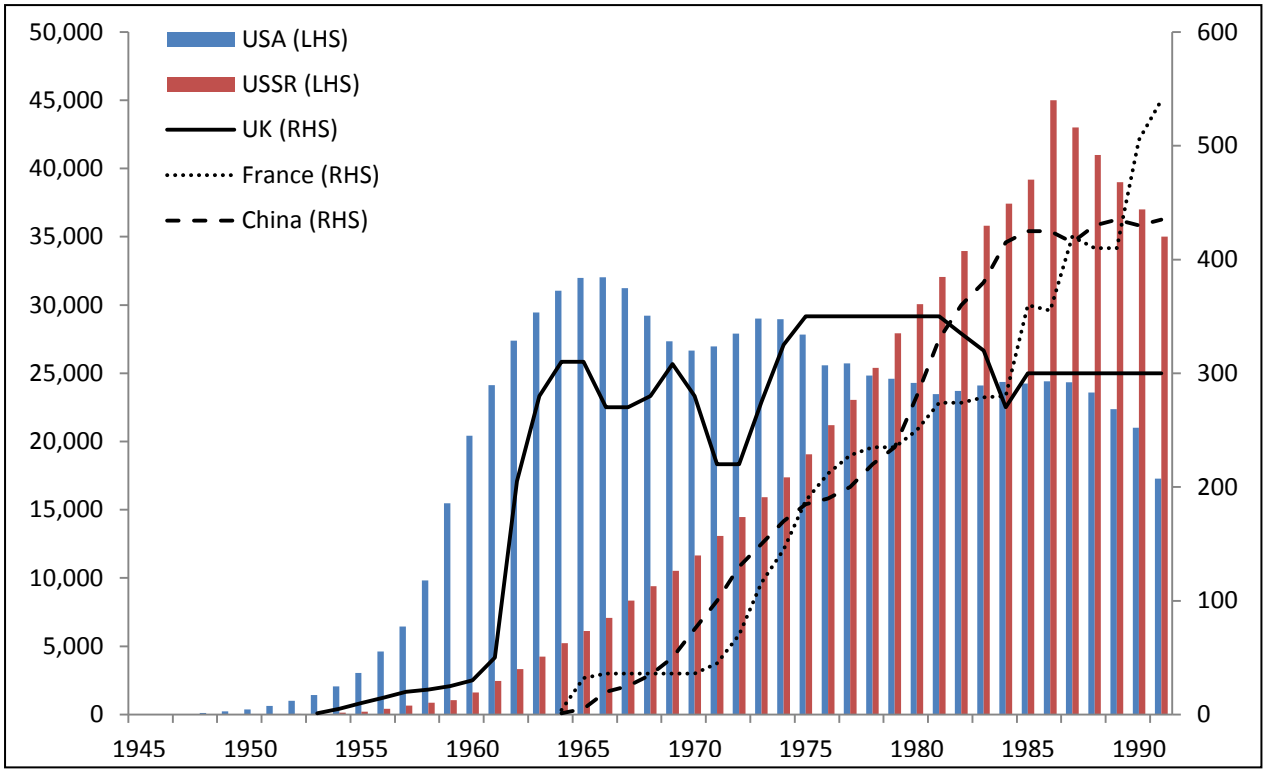
A final key dimension of military power since 1945, and a particularly salient feature of the Cold War, was nuclear weapons. Indeed, nuclear weapons were and remain so revolutionary to international politics that they almost certainly render conventional aggression less likely and the balance of conventional forces subsequently less salient.[107] Figure 54 presents data on the size, as measured by number of warheads, of the five Nuclear

that – once stalled by NATO conventional forces in Europe – the West's economic superiority would augur badly for Soviet prospects of eventual conventional victory, even without NATO recourse to nuclear weapons, see (Mearsheimer, Summer 1982)

[107] (Jervis, 1989, pp. 44-45)

Weapons States' arsenals between 1945 and 1991.[108] As is immediately obvious from the use of different chart axes, the Soviet and US arsenals were an order of magnitude larger than those of the United Kingdom, France, and China, with the latter three states' arsenals only ever measured in hundreds while the two superpowers' arsenals were into the thousands by the 1950s.

Figure 54. Nuclear Weapons of the P5 Major Powers, 1945-91



Source: Norris and Kristensen (2006), p. 66. UK, France, and China on lower-denomination axis (right-hand side), for clarity, due to their order-of-magnitude smaller arsenals.

Nuclear weapons are another area of military power that display a significant, but also far from perfect, correlation with underlying economic wherewithal. On the one hand, nuclear weapons development requires the devotion of significant resources and advanced technology. Yet on the other hand, the resource and technological demands of a nuclear weapons programme were not so large – even in the less developed world of the early Cold

[108] (Norris & Kristensen, July/August 2006, p. 66) The Nuclear Weapons States are the five possessors of nuclear weapons recognised by the Nuclear Non-Proliferation Treaty (NPT) of 1968. Since then, however, India, Pakistan, Israel, and North Korea are believed to have also acquired nuclear arms. South Africa acquired but then dismantled a small number of atomic weapons.

War – as to put them beyond the reach of even a mid-sized economy with sufficient political will. The vast arsenals and associated delivery systems of the United States and Soviet Union naturally demanded far greater resources than the more modest arsenals of the other Nuclear Weapons States (NWS), which themselves require far greater resources – mainly for the deployment of survivable delivery systems, such as nuclear-powered ballistic missile submarines (SSBNs) – than the smaller non-NWS arsenals that have emerged since the NPT. However, the true strategic utility of arsenals numbered in the thousands is questionable.[109] Once a sufficient number of sufficiently-sized warheads is acquired to credibly threaten unacceptable levels of retaliation against nuclear or conventional military aggression, and particularly once reliably survival delivery systems such as SSBNs are in place, the deterrent or coercive value of adding further warheads is limited: incrementally adding nuclear weapons produces strongly diminishing marginal returns.

Accordingly, the data presented here fits with the dissertation's theory on a number of levels. First, the start-of-period leading economy – in terms of per capita development and sophistication – was also, unsurprisingly, the start-of-period leading nuclear power. Second, strong post-war recovery growth and technological advancement in the follower economies enabled the erosion of the United States' nuclear monopoly. The Soviet Union rapidly developed its arsenal into the thousands, while two of the non-US G5 also acquired nuclear weapons (although the other two, due to a combination of domestic politics and external pressure, did not), as did China. That said, an area of divergence between the theory's claim's about the destabilising effects of power shifts and the evidence of growth-enabled nuclear proliferation is that such a diffusion of nuclear weaponry amongst the major states was, if anything, positive for great power relations.[110] Once both the United States and the Soviet Union had survivable arsenals, first-strike incentives and crisis instability were removed and

[109] (Jervis, 1989, p. 22)
[110] On the stabilising role of nuclear weapons in great power relations, see (Sagan & Waltz, 2003, pp. 3-45)

relations were generally less fraught than in the early Cold War (when the United States had had nuclear weapons but uncertain delivery ability while the Soviet Union lacked nuclear weapons but had larger conventional forces).[111] Meanwhile, the addition of the British and later French arsenals reduced the European fear of US abandonment and strengthened the credibility of the Western allied deterrence commitment.[112] Finally, and in keeping with the economic situation described in this chapter, the Soviet Union's pursuit of ever-greater numbers of nuclear weapons in the 1980s – peaking at an estimated 45,000 warheads in 1986 – was more a symptom of weakness than a source of strength. Compared to reinventing the Soviet economy so that it was capable of matching the G5, or transforming the comparatively poorly-equipped and -trained Soviet conventional forces to be the qualitative equal of their NATO counterparts, building more nuclear warheads was a comparatively cheap way to match the West in the arms race and signal superpower status, even as the economic base required to support such an effort in future crumbled underneath.

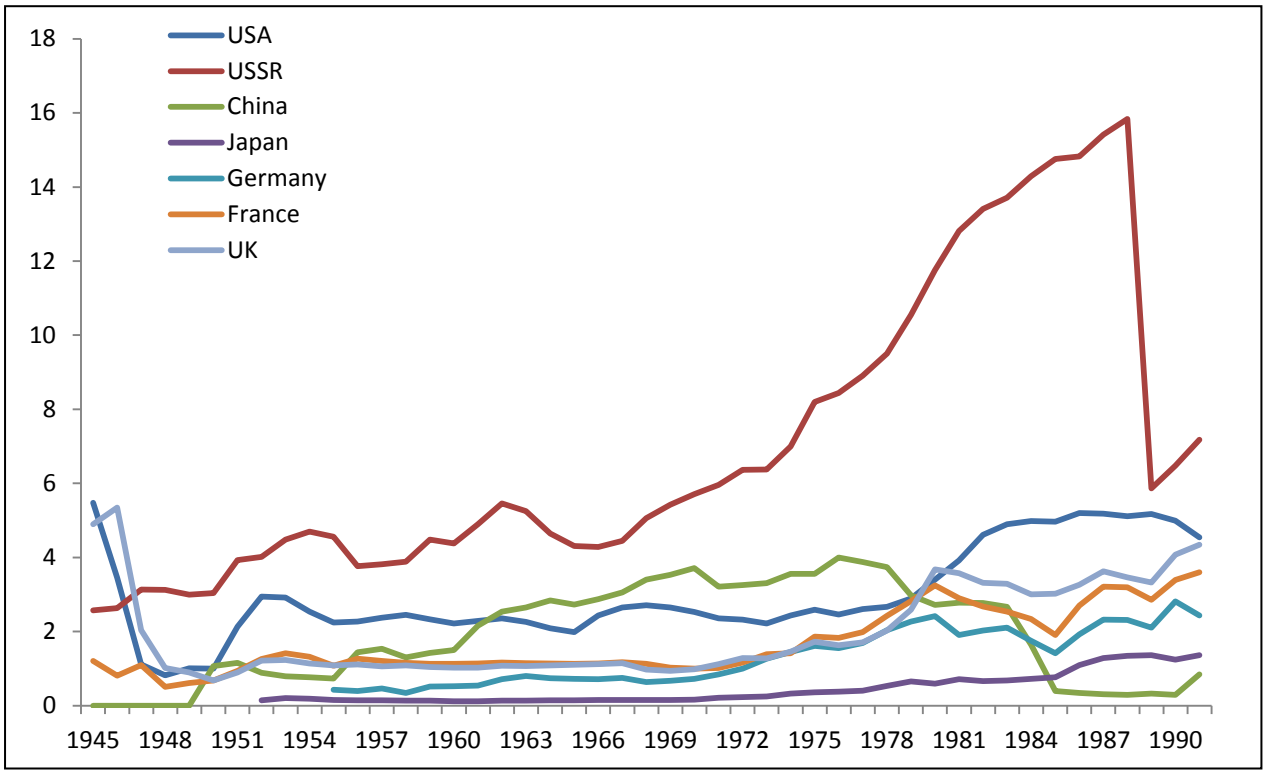
The Defence Burden and the Erosion of the Soviet Economic Base

As noted throughout the previous section, Soviet military outputs during the Cold War were substantially greater than those produced by other states with a comparable economic base, particularly from the 1970s onwards. In the absence of stronger growth – the sort of growth that might have been accessible by participating in economic exchange with the other major industrialised economies, as the experiences of the G5 show – attempting to maintain such defence outlays placed a mounting strain on the Soviet economy, following the process of military overextension coupled to economic decline identified in other contexts by Kennedy.[113] Figure 55 gives a sense of the true scale of the Soviet Union's military

[111] On crisis instability, see (Schelling, 2008 [1966], pp. 244-251) On the significance of *survivable* arsenals for stable deterrence, see (Glaser, 1990, pp. 19-60)
[112] (Goldstein, 2000, pp. 139-146)
[113] (Kennedy, 1987)

overextension by the end of the Cold War, by showing the proportion of the major powers' GDP accounted for by defence spending between 1945 and 1991.[114]

Figure 55. Major Powers' Military Spending, 1945-91, % of GDP*



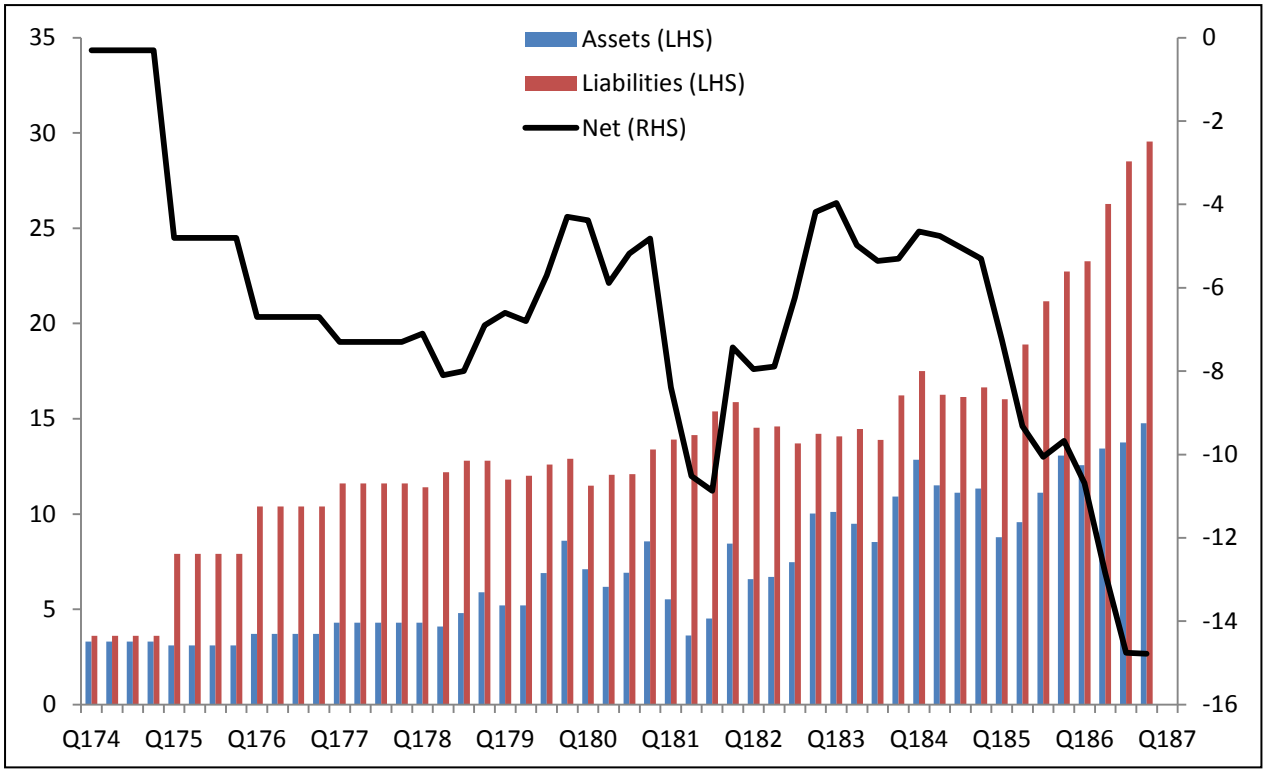
Source: GDP data from Maddison (2003); military spending from Correlates of War: National Material Capabilities, Version 4.0. *Note that military spending is in then-year US$ at market rates, while GDP data is PPP in constant 1990 US$; as such, data accurately reflects inter-country comparison at any given point in time, but does not accurately reflect inter-temporal shifts.

The scale of the burden placed on the Soviet economy by attempting to maintain military parity with the United States and its allies is clear from this chart, and the unsustainability of the effort given the major escalation in proportional spending required during the 1980s is also visible. Conversely, the Western powers were able to continually strengthen their armed forces over the Cold War – particularly during the Reagan build-up of the 1980s – without defence spending growth becoming unsustainable. Accordingly, this fits

[114] GDP data from (Maddison, 2003b) Military spending data from Correlates of War National Material Capabilities Dataset, Version 4.0; accessed online on 15 February 2011 at http://www.correlatesofwar.org/COW2%20Data/Capabilities/NMC_v4_0.csv. For guidance on the composition and reliability of the Index, see the accompanying Version 4.0 Codebook, accessed on 15 February 2011 at http://www.correlatesofwar.org/COW2%20Data/Capabilities/NMC_Codebook_v4_0.pdf. See also: (Singer, May 1988; Singer et al., 1972) See caveat in the chart source note regarding the use of different years' dollar prices for the two data series.

well with the dissertation's theory: in the absence of Soviet economic growth, relative Soviet military decline could not be avoided, despite a major effort to sustain existing defence outputs by devoting an ever-larger share of GDP to the armed forces; the G5, however, were able to support an expansion of military capability without crippling the civilian economy, thanks to the healthy GDP growth that international economic exchanged fostered.

Figure 56. Soviet Dealings with Western Banks, 1974-86, then-year US$ billion*



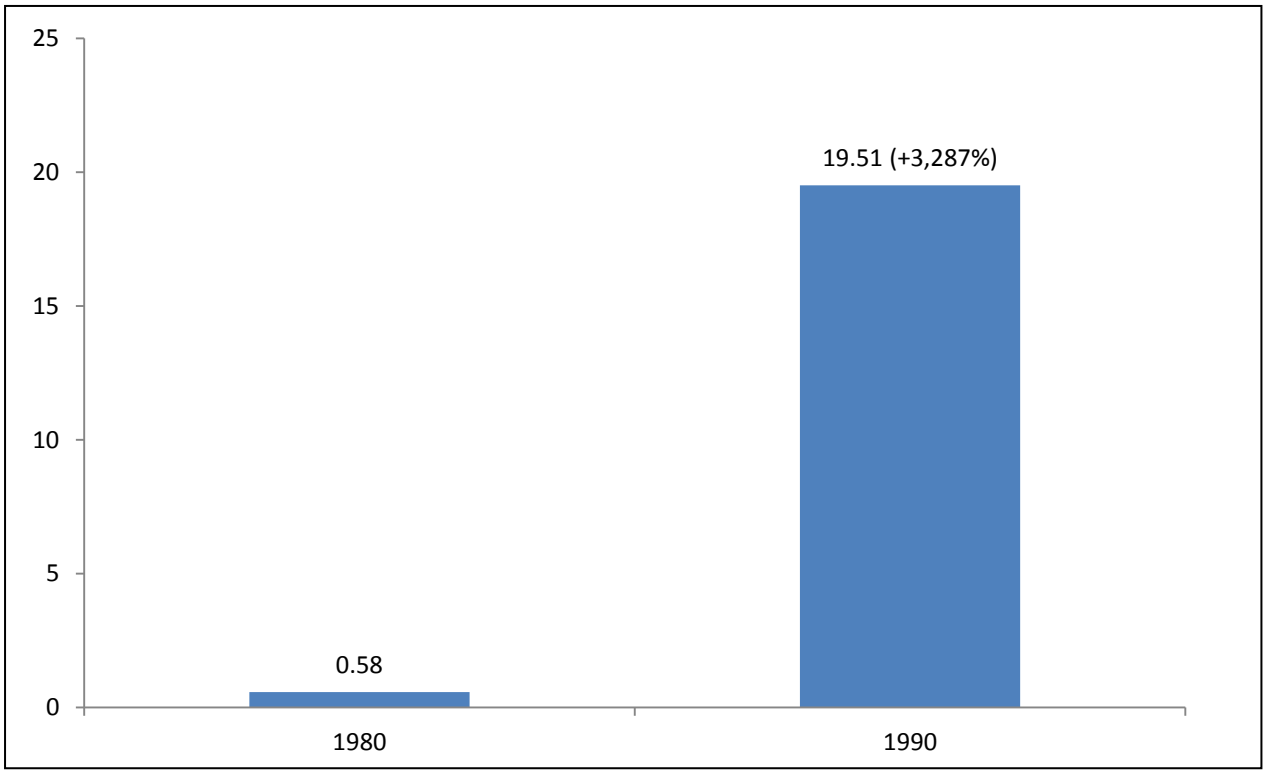
Source: Neu and Lund (1987), p. 9. *Data is for financial institutions settling via the Bank of International Settlements only.

Taking the connection between weak Soviet growth, military overstretch, and eventual terminal national decline beyond the level of simple correlation, figure 56 presents data on the USSR's borrowing position vis-à-vis Western banks between 1974, when economic malaise was beginning to take hold, and 1987, by which point the Soviet economic model was broken.[115] Figure 57, meanwhile, presents data on the catastrophic expansion of

[115] (Neu & Lund, August 1987, p. 9) Note that data is only available for those banks settling via the Bank of International Settlements.

the arrears on Soviet external debt during the USSR's final terminal decade.[116] As both charts make clear, a combination of weak economic growth from the 1970s onwards coupled to ever-growing spending commitments as Moscow strove to sustain strategic competition with the United States and its allies resulted in a deteriorating external debt position. Note, in particular, that figure 96 is not simply showing a 3,287 percent increase in the Soviet external debt stock, but rather a 3,287 percent increase in the *arrears* on that external debt stock: clear evidence of the fiscal unsustainability of Soviet efforts to maintain the country's military position in the absence of an adequate economic base.

Figure 57. Arrears on Soviet External Debt, 1980-90, then-year US$ billion



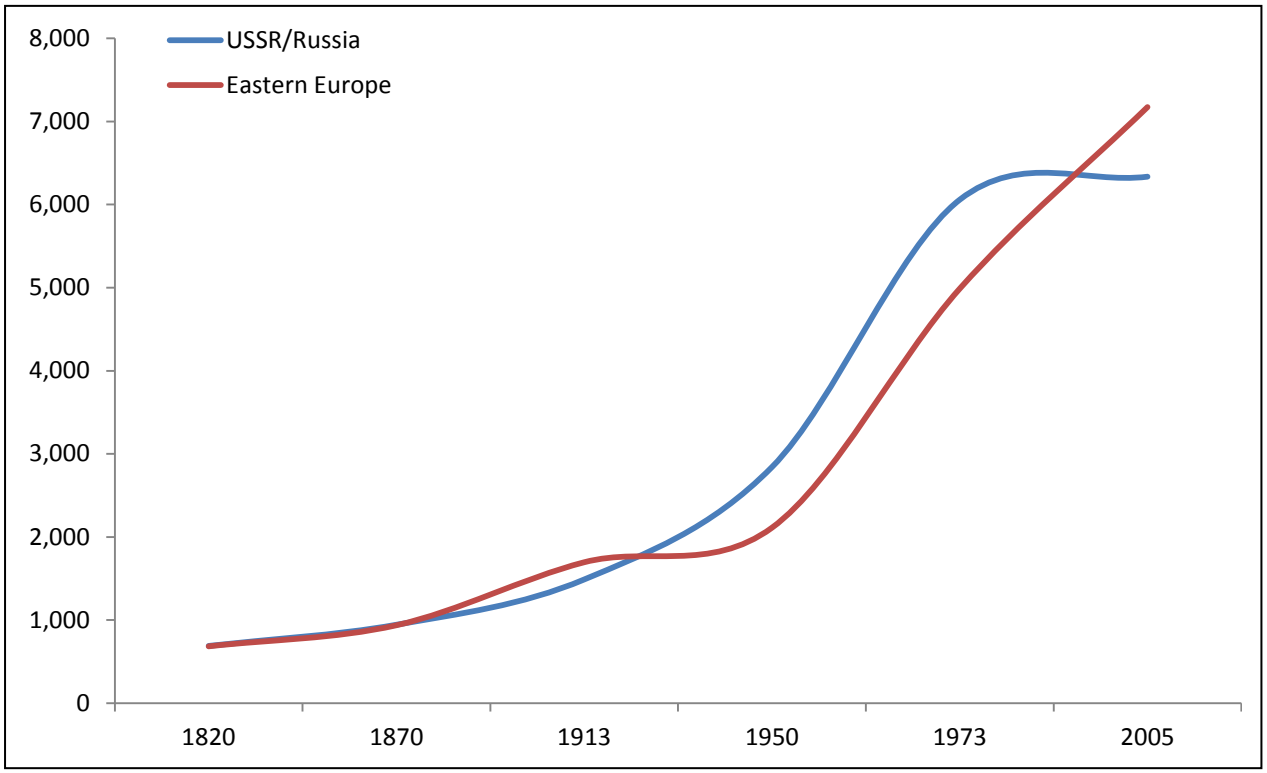
Source: Maddison (2003). The figure in parentheses – 3,287% – represents the growth of total debt arrears over the decade.

As a final aside in this section, returning to the discussion of different countries' respective economic integration levels early in the chapter, figures 56 and 57 between them demonstrate that – at least by the final decade of the Cold War – the Soviet Union was

[116] (Maddison, 2003b)

becoming more involved in international financial markets, suggesting a deeper level of economic integration with the Western economic system than is sometimes assumed. However, in keeping with the broad patterns described throughout the chapter, the Soviet return to the international financial markets in the 1980s was, as discussed above, more a symptom of weakness than a sign of economic 'normalisation.'

Figure 58. Real GDP per Capita in the USSR/Russia versus Non-Soviet Eastern Europe, 1820-2005, US$



Source: Maddison (2003). Data is in 1990 US$ (Geary-Khamis PPP dollars). Non-Soviet Eastern Europe refers to Czechoslovakia, Hungary, Poland, East Germany, Bulgaria, Yugoslavia, Romania, and Albania.

The impact of the erosion of the Soviet economic base and the relative decline of the 1970s and especially the 1980s is brought into stark relief by figure 58.[117] This GDP per capita data demonstrates that, from 1973, Soviet development even fell behind that of the rest of Eastern Europe, a region with similar economic prerequisites (resource endowments, education levels, climate and terrain, institutions, culture, path-dependent historical legacy,

[117] (Maddison, 2003b)

and so forth): the first time that this had been the case since before World War I and the subsequent Russian Revolution that brought the Soviet system into being.

Cementing the United States' Relative Power Position

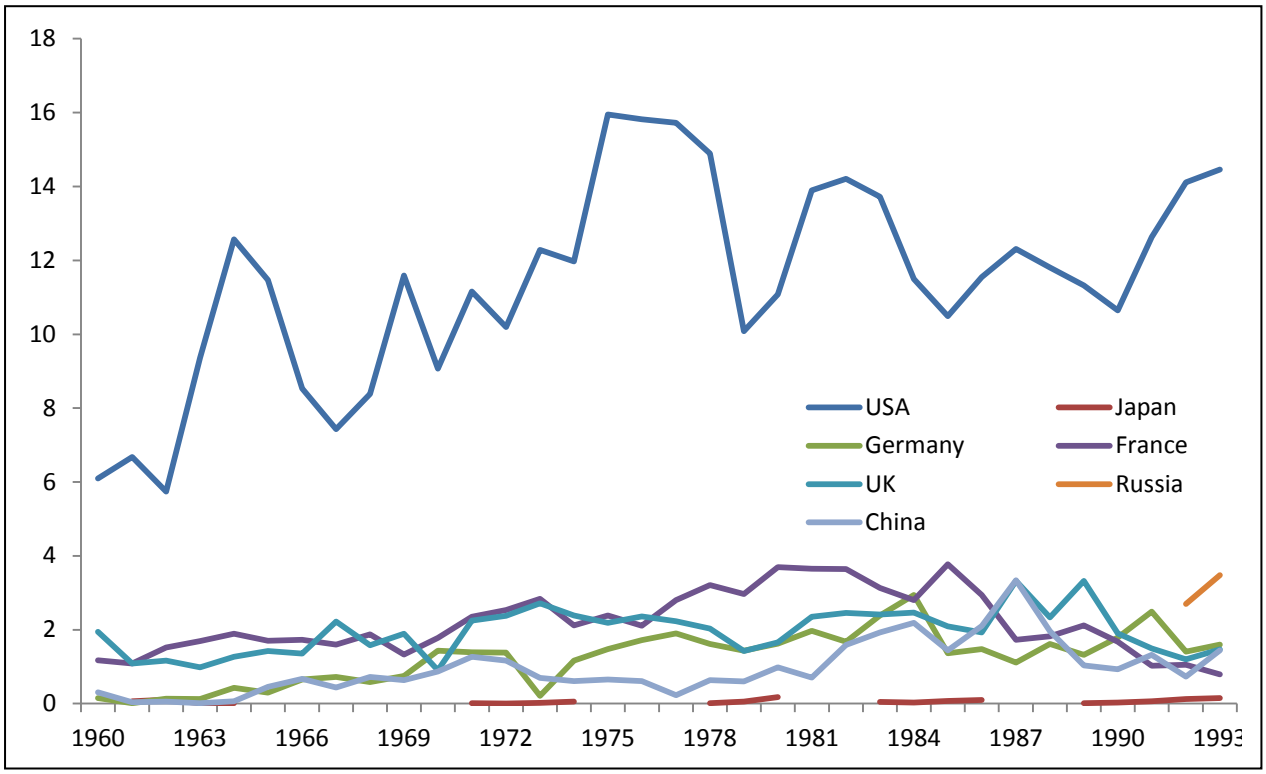
In terms of understanding power shifts and strategic competition during the Cold War, the chapter has demonstrated that despite experiencing economic integration-enabled catch-up growth, the non-US G5 simply were not big enough – even in the presence of such catch-up growth on a per capita basis – to become true US peer competitors in terms of overall economic size. In coalition, there may have been scope for the rest of the G5 to balance the United States, but the size and geographical proximity of Soviet military forces made the United States more useful as an ally than it was threatening as a rival. And from the US perspective, there was little to be gained from militarily threatening the rest of the G5 – in turn giving them little need to fear the United States – given their lack of economic potential to become true peer competitors, and their utility as allies in strategic competition with the economically-inferior but still-large-and-well-armed Soviet Union.

However, even beyond these simple facts of the various major powers' respective economic performance, certain other factors cemented the United States' leadership position within the Western alliance – its hegemony – and made a counterbalancing coalition of the other major capitalist economies unlikely to emerge. First, the nature of the Western post-war alliance system that endured throughout the Cold War (and after) – the 'hub-and-spokes' system of US dominance in East Asia and the multilateral-but-US-led NATO system in Western Europe – were both designed to establish US political control over allies in an unprecedented fashion.[118] The result was an institutionalisation of US authority in the foreign

[118] (Cha, Winter 2009-2010, pp. 158-159)

and defence policies of the rest of the G5 that raised the cost threshold of any potential attempts by the second-tier Western major powers to balance the United States.

Figure 59. Major Powers' Arms Exports, 1960-93, 1990 US$ billion



Source: World Bank World Development Indicators and Global Development Finance (2012). Data is US$ at 1990 constant prices.

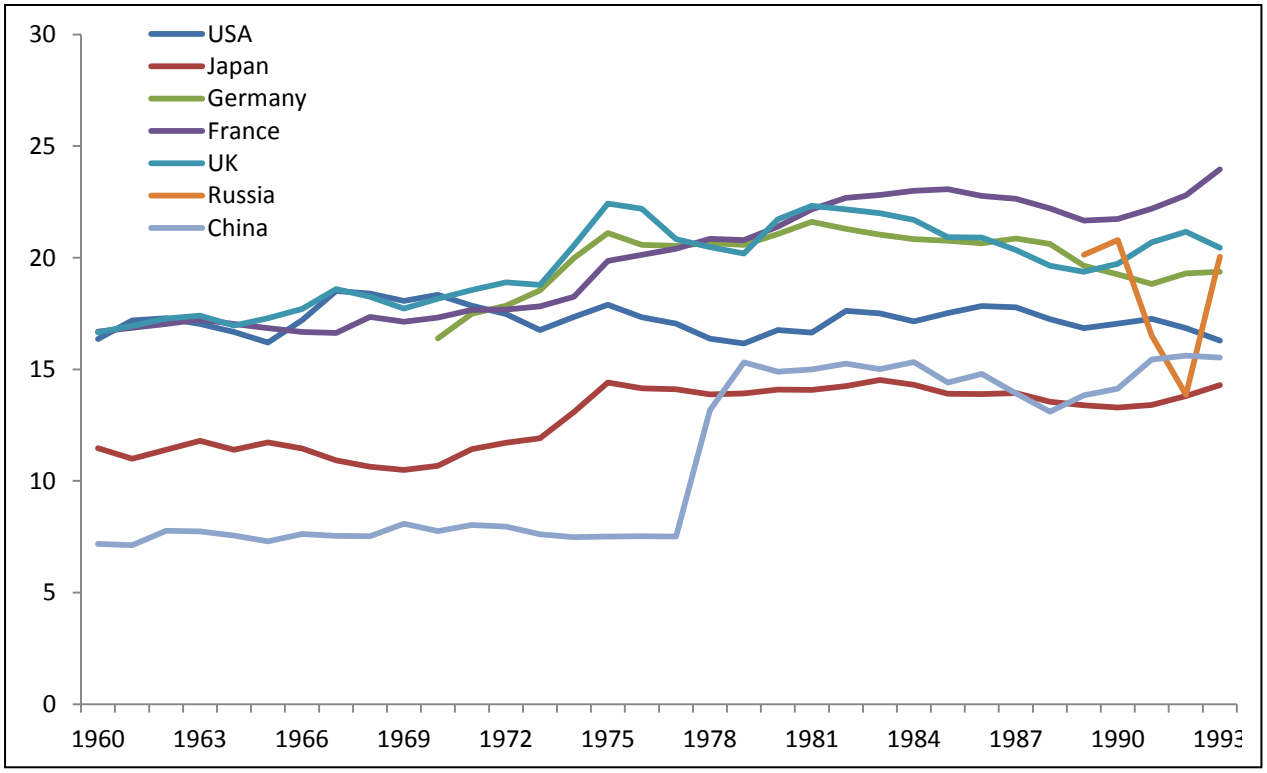
Second, the United States' dominance of the global supply chain for advanced weaponry further added to the difficulties faced by any potential US balancer. To be sure, there were major defence firms outside the United States – British Aerospace (now BAE Systems), Dassault, Dornier (now part of EADS), and so forth – but as figure 59 makes clear, at least when it came to arms exports, US firms retained an order-of-magnitude lead throughout the Cold War.[119]

Third, as alluded to above, and in stark contrast to the unsustainable fiscal-military overstretch of the Soviet Union from the 1970s and especially in the 1980s, the United States managed to retain a fiscal position that, if not healthy, was at least unlikely to lead to

[119] (Bank, 2012)

economic crisis. As figure 60 makes clear, Washington managed to keep levels of central government final consumption expenditure as a proportion of GDP below those seen in the United States' Western European counterparts, despite the Reagan arms build-up.[120] Such an achievement strengthened the United States' strategic position by making overall levels of defensive outlay comparatively sustainable. That said, such a finding must come with the caveat that despite managing to keep central government spending relatively low, the United States' commensurate propensity for relatively low tax rates still produced a deterioration of the country's overall general government debt position in the final decade of the Cold War, as figure 61 makes clear, both over time and relative to the other G5 economies (except Japan).[121]

Figure 60. Major Powers' Central Government Final Consumption Expenditure, 1960-93, % of GDP



Source: World Bank World Development Indicators and Global Development Finance (2012). Data is for US$ at then-year market rates.

[120] (Bank, 2012)
[121] (Fund, April 2012)

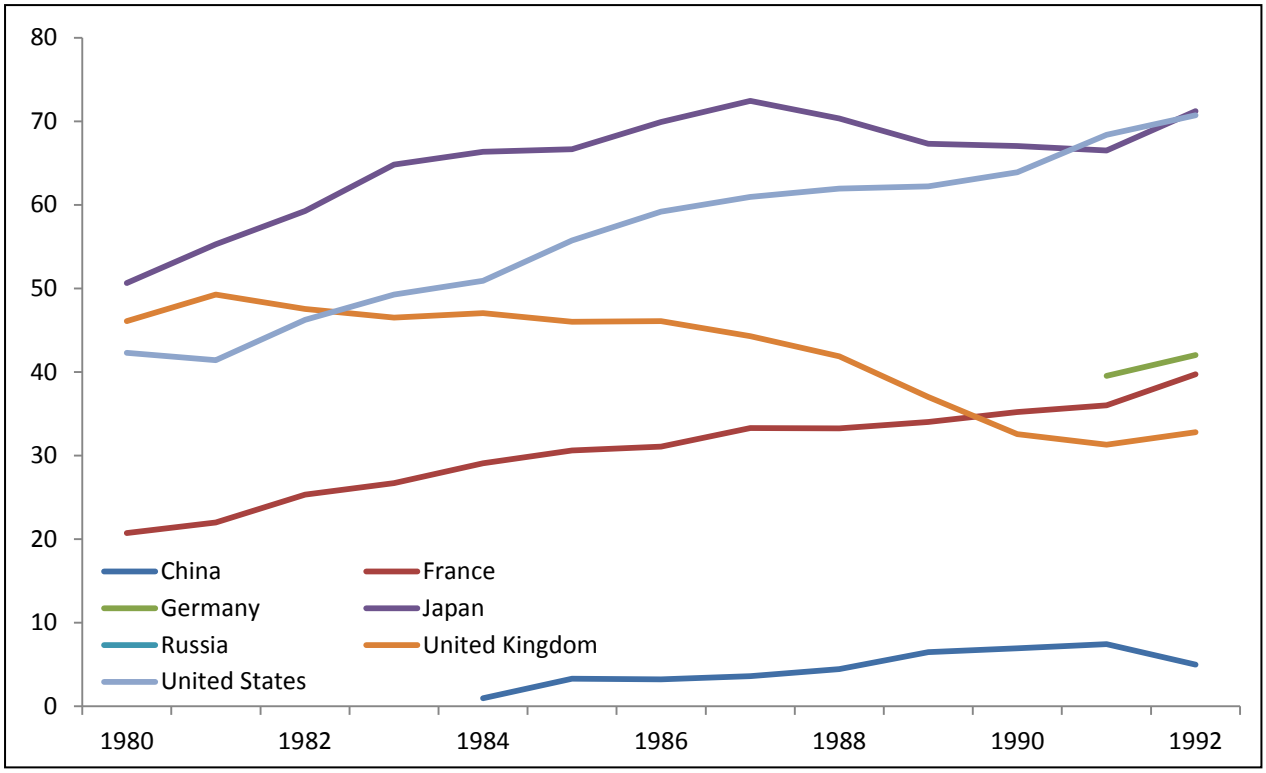
Conclusion

The evidence of the Cold War suggests that, despite the absence of an outright 'hot' war involving large-scale direct combat between the regular forces of the two superpowers, the micro-level mechanisms identified by the dissertation's theory were nevertheless in play. Post-war economic re-integration fostered catch-up growth in the less developed follower economies towards US levels of productivity: the Soviet Union and the non-US G5 economies may have started from different 1945 development levels, but both experienced average annual growth prior to 1973 that outstripped that of the United States, and the transfer of goods, capital, and technology played a key role in that growth. Moreover, that differential growth shifted the balance of underlying economic power, with Soviet GDP (by PPP) going from around 20 percent of US GDP in 1945 to around 44 percent by the early 1970s, and Japanese GDP going from only 6 percent of US GDP in 1945 to around 41 percent by 1991 (and more using a market exchange definition of GDP). No other major power came close to matching total US economic output at any point, but power growth differentials were nonetheless there.

From the 1970s, however, Soviet closure to the international economic exchange that was enriching the G5 resulted in its economy going into relative decline; decline that, by the 1980s, was both rapid and terminal. Accordingly, the early Cold War saw the rise of the Soviet Union and the non-US G5 *relative* to the United States, while the late Cold War saw the decline of the Soviet Union relative to all of the G5 Western economies and China (see Chapter VIII). Correspondingly, the early Cold War saw intense security competition, several dangerous international crises, and bitter proxy wars between the United States and Soviet Union; competition that would have been unlikely to occur in the absence of Soviet power growth. And the final decade of the Cold War again saw intense security competition and an elevated risk of great power confrontation, this time as the United States used its growing

relative economic power to escalate the arms race and as the Soviet Union consequently feared for its position. Conversely, the period after the Soviet Union's relative rise had largely stopped but before its terminal economic decline set in corresponded strikingly with the Cold War's détente period of comparatively stable and cooperative superpower relations, as the dissertation's theory would predict.[122]

Figure 61. Major Powers' General Government Gross Debt, 1980-92, % of GDP



Source: International Monetary Fund World Economic Outlook Database (April 2012); data accessed online 26/08/2012 at http://www.imf.org/external/pubs/ft/weo/2012/01/weodata/index.aspx. Data is for US$ at then-year market rates.

The non-US G5 major economies, for their part, experienced relative rise vis-à-vis the United States for much of the Cold War, but the absence of meaningful security competition

[122] Note that this is not inconsistent with the finding that certain low-level forms of East-West economic exchange promoted conflict reduction during the détente era: (Gasiorowski & Polachek, December 1982) As stressed throughout, the dissertation does not contend that the economic interdependence mechanism is without value, merely that it is often overwhelmed by the power shifts induced by economic integration. Since the détente period was one of comparatively stable relative power positions – not least because the East-West trade that took place in this period was on a comparatively minor scale, meaning that it occurred after the post-war relative Soviet rise had ceased but before economic atrophy had caused Soviet relative decline to begin in earnest – integration-convergence theory would predict comparatively stable and cooperative great power relations, which in turn foster some degree of cooperation in the trading sphere.

was over-determined by an array of factors. Perhaps most fundamentally, not one of those countries – Japan, West Germany, France, or the United Kingdom – had the population prerequisites to be anything other than a second-tier major power, and thus all were incapable of engaging in strategic competition with the United States in anything other than a wide coalition, even in the presence of integration-enabled per capita catch-up growth. Moreover, the geopolitical salience of the Soviet Union meant that it remained the key threat worthy of balancing – and the United States a vital partner in that balancing effort – even despite America's superior economic power potential.[123] And other factors, such as similar domestic political systems, cultural affinity, and the deep institutionalisation of the US-imposed post-war alliance system all conspired against meaningful counter-US balancing by the other major Western powers, even had they had the necessary political will or military-economic power potential.

That said, however, it is worth noting that by the end of the Cold War, when it was clear that the United States had prevailed in its struggle with the Soviet Union, serious US-based analysts were already beginning to debate the potential threat posed to the United States by a rising Japan – a rise that Cold War-era economic integration had facilitated – and US public opinion favoured retarding Japanese relative power growth, even at the expense of forfeiting a measure of US prosperity.[124] Of course, Japanese growth went on to stall and become the weakest in the G5, for a variety of primarily domestic reasons,[125] while the United States continued to enjoy robust growth, so such a threat from Japan never materialised: and as discussed throughout, given its far smaller population, it is unclear that Japan could have ever become a true US peer competitor. Nonetheless, this late- and post-Cold War US reaction to the economic rise of Japan is at least consistent with the

[123] (Walt, Spring 1985)
[124] On the debate over the security threat posed by Japan's rise, see (Friedman & Lebard, 1991; Kennedy, 1987, pp. 458-471) On US public opinion's preference at the start of the 1990s for retarding Japan's relative rise, see (Mastanduno, Summer 1991, p. 73)
[125] (Hayashi & Prescott, January 2002; Leigh, August 2010)

dissertation's wider arguments about differential economic growth, power shifts, and the security dilemma. Similarly, French and British opposition to German reunification, given the power potential that such a unified state would have following West Germany's strong post-war growth performance, is also consistent with the theory, even if such opposition was later relaxed and Germany has subsequently remained relatively under-armed.[126]

In light of the evidence presented in this chapter, what does the Cold War period as a case mean for the dissertation's theory? First, despite the absence of extensive superpower-on-superpower battlefield combat, the theory is not falsified. As noted earlier in the dissertation, outright falsification may occur if economic integration deepened but there were no growth (and thus power) differentials, *or* if integration did *drive* a relative power shift but there was no noticeable uptick in security tensions as a consequence. Here, however, a deepening of economic integration and the ensuing catch-up convergence produced differential growth rates, differential growth rates impacted the balance of power, and shifts in the balance of power contributed to major power security competition. The consequences of that competition included an array of international crises that could have escalated to war, a forty-year period of ferocious conflict in the covert realms of espionage, submarine warfare, and so forth, and bitter proxy wars. One of those 'mere' proxy wars, Korea, resulted in nearly two million battlefield casualties and an even greater number of civilian casualties – and, incidentally, involved force-on-force combat by the militaries of both the United States and the Soviet Union.[127]

Second, however, the case sheds light on the theory's scope and explanatory power. The Soviet experience demonstrates that while international economic exchange can bring about catch-up growth on the part of follower economies, follower economies that absent

[126] On UK opposition, see (Kundnani, 28 October 2009; Volkery, 9 November 2009) On French opposition, see (Mondesert, (Agence France-Presse) 31 October 2009)
[127] On Korean War casualty statistics, see (Defense, 2012) On Soviet forces' direct combat role in the Korean campaign, see (M. O'Neill, Spring 2000)

themselves or are otherwise excluded from such exchange are likely to suffer weaker growth – and a subsequent erosion of their relative power position – compared to states that *are* engaged in such exchange. On the flip side, as the non-US G5 experience makes clear, per capita catch-up growth alone is not sufficient to become a top-tier great power – a pole – in the absence of a suitably sized population. The role of nuclear weapons, meanwhile, as both a threat of total destruction but also (and consequently) a potent deterrent of conventional aggression clearly shows that the offence-defence balance can function as an intervening variable in the causal pathway between power shifts, which may generate a security dilemma and subsequent conflict incentives, and the outbreak of actual 'hot' war. The role of geographical proximity, and particularly the stopping power of water, in determining the relative salience of different military threats played a similar intervening role, as it did during the 1870-1914 period.

Finally, of course, the case highlights the role of variations in domestic political ideology and agency in conditioning the strategic outcomes that arise from a given underlying economic structure. A comparison of Soviet and Japanese defence spending in the 1980s, given their similarly-sized GDPs at that time, makes such a role for domestic political choice and ideology abundantly clear. And so too does the institutionalisation of political relationships produced by the US alliance system, the (comparatively) sanguine response of the United States and United Kingdom to the relative rise of Japan and West Germany respectively, and the Soviet Union's sustained commitment to comparative economic closure coupled to domestic R&D efforts even once it was clear that such an economic model could not match Western technological development.

VIII. Conclusion: From Integration to Confrontation

The conventional wisdom in international relations is that an expansion of international economic exchange between major powers promotes peace.[1] The purported causal logic is intuitively appealing: states that are trading with and investing in each other stand to lose if that commerce is jeopardised by international conflict, and the connections fostered by frequent and intensive economic interaction seem likely to reduce inter-community hostility.

The findings of this dissertation, however, suggest that an expansion of international economic exchange can actually be a potent cause of major power competition and, ultimately, war. Put simply, there is a clear causal pathway from economic integration to political and potentially military confrontation. This concluding chapter to the dissertation first reviews the dissertation's theoretical argument, before summarising the principal empirical findings. It then turns to a final discussion of the findings' implications for IR scholarship and contemporary international politics.

The Integration-Convergence Theory of International Conflict, Reviewed

Deepening international economic exchange is characterised by an expansion of three forms of economic flow: international trade in goods and services, cross-border financial capital flows (sub-divided by FDI, portfolio investment, and bank lending), and the diffusion of skills and knowledge – 'broad' technology – brought about by an expansion of international communications and labour movement. These flows, in turn, can bring about catch-up growth: while all states involved in such international exchange may be growing strongly, less developed economies have the opportunity to grow faster than leading economies as they gain access to lead economy capital and technology. Lead economies must drive the world productivity frontier forwards through their own domestic innovation and

[1] (Mearsheimer, Summer 1990, p. 42)

investment. Follower economies, by contrast, can converge on the development levels of the lead economies by absorption – but only if there is international economic exchange to bring about the required capital and technology flows, with more exchange resulting in more catch-up potential. Of course, such a catch-up result is by no means guaranteed to come about – the quality of domestic economic policy and institutions remains a pivotal determinant of follower economies' ability to reap the possible absorption benefits – but economic integration is what creates the potential. Likewise, along with domestic institutions and policy, pre-existing factor endowments clearly also contribute to national growth potential; it would be foolish to argue that convergence flows are the only significant dynamics in play. Yet working on the basis that states are utility maximisers, it is reasonable to assume that even if some follower economies have inadequate institutions and policies to begin with, at least some will be able to adapt – over time, if not straight away – to reap the catch-up convergence absorption benefits of international economic integration, differing pre-existing factor endowments notwithstanding. And as is apparent from the dissertation's case study analysis, such an assumption is empirically supported.

Catch-up growth, in turn, shifts the balance of power. The resources available for national ends, including the production of military forces, are a product of total aggregate economic size and per capita development levels. As such, if certain economies are growing significantly more quickly than others, the strong growth countries' relative material power increases. In short, international economic integration can create great powers, and cause shifts in the relative standings of those that already exist.

The final step in the causal process is the increase in the likelihood of international conflict and, ultimately, major war that such shifts in the balance of power bring about, which is a result of two underlying mechanisms. First, such shifts are likely to bring about an increase in international polarity in cases where great powers are added to the international

system by catch-up growth.[2] In cases where this moves the international system from bipolarity to multipolarity, or from balanced to unbalanced multipolarity, it moves the system from a less to a more war-prone polarity configuration. Second, a necessary corollary to the relative rise of one great power is the relative decline of another. Great powers in relative decline face a strong incentive to contain or retard the relative rise of others, as they are aware that they will become more vulnerable and less able to safeguard their vital interests over time. Rising powers, for their part, face incentives to curtail declining powers' ability to threaten them and to strengthen their own position vis-à-vis the extant leading powers as soon as possible. And of course, the incentive structures of both rising and declining powers reinforce the underlying logic of the other side's position. These dynamic differentials in power growth are, in short, potent causes of a security dilemma between rising and declining powers. Taken together, this means that the power shifts brought about by international economic integration can both cause a move towards a more war-prone polarity configuration at the *systemic* level and – regardless of whether there is a polarity shift – give both rising and declining great powers a compelling incentive at the *dyadic* level to contain, weaken, and even destroy each other. In the presence of such an incentive structure, intense strategic competition with the potential to result in outright war is likely to be the norm.

The Empirical Record, Reviewed

The theory presented in the early stages of the dissertation and reviewed above was explored and tested through three major case studies drawn from the modern great power international system. The findings of those cases are summarised in figure 1. In covering the 1581-1795, 1870-1914, and 1945-89 cases, the dissertation has taken in several of history's most lethal and politically significant systemic conflagrations, as well as its most remarkable

[2] Note, of course, this is only a likelihood, rather than a necessary result: if a state fell out of the great power tier for every new one that rose to the great power tier, then polarity would remain unchanged.

Figure 1. Summary Overview of the Case Findings

	1581-1795 (Two Phases, 1581-1674 and 1674-1795	**1870-1914**	**1945-89 (Two Phases, 1945-73 and 1973-89)**
***IV:** Did economic integration – trade, financial flows, and labour and technology diffusion – deepen?*	Yes, with Qualifications* *A mercantilist era, not a liberal market one, but in substantive terms, goods, capital, technology and labour flows all expanded	Yes The greatest wave of globalization prior to the contemporary one: widened and deepened on all metrics (trade, capital, knowledge)	Yes, with Qualifications* *One major power, the USSR, was comparatively closed to external flows, except for early years (pre-/in-/post-WWII) and 1980s (needed foreign loans)
Was there differential growth caused by integration (catch-up convergence)?	Yes, with Qualifications* First: differential growth favoured NL (*although for longer than 'simple' catch-up would suggest). Second: catch-up growth favoured Britain	Yes Catch-up growth by USA and Germany, and Japan and Russia (from lower bases), towards UK levels (and beyond in US case)	Yes First: catch-up growth favoured the USSR and non-US G5 towards US levels. Second: non-US G5 still had (slower) catch-up growth; USSR growth slower than G5
Was there a polarity shift at the systemic level caused by differential economic growth?	Yes Move from continental bipolarity to multipolarity in first phase; move from balanced to unbalanced continental multipolarity in second phase	Yes Move from balanced continental multipolarity (plus maritime unipolarity) to unbalanced multipolarity	No, but Yes* *No polarity shift *within* Cold War, but economic decline contributed to eventual end of the USSR, bringing in 1990s 'unipolar moment' *after* Cold War
Were there dynamic differential power shifts within salient interstate dyads?	Yes First: NL up; Spain, France, England down. Second: NL and Spain (again) down; France and England up	Yes Germany up v. UK, France; Russia up v. Germany later; USA up v. Europe; Japan up (low base) v. West	Yes First: USSR, non-US G5 up; USA down (only in *relative* terms – still grew strongly). Second: USSR down; all G5 up (Japan most of all)
Did power shifts cause security tensions and competition (security dilemma)?	Yes First: NL (rising) v. Spain, England, France. Second: England (rising) v. NL, France; France (rising) v. NL, Spain, Prussia, and others	Yes Fear of German rise caused Triple Entente; Entente encirclement, inc. Russia (rising), caused German fear; threat of a European hegemon pulled USA in	Yes* First: USSR (rising) v. West. Interim: *Stable (Détente). 'Second Cold War': USSR (declining) v. West. End: Japan (rising) v. USA (never fully manifested – Japanese growth stalled)
***DV:** Was there 'hot' major war caused by such security tensions?*	Yes Contributed to many, including Thirty Years' War (a systemic conflict)	Yes WWI (also WWII as an extension); contributed to Russo-Japanese War	No, but Yes* *Major proxy wars (e.g. Korea), plus other military measures short of war
Major caveats/ extra factors?	Religion; merchants' and aristocrats' rivalries	'Cult of the offensive'; hyper-nationalism	Nuclear pacifier; size of US GDP lead; ideological divide
Fit with theory?	**Good**	**Very Good**	**Medium**
Type of case?	'Hard,' Crucial Shows full explanatory and historical scope, as a different variant of economic and political international system	'Easy,' Crucial 'Poster child' – close to an ideal type of the purported mechanisms, in terms of economic processes and international results	'Problematiser' Micro-level mechanisms consistent with the theory (so not a falsifier), but only an end-of-case polarity shift and proxy wars – so clearly leaves an explanatory gap

period of economic transformation. The three cases display marked differences in the character of economic integration, to be sure. 1581-1795 was a mercantilist age of state-backed trading houses coupled with the beginnings of early industry and international finance. 1870-1914 achieved depths of integration not reached again until the late twentieth century, but featured a hybrid economic system of liberal market exchange within the Euro-Atlantic sphere coupled to hierarchical imperial domination beyond. And 1945-89 was the precursor to today's economic system within the West – complete with intermodal shipping containers, electronic communications, and floating foreign exchange markets – but occurred against a backdrop of competition between economic systems, with two ideologically incompatible major blocs that had comparatively free factor flows internally but limited exchange externally.

For all of these superficial appearances of dissimilarity, however, all three cases were characterised in substantive terms by a deepening of economic integration – the theory's independent variable. Each saw an expansion of trade, capital flows, and technology and labour diffusion. Granted, in the earliest case, that expansion took part in phases: an initial boom of goods, capital and technology flows that empowered the Dutch Republic, followed by a widening and expansion (particularly on the financial side) that empowered others, including France and most notably Britain. And in the final case, one of the most powerful states in the international system – the Soviet Union – was only significantly involved in international economic exchange with its Western rivals in the earliest stages of the case and again in the final stages. The 1870-1914 case, by contrast, requires little of the caveating reserved for the other two.

Just as each case saw an expansion of trade, capital flows, and technology diffusion, so too each case saw differential economic growth occurring as a consequence. In the first case, the pre-1674 phase saw the Netherlands growing faster than any other major power,

while the post-1674 phase saw Britain undergo a similar boom. In the second case, the United States, Germany, Russia, and Japan all experienced stronger growth than the United Kingdom and France over the duration – plus Russia experienced stronger growth than Germany in the latter stages. In the final case, the pre-1973 phase saw the Soviet Union, Japan, West Germany, France, and the United Kingdom experience catch-up growth vis-à-vis the United States: the former partly as a consequence of inter- and immediate post-war technology and capital transfers; the latter four through a more 'conventional' re-expansion of trade, financial flows, and knowledge exchange. Meanwhile the post-1973 phase saw the Western economies grow faster than the economically closed-off and atrophying Soviet Union, and Japan outstrip all others within the Western bloc. Moreover, in each of the cases, a causal link has been traced between trade, financial flows and technology diffusion, and the observed growth differentials.

To proceed to the final step in the causal pathway, just as each case saw a deepening of international economic integration and corresponding differential growth rates, so too each case saw a shift in the balance of material power that caused a security dilemma, which in turn resulted in major power conflict. The interaction between the rising Dutch Republic and relatively declining Spain resulted in each trying to weaken the other; Habsburg military encirclement of the Netherlands was met by Dutch support for German Protestant rebels, with the Thirty Years' War being a key consequence. A similar pattern repeated itself in the maritime domain, between the Dutch and the English. Moving to the late nineteenth and early twentieth century, the relative rise of Germany prompted the United Kingdom, France, and Russia into a balancing coalition aimed at containment of the central European power. Yet that very containment – along with Russia's upward development trajectory and the relative decline of Germany's principal ally, Austria-Hungary – gave Germany incentives to weaken and defeat the states in the balancing coalition: perhaps the quintessential historical incidence

of the security dilemma in action, a key cause of the outbreak of World War I and, insofar as World War II arose out of the political conditions created by the World War I peace settlement, a contributor to that conflagration also. Even the Cold War – often caricatured as a period of frozen power relations and corresponding stability – actually saw dynamic differentials with a significant impact on strategic competition. The early Cold War was characterised by strong Soviet economic growth, and thus strong Soviet power growth, producing Western fear and thus leading to a containment coalition – which, in turn, produced Soviet fear and efforts to counter Western containment. Intense security competition and – in Korea – major war was the consequence. Conversely, by the 1980s, Soviet power was in relative decline as a consequence of the economic atrophy produced by international closure and outdated modes of production, while US and Western growth remained buoyant, thus facilitating the Reagan-era arms build-up and a re-intensification of the Cold War.

Of course, the Cold War case is not a perfect fit with the theory. The absence of a polarity shift, the absence of superpower-on-superpower direct conventional military combat (small-scale Soviet air force involvement in Korea notwithstanding), and the fact that the principal target of the allied major powers' concern and their associated balancing efforts was not one of the most integrated economies but, on the contrary, one of its most closed, all suggest significant explanatory gaps that fall beyond the coverage of the theory. Likewise, while World War II owed at least an important part to the political conditions created by the end of World War I, that is clearly not the whole story either. The interwar years of 1918 to 1939 were ones of comparative economic closure, yet the most lethal great power war of all time still broke out in the late 1930s. This may fall within the scope of the theory – economic integration actually re-expanded substantially (albeit from a very low base) between 1918 and 1929, plunged again during the Great Depression, then recovered once more from 1933 to

1939 while still remaining low relative to the pre-1914 and post-1945 worlds[3] – but it may not;[4] this would therefore represent a fruitful avenue of future scholarly enquiry. Given such gaps, and as noted throughout, the dissertation does not contend that it offers a master theory of great power conflict that can explain all of every case for all time.

Yet by the same token, neither the Cold War nor the outbreak of World War II presents a falsification challenge or even a significant problem for the theory, either. Falsification would occur if a deepening of economic integration had occurred yet power configurations had remained static, *or* if integration-driven power shifts had occurred yet there had been no visible uptick in major power security competition, but neither of these is a fair characterisation of the run-up to 1939 or 1945-89. Plus, as noted previously, the political settlement of World War I was a key contributor to the eventual outbreak of World War II, and the outbreak of war in 1914 *was* very much a product of integration-driven power shifts.

In sum, then, the theory receives a remarkable level of support from the empirical record. Accordingly, this dissertation's analysis has yielded a significant finding, and a causal explanation for that finding. International economic integration makes major power conflict more likely, and the underlying traceable process behind this observed congruence result is the shift in the balance of power brought about by integration-enabled catch-up growth.

Implications of the Findings for Theory, Policy, and the 21st Century

The theory and associated supporting evidence presented in this dissertation carry significant implications for international relations scholarship. First, as noted at the outset, realist theory – particularly structural variants of realist theory – has long been accused of

[3] (Bordo, January 2002, p. 21) See also figure 12, Chapter VI.
[4] On the significance of *domestic* remobilisation efforts in driving power shifts in this period, see (Overy & Wheatcroft, 2009, pp. 52-56)

lacking dynamic micro-foundations or the ability to explain change.[5] Polarity and dynamic differentials variants of realism may have a compelling account for why power shifts make conflict more likely, but they have lacked an explanation for where such power shifts come from – other than success or failure in imperial expansion and major war, of course, which are causes endogenous to the effects. Integration-convergence conflict theory, as presented in this dissertation, can therefore be seen as a structurally-based realist theory with elaborated economic foundations: it connects the power shifts that realist theory sees as a key cause of conflict back to a generalizable economic process at the systemic level, namely the deepening of international economic integration and the associated factor flows. Moreover, while the recent turn in realism has been towards neoclassical theories that credit an important role to domestic politics as the lens through which power and conflict incentives get filtered,[6] this is still wholly consistent with integration-convergence theory because the material base still forms the underlying causal structure. As such, the dissertation fills an important explanatory gap within realist thought.

Second, the dissertation's findings bear directly on the debate over the impact of trade and other forms of economic exchange on international stability. A central component of liberal thought in international relations has been the contention that two states involved in frequent and extensive commerce with each other are less likely to fight, due to the benefits that would be foregone by the cessation of trade – that is, their interdependence – and the improved knowledge of each other that deep interaction fosters.[7] Realists, by contrast, have been sceptical of such views.[8] The theory and evidence presented here, however, goes beyond the 'basic' realist argument that economic interdependence is unlikely to be a significant barrier to strategic competition with the potential to result in conflict and makes a bigger

[5] On prior structural realist theory's alleged lack of dynamic micro-foundations, see (Dunne & Schmidt, 2005, p. 177; Freyberg-Inan et al., 2009, pp. 3-10; James, 2009)
[6] (Kitchen, January 2010; Lobell et al., 2009; Rose, October 1998; Schweller, 2006)
[7] For a good example of the optimistic position, see (Rosecrance, 1986)
[8] (Mearsheimer, Summer 1990, pp. 42-48)

claim: that strategic competition is a *product* of such economic exchange, due to the shifts in the balance of power that such exchange brings about. Such a finding does not challenge the internal logic of the interdependence-as-cause-of-peace position, but it does suggest that a countervailing mechanism – which my empirical analysis shows to be powerful – is also at work. As such, the dissertation makes a significant contribution to the debate between realist and liberal strands of IR theory – although note too that it does not deny a potential role for other intervening variables that liberal theory sees as likely to mitigate conflict incentives, such as international and domestic institutions.

Third, and following from the previous paragraph, the dissertation bears on discussions of the security impact of contemporary economic globalization. Stephen Brooks argued in 2005 that contemporary economic globalization has made major war less likely in a way that even past epochs of interdependence could not.[9] The argument presented here does not contradict his core argument, but again, it suggests that a powerful countervailing mechanism is at work. Likewise, following Stephen Krasner's earlier argument about hegemonic power and the gains from trade, Jonathan Kirshner has suggested that economic globalization differentially favours pre-existing advanced economies, particularly the largest and *most* powerful such economy – which today means the United States.[10] The argument and evidence presented in this dissertation, by contrast, suggests that the opposite is often true.

Fourth – and perhaps most importantly – the dissertation's findings offer insight into the causes and potential consequences of the rise of new great powers today. In 2003, the Goldman Sachs research team headed by Jim O'Neill coined the term 'BRICs' to refer to four large emerging economies – Brazil, Russia, India, and China – that had begun to

[9] (Brooks, 2005)
[10] (Kirshner, Fall 2008, p. 363; Krasner, April 1976)

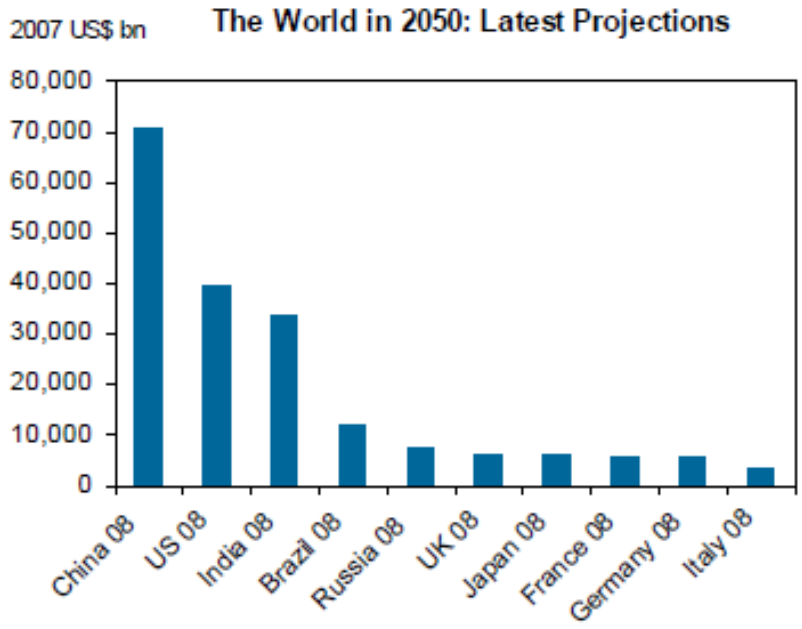
undergo rapid catch-up growth, and that in their opinion would continue to do so.[11] Of course, this grouping is far less homogenous than the acronym would suggest. Brazil and Russia do not have the same total GDP potential in the presence of catch-up growth as China or India, given the former pair's smaller populations. China comes from a much higher pre-existing industrialisation level than India. And Russia is not so much an emerging economy as one recovering using the revenues from its hydrocarbon endowment, and despite its demographic decline, from Soviet imperial collapse and chaotic conversion to capitalism that produced rampant inflation and negative growth rates throughout the 1990s.[12] Indeed, China stands out in a class above the others: as Chapter VII made clear, its catch-up growth began – albeit from a very low base – in the latter half of the Cold War, following the 1978 introduction of Deng Xiaoping's Open Door Policy, and clearly has 'the potential to be the biggest player in the history of man.'[13]

A comprehensive review of this case is beyond the scope or needs of the dissertation, but suffice it to say that it is uncontroversial to argue that flows associated with globalization – trade, investment, knowledge – have been crucial in driving the relative rise of China, India, Russia (from 2000), and Brazil.[14] And insofar as this catch-up growth outstrips that of the G5 Western powers by a sufficient amount for the BRICs' GDP levels to converge on those of the extant lead economies, it is clear that economic integration is once again bringing about a shift in the balance of power.[15] Implication four is thus symbiotic with implication three – the security implications of globalization – noted earlier in this conclusion: the contemporary era of economic globalization is bringing about a rapid and large shift in the

[11] (Wilson & Purushothaman, New York, USA: Goldman Sachs Global Economics, Commodities and Strategy Research, October 2003) For an overview of the associated processes, see also (Kolodko, 2003)
[12] (Macfarlane, January 2006)
[13] Lee Kuan Yew (1993), Prime Minister of Singapore, quoted in (Twining, Summer 2007, p. 91)
[14] For country-specific perspectives, see (Ahrend & Tompson, Paris, France: Organisation for Economic Cooperation and Development, 2005; Alexander, Cooper, & Snowdon, March 2008; Das, July-August 2006; Hay, July 2001; Lin et al., 2006; Mohan, July-August 2006; Rahman & Andreu, 2006; Remington, 2008; Rutland, 2005; Yao & Yueh, 2006; Zhang, April 2001; Zweig, 2002)
[15] (Copeland, 2003, p. 324)

balance of power, which both theory and history show to make major power competition and conflict more likely.

Figure 2. Forecast Nominal GDP of the Ten Largest Economies in 2050



Source: Goldman Sachs Global Economics, Commodities and Strategy Research (2009). Note that this chart was extracted directly from the underlying publication.

Of course, the reason that the contemporary era of expanding globalization – which can perhaps be dated to the early 1990s, after the demise of the Soviet Union, although as noted, China's rise began at least ten years earlier – is not treated as a full case study in this dissertation is that we do not know how it ends. For one thing, we do not know how far new great powers' rises will run, and there are legitimate grounds for questioning the true extent of China's catch-up power potential, particularly as its economic growth has cooled in 2012.[16] Moreover, as stressed throughout, mitigating factors can function as intervening variables between power shifts, conflict incentives, and war. A key lesson of the 1870-1914 and 1945-89 cases is that the offence-defence balance can serve a muting role in strategic

[16] (Beckley, Winter 2011-2012; Oliver & Mamudi, 9 June 2012)

competition, be that a product of geography (the oceanic separation of the United States and Europe) or of technology (the nuclear pacifier of mutually assured destruction (MAD)). Similarly, nothing in the theory presented here necessarily precludes states from transforming the culture of international anarchy to become more (or less) amicable, nor from constructing institutional mechanisms for sharing information and thereby more effectively managing their relations: the EU stands out as a success story on both fronts. Indeed, engaging in over-confident predictions in international relations tends to result in scholarship of a limited shelf-life, because it is such a difficult undertaking.

Nonetheless, the evidence to date from the contemporary era of globalization is consistent with integration-convergence conflict theory. At the global level, a shift from the 'unipolar moment'[17] of the 1990s and early 2000s to an international system characterised by three superpowers – the United States, China, and India – along with six second-tier major powers is not implausible by 2050, as the projections presented in figure 2 suggest.[18] This global picture is complemented by the return of multipolarity in East Asia – potentially of the unbalanced kind – with the ascent of China relative to Japan, the United States, South Korea, and smaller regional powers such as Vietnam and Australia. In Europe, a return to multipolarity also appears to be occurring, as Russia recovers from its 1989-99 decade of continuous economic contraction. And significant power shifts are underway in other regions,

[17] (Krauthammer, December-January 1990-91)

[18] (J. O'Neill & Stupnytska, New York, USA: Goldman Sachs Global Economics, Commodities and Strategy Research, December 2009, p. 22) Other forecasters have also reached similar conclusions: (Alexander, Cooper, & Snowdon, February 2010; Centre, January 2007; Council, November 2008) A major 2008 study suggested that the United States still enjoys unprecedented primacy and operates with scarcely any international check on its behaviour, and that this situation is likely to endure over at least a twenty-year time horizon: (Brooks & Wohlforth, 2008) However, regardless of whether the United States has already lost its unipolar position or whether it only does so in the mid-2020s, the key point is that catch-up growth does indeed seem to be eroding the United States' relative economic lead, which is the basis of its overall relative power position, even if the size and sophistication of the US armed forces ensure that the United States retains its military lead for some time longer. Moreover, as the Cold War Soviet experience demonstrates, a rising great power does not have to attain the economic size or military sophistication of the established lead power(s) to still constitute a strategic rival, peer competitor, and systemic 'pole.' For a critique of Brooks and Wohlforth's sanguine assessment of the US power position, see (Layne, Summer 2009)

too, as Brazil rises in Latin America, India rises vis-à-vis such regional rivals as Pakistan and the Western powers but declines relative to China in South Asia, and so forth.

On top of the global and regional polarity increases that are potentially underway, there are dynamic differential power shifts already observable in key interstate dyads. And sure enough, these dynamic differentials can already be seen to have produced an intensification of major power competition. The US 'pivot' towards Asia in its military and strategic commitments,[19] officially announced in the early 2012 Defense Strategic Guidance but in practice part of a longer dated trend,[20] is clearly directed – if not in as many words – at hedging against and ultimately containing a rising China. Chinese military procurement and policy, for its part, is clearly aimed at achieving area sea- and air-denial capabilities sufficient to push out China's defensive perimeter, secure sea lines of communication crucial to continuing economic growth, and curtail the ability of others to contain it.[21] In the process, the interaction between a China seeking to push out its defensive perimeter and those states with an interest in balancing such assertiveness, such as Japan and the United States, is causing strategic competition with the potential to result in serious conflict, as the 2012 Senkaku/Daioyu Islands dispute illustrates.[22] An increasingly powerful China has also become more assertive in its military behaviour on the border with India, prompting a counter-balancing military build-up from New Delhi.[23] Even in Europe, the debate about the benefits and dangers of assertively balancing resurgent Russian power is manifested in the planning for NATO's 2013 Exercise STEADFAST JAZZ, with some member states advocating a major live-fire exercise aimed at deterring possible future Russian aggression while others fear the deterioration of political relations such a move might produce, as well as the fiscal

[19] (Panetta, January 2012)
[20] (Pillsbury, April 2009)
[21] (Talmadge, 5 August 2010)
[22] (Holmes, 20 August 2012)
[23] (J. M. Smith, 24 June 2009)

costs associated with such a substantial set of manoeuvres.[24] Such disagreements are likely to become more strategically significant as the United States becomes increasingly unwilling – *and eventually unable* – to shoulder Western Europe's defence burden, given its Asian focus and efforts to contain China.[25]

Accordingly, while we do not yet know how the contemporary case ends, the evidence to date fits well with the predictions of integration-convergence conflict theory. This, in turn, suggests grounds for concern over the future trajectory of twenty-first century great power politics. The current international system *is* different in important ways to that which characterised, say, the 1870-1914 period: it is unlikely that any modern-day European major power would attack a small country allied with another European major power, for example, over something so trivial as the assassination of one political leader. Yet while strategic decision-making may no longer be the preserve of offensive-revering European generals and aristocrats, international politics remains an anarchic arena, where states rely on their underlying material capability to generate military forces as the ultimate guarantee of national safety, sovereignty, and survival. And an array of theoretical logic and historical evidence demonstrates that where economic integration drives a rapid and extensive shift in the balance of power, a powerful line-up of mitigating factors must be present to stop that resulting in major power conflict. Ironically, of course, such a deepening of international economic integration is usually a product of a comparatively stable and cooperative period of major power relations, giving the whole cyclical process a tragic quality familiar to realists.[26]

As a final postscript to the discussion above, the dissertation's findings carry policy implications. If a measure of great power competition is returning to the international system, following the uniquely unipolar structural conditions that prevailed in the 1990s and 2000s, this is likely to impact on the foreign policy options of Western states. In a situation of

[24] ("The Delicate Politics of a War Game," 12 April 2012)
[25] (Blagden, December 2009, p. 63)
[26] (Mearsheimer, 2001)

multipolar strategic competition, there is more need to preserve national power resources, such as military forces and the wealth that underpins them, and there is also more need to avoid potential confrontations with other great powers in areas of second-order strategic concern.[27] Both of these needs may result in less scope for the United States and its NATO allies to engage in the lengthy and large-scale direct military interventions in third-party states on the associated grounds of humanitarian concerns, counterterrorism, democracy promotion, and so forth that have proliferated since the 1989 demise of the last significant structural check on US power, the Soviet Union. More generally, a more cautious and restrained approach to grand strategy – what US theorists dub offshore balancing[28] – may suit both rising and declining powers as they attempt to maintain cooperative and peaceful relations. Meanwhile, on the technological side, given the success of oceanic barriers and nuclear MAD in mitigating the competitive effects of globalization-induced power shifts in the past, maintaining a defence-favourable offence-defence balance that reassures both sides of their ability to deter aggression while having little prospect of success through aggression will also merit attention. That may mean that US attempts to attain nuclear primacy and an effective ballistic missile defence system,[29] as well as devoting extensive resources to amphibious power-projection capabilities,[30] both have the potential to be counterproductive.

The unfolding of great power relations in the twenty-first century, in short, will provide a further test of integration-convergence conflict theory and its implications. The insights provided by the theory and evidence to date suggest grounds for concern and caution over the conflict potential engendered by the ongoing power shifts that contemporary economic globalization has brought about. At the same time, however, learning about the underlying mechanisms and historical record of such power shifts provides the best hope for

[27] On the prospects for and conditions necessary to a peaceful management of relative power shifts, see (MacDonald & Parent, Spring 2011)
[28] (Layne, Summer 1997)
[29] (Glaser & Fetter, Summer 2001; Lieber & Press, Spring 2006)
[30] (Blagden et al., Fall 2011, pp. 192-195)

mitigating the pitfalls and avoiding the dangers that they bring. As such, if this dissertation advances the understanding of anyone interested in promoting peaceful and cooperative great power relations in the years ahead, then it will represent a valuable scholarly contribution.

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