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ASSESSING THE IMPACT OF WORLD WAR I ON THE CITY OF LONDON

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Assessing the Impact of World War I on the City of London*

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Abstract

The interwar years saw the rise of New York to challenge London as the world's leading provider of financial services. This paper will show that the current explanations fail to identify a key factor in New York's rise. The City was prevented from operating at full capacity by a capital issues embargo, imposed by the Bank of England to support the pound. As a result, New York was able to enter the sector with little competition from London, and expand rapidly to issue over half of the global capital exported abroad in the 1920s. Without the embargo, this would not have been possible, as the London merchant banks were the most productive producers in the industry, a position built up over the previous half century. This result challenges the consensus that the return to gold was good for the City. The merchant banks suffered and lost business, suggesting that this policy was even more disastrous than is currently thought.

Key words: Financial Services, City of London, WWI, CGE Simulations
JEL classification: N20, F14, G21

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1 Introduction

The City's performance in the interwar years is generally seen as disappointing relative to the golden decades before 1913. Business was lost to the rising international centre in New York, and although Paris and in particular Berlin suffered in this period, London's dominance over the industry declined (e.g. Michie 1992, Cassis 2006). The financial history literature provides a number of explanations for the changes seen. America's rise to become the economic hegemon, the dollar's establishment as an international currency, and New York's expansion into the sector during the war have all been cited as potential triggers for the change. However, these explanations leave some unanswered questions. Does economic leadership automatically generate a world-leading financial centre, and does the development of a stable currency lead to it being used in international transactions? And whilst it seems very likely that being able to enter the sector during World War I was beneficial to the American investment banks, was the war a long enough period for these institutions to fully establish themselves as viable competition to the merchant banks in London? This paper will analyse these explanations from the perspective of the banks, and will show that whilst the current explanations tell part of the story, they fail to identify a key factor in New York's rise.

During the interwar years, the City was prevented from operating at full capacity by a capital issues embargo, imposed by the Bank of England to support the pound. As a result, New York was able to enter the sector with little competition from London, and expand rapidly to issue over half of the capital exported abroad in the 1920s. Without the embargo, this would not have been possible, as the London banks were the leading producers of capital issues, a position built up over the previous half century. This result not only adds to the financial history literature, but challenges the consensus that the return to gold was good for the City.

1.1 Literature review

The interwar period was a time of change for the British economy. By 1913 Britain's position as economic leader had been well and truly over-hauled by the US (Crafts 1998), but the Great War symbolically highlighted this to the world. In economic terms Britain appeared weaker than at any time in the previous century. Her dominance of the old staple industries was successfully challenged by competitors in the Far East, and Germany and the US were way ahead in the second industrial revolution industries. The financial history historiography portrays the 1920s and 30s as decades of upheaval

and transition. The failed attempt to restore the gold standard, coupled with rising protectionist barriers around the globe resulted in a reduction and then implosion of world trade (Harley 2004). Combined with this, the financial system collapse and debt defaults that accompanied the Great Depression almost completely shut down the international lending market from 1930 onwards (Thomas 2004). Given the implosion of demand for the sector's output, it is no surprise that all financial centres suffered in this period. More interesting are the relative changes that occurred within the sector. Paris and Berlin declined dramatically in the interwar years, with both countries suffering from currency crises in the 1920s. This left London and New York, and the rise of the later/decline of the former has been noted by many commentators.

In the literature that focuses on international finance centres, Cassis (2006) sees the transition as inevitable, with London powerless to do anything to stop New York from becoming the financial services hegemon. Cassis argues that this was inevitable; economic leadership went hand-in-hand with financial services leadership. This explanation is liquidity-driven; as the country with the most capital available to invest abroad, New York inevitably became the world's leading financial centre in the interwar years.

Recent work by Silber (2007) presents a different view, focusing on World War I, and its role in propelling the dollar to international currency status. Silber focuses on the work of Treasury Secretary William McAdoo in keeping the dollar on the gold standard and providing an alternative reserve and trading currency to sterling, highlighting the fact that a stable currency is a pre-requisite for any country and financial centre to operate as a global leader. This is clearly part of the story, and although I do not consider it explicitly, I will assume that New York had the ability to become a leading financial centre, a requirement of which is a domestic currency that can be used internationally.

Nadler, Heller & Shipman (1955) agree with both Cassis and Silber, whilst highlighting some other drivers of New York's rise. The establishment of the Federal Reserve System in 1913 and currency fluctuations in the early 1920s are noted as being important in New York's rise following the war. Again these ideas are implicitly included within this paper's explanation, as they refer back to the general theme that a centre can not exist without a currency that is adequately supported and available for use as an international trading currency. All of these explanations are plausible and part of the story, but none of them consider the banks' (the producers of the instruments) and their part in the transition from London to New York.

From the British perspective, the most comprehensive study of the City in this period was conducted by Michie (1992). The work highlights the different

roles the City played, as a centre for credit and trade finance, investing and issuing debt. It was the later that shifted decisively in the interwar years, with New York rising to issue one and a half to two times as much debt as London in the 1920s. In contrast to this, trade financing largely remained in London (with the exception of some goods coming in and out of the US). Michie suggests that the reason for the shift in issuing was a combination of New York learning how to issue over the war and increased demand from American consumers keen to invest abroad (home bias). By learning how to issue efficiently, New York was able to push London into second place. Expanding on this idea is central to this paper's explanation of what happened in the interwar period, and more generally on how a significant exogenous shock can shift the leadership of a particular industry around the globe.

Contemporary commentators collected in Michie (2000) provide a similar explanation, highlighting the shift in focus of the City towards domestic concerns to compensate for the loss of demand from the international sector (due both to competition from New York and generally much lower demand). They also highlight the unofficial controls placed on capital exports in the 1920s. The Bank of England's attempts to return and then keep sterling on gold were threatened by capital exports[1], and as a result these were informally restricted throughout the 1920s. Michie (1992) notes the existence of these restrictions, but only mentions them in passing, and no attempt is made to establish how important they were. Sayers (1976) notes that Norman was using informal restrictions on capital issues, pressuring the merchant banks to not issue capital for foreign countries throughout the 1920s and 30s; "The Governor was relying...on a very tight system of warning on overseas bond issues, and was now telling each issuing house as it came along that persistence with any such proposal would immediately be followed by a rise in Bank rate." (volume 1, page 138). Other authors including Clay (1957), Roberts (1995) and Kynaston (1999) support this, and highlight the fact that with the exception with the latter half of 1925 (the months immediately following the return to Gold) and a few months in 1930, the capital export embargoes were present throughout the interwar years.

Whilst the current literature has attempted to explain New York's rapid rise in the 1920s, there are a number of holes in the explanations. Cassis' argument that New York's rise was inevitable given America's new position as the world's economic leader and major creditor nation does not quite fit. The US became a creditor nation prior to 1914, but did not expand significantly

[1]By exporting capital from Britain, banks were selling pounds and buying foreign currency in the foreign exchange market, thus increasing the supply of sterling and putting downward pressure on its price.

into international services until World War I. Coupled with this, London's continuance as a financial centre whilst Britain lost relative position after World War II implies that economic leadership is not necessary or sufficient for a financial centre to exist.

The other explanations in the American literature also seem incomplete. Having a currency that could act as an international transactor with a Lender of Last Resort back-up was clearly necessary for New York to become an international financial centre, but was it sufficient? Coupled with this, Michie's (1992) explanation is intuitively attractive, but does it tell the whole story. In particular, is it plausible that New York was able to learn and expand so much over the war years that by the time London re-entered the market in 1919 the Americans were able to take over? This paper will investigate these questions, and bridge the gap between the current historical literature and the evidence.

To analyse the impact of the war and its aftermath on the City, I use the formal model developed in Cochrane (2009*b*). The model is based on the developments made in New Economic Geography by Krugman and Venables in the early 1990s. The City's banks use each other's output (information) in production (thus creating an incentive to agglomerate), and combine this with location-specific advantages (captured as a network) that can explain why centres partially specialised in certain instruments. In this model, an opportunity to expand production (e.g. when the competing centre is kept out of the market by war) can lead to a new-comer making permanent in-roads into the industry. I follow the formal analysis of the industry with empirical and archive evidence from a number of merchant banks and the Bank of England, to test whether the model's predictions are true and highlight the key drivers behind the changes observed in the interwar years. Finally I conclude, arguing that the City's previous dominance, built on a strong network and expertise were such that a persistent restriction on output was needed to significantly change the pre-1913 status quo.

The City's decline relative to New York was triggered by the restrictions imposed during World War I. It was further enhanced by the policies adopted to support the pound in the 1920s, which curtailed the operations of the City's merchant banks. Not only does this conclusion challenge the current thinking on who benefitted from the Return to Gold, it also highlights the persistence of the City's advantage over the competition. Without this boost, New York would not have been able to challenge London so effectively in the 1920s and beyond.

2 Empirical evidence

Although the secondary literature talks about the changes that occurred during the interwar years, only small amounts of empirical evidence have so far been analysed to chart what happened. Data are hard to come by, but two sources in particular illustrate the main shifts that occurred in the industry, giving an overview of the changes that took place between the wars. Beginning with trade financing, data on stamp duty revenue shows the key trends for the period 1919-1939.

The data come from British parliamentary papers, and is a revenue stream from stamps on Bills of Exchange and Promissory Notes (by law, every bill had to have a stamp affixed to it before it could be used). For the bills of exchange I am interested in, the amount of stamp duty payable was dependent on the value of the bill, with higher value bills having a higher duty. To create the time series, I took revenue data from the 57th, 73rd and 82nd Report of the Commissioners of His Majesty's Inland Revenue (Cd 7572, Cmd 3802 and Cmd 6099). The data includes bills used to finance domestic trade (although this had all but died out by the interwar period (Cottrel 2005)) and other instruments promising payment in the future, and the reports break the group into domestic and foreign bills. This is particularly useful, as the bills dealing with foreign 'deals' were almost all trade financing bills (although bills dealing with British imports and exports may have been counted in domestic revenue).

Taking the foreign series, and deflating them to take account of inflation over the war[2] (using the wholesale price index from Mitchell & Deane (1962)), I generate an index of volume of foreign bills of exchange for the period 1910-13 and 1920-39. Summary data from this series is presented in Table 1, where I split the post-war period up into four (1920-24, 1925-1929, 1930-1934 and 1935-1939).

The stamp duty give a clear indication of both the recovery of the 1920s[3] and the dramatic decline in the 1930s. Revenues dropped to around 40% of

[2]I can not take account of inflation pushing bills with the same real value into stamp duty brackets relative to 1913, as I do not have a breakdown of how many bills in each bracket were presented each year (the higher the value of the bill, the more stamp duty was due). If this occurred, real revenue would rise (as more bills would pay the higher stamp rates) but the real value of bills in circulation would be the same, implying that the real revenue stream will overestimate the bills in circulation. Given the high level of inflation over the war, it is likely that this was significant, and that relative to the 1913 benchmark, the actual number of bills was lower than the revenue stream suggests.

[3]As has already been noted, the interwar figures are affected by inflation dragging bills of a constant real value up into higher tax brackets. Therefore some of the gains of the 1920s will be fictitious.

Table 1: Average Stamp Duty Revenue from Foreign Bills of Exchange

Period	Nominal Revenue (£m)	Real Revenue (£m)
1910-13	603999	625091
1920-24	1170577	630669
1925-29	1027131	703560
1930-34	343389	319473
1935-39	276335	236279

their average in the 1920s, indicating that world trade declined by around a half to two thirds. Although I do not have any data on New York's share of this market, the data corroborate with evidence presented in the literature (Estevadeordal, Frantz & Taylor 2003), and suggest that the City did indeed hold onto this aspect of international financial services. The 1920s were characterised by a revival of trade to almost pre-war levels (22% global GDP Estevadeordal et al. (2003)), which combined with growth in the world economy expanded trade financing opportunities. The figures show that London took advantage of this, as well as highlighting the well-documented collapse of the 1930s.

The empirical evidence so far supports the consensus that the City was able to hold on to trade financing in the interwar period. The literature on capital issuing notes that New York expanded rapidly but moved more aggressively into particular areas. Taylor's (2003) paper on capital exports to Latin and South America highlights New York's dramatic capturing of the Latin American market. Prior to World War I, London dealt with almost all of the capital issues to this part of the world. By the 1920s, New York was dealing with three-quarters and London just one eighth. At the same time, Cassis (2006) notes that London dealt with the vast majority of issues for the empire (with the exception of Canada).

To support this largely qualitative evidence, I gathered data on capital issues from a United Nations publication (United Nations 1949) on global capital exports in the interwar period. Although the source does not provide annual data, it does give average amounts for the interwar period, as well as a breakdown of destinations for the mid-1920s. Before presenting the data it should be noted that the amount issued by a country does not necessarily correspond with the securities floated in that country's international financial centre. Individuals with capital to invest could buy securities floated in a number of different centres, for example in this period investors in South America had to go through London, New York, Amsterdam etc to be able

Table 2: Current Average Annual Capital Issues ($m)

Period	USA	UK
1919-23	531	416
1924-28	1142	587
1929-31	595	399
1932-38	28	143

to invest in international markets. Despite the caveat with the data, this is the only source on capital issues I have found for the period[4]. The data are presented in Tables 2 and 3[5].

The average figures for capital issues again corroborate the secondary literature, New York was issuing about twice as much capital as London until the Great Depression, followed by the almost-complete shutting down of the international market. What is more interesting are the destinations of this capital. New York took over geographically specific areas, and left others almost completely untouched. In particular, American issues were concentrated on developed countries (if we include Germany, this accounts for 30% of New York's issues) Canada, and Latin America which together made up 71% of their issues. In contrast, the City dominated issues to the empire (with the exception of Canada), as well as 'harder to reach' areas such as Asia and Africa (these areas made up 53% of British issues). The fact that Britain retained the empire is likely to be history-specific, i.e. the political ties between Britain and these nations and the form of the London embargo, but the shift of the apparently relatively cheap-to-gather information countries to New York is an indication of some sort of sorting equilibrium[6].

3 Simulating the impact of the war

The City's experience during the interwar period was very different to the previous 40 years. Rising competition from New York combined with declining world trade and the collapse of international capital markets in the 1930s forced the merchant banks into decline and left London weaker than at any point in the previous half century. Whilst the fall in demand was

[4]It is also not clear how the data has been calculated, and it may be the case that the data are taken from capital issues conducted in New York, London etc.

[5]The data are taken from Table 4, pages 25-26 in United Nations (1949).

[6]This point will be discussed more in Section 3.

Table 3: Destination of Issues for 1924-28 ($m)

Location	USA	UK
Belgium	38	16
France	37	2
Netherlands	9	4
Sweden	16	7
Switzerland	9	
Other Western Europe	12	4
Total Developed Countries	121	33
Argentina	81	19
Australia & New Zealand	45	171
Canada	185	25
Denmark	17	
Germany	224	34
Italy	69	4
Japan	59	16
Norway	26	
South Africa		30
Other Semi-Developed	45	10
Total Semi-Developed	751	309
Latin America	197	52
Asian Countries	8	53
Other European	62	37
Africa		54
Others	3	49
Total	1142	587

beyond the industry's control and affected all centres, the changes that occurred internally (in particular the shift of some but not all power to New York) provide some interesting insights into the scope and scale of the external economies of scale present in international financial services. Using the theoretical framework developed in the pre-war paper, I model the war as an enforced break in British production of some but not all international financial services[7]. This leaves the door open for New York to step in and build up its own industry, as suggested by Michie (1992).

This idea is very similar to the infant industry argument used in development economics, and can arise in the New Economic Geography models; a country is able to build up a particular industry unhindered by competition from an already-established producer abroad, and follow this with entry to the world market as an alternative supplier. However, in reality there is more going on. The empirical data showed that the war had a larger impact on the capital issuing business; New York was able to capture capital issuing, but not trade financing after 1919, despite conducting both during the conflict (Michie 2000). I will explicitly model this, to see how important different production technologies were in generating the shift[8], or whether it was due to other factors (in particular the informal embargo on capital exports from Britain).

As well as the impact of the war, I will investigate the role of one other key factor; government intervention. The secondary literature has suggested that government intervention, particularly the Bank of England's informal restrictions on capital exports in the 1920s (Cottrel 2005), may have restricted the City's output in the interwar years and extended the 'learning period' for New York[9]. These exogenous, politically-driven changes reinforced New York's advantage, by effectively keeping London out of major capital issues throughout the 1920s. By artificially restricting output within the model, I can theoretically assess how important the embargo was relative to New York's growing industry.

[7]Michie (1992) notes that some trade financing (at a much-reduced level) continued to be done using sterling bills, but that capital financing all but ceased during the conflict.

[8]The production technologies will not be fundamentally different, as I will focus on the agglomeration force, and how strengthening or weakening this affects capital issuing and trade financing respectively.

[9]The encouragement of capital exports by the US administration (for example, the Dawes Plan) may have also played a role.

3.1 The theoretical model

Before assessing the impact of the war and the role of the subsequent restrictions on the City's output, a brief summary of the theoretical model is needed. The core of the model is its agglomerating mechanism; input-output linkages between firms. Following the New Economic Geography literature (e.g. Krugman 1991, Krugman & Venables 1993), the incentive to agglomerate is generated through the production function. Firms use each other's output as an input into production, and as a result will locate close to each other to have access to this input. Cochrane (2009*b*) presented archive evidence showing that bankers communicated and trade information informally within the City, which directly translates to the linkages within the model.

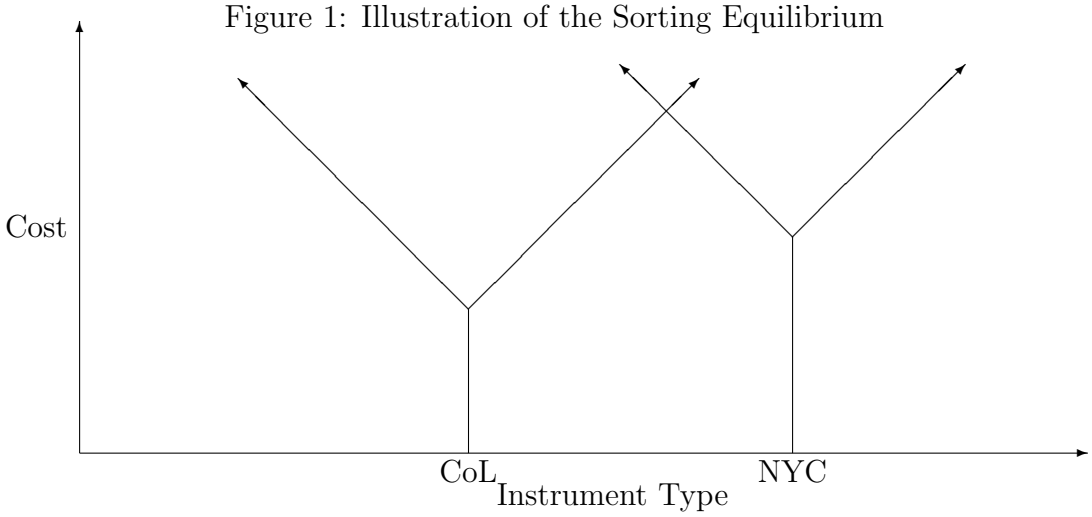
In a frictionless world, this would lead to the complete agglomeration of the sector in one location, which is clearly not a reflection of reality. To offset this, the pre-war paper combined the linkages input with a centre-specific network institution, built up of the merchant banks that operate within the city. This network institution captures the location-specific benefits of agglomeration that are not contained in the input-output linkages. As Esteves (2008) and others have highlighted, the concentration of international financial services in one area allowed the industry to apply political pressure on governments to influence policy, e.g. the City could put pressure on the British government to ensure that none of the colonies defaulted on their loans. The ability to influence policy gave the centre a cost-advantage in certain areas of the industry, and as a result London was not able to completely control the sector; Berlin, Paris etc could compete by exploiting their cost-advantage in specific areas. This mechanism is also at work in the interwar years. New York's taking over financing of American trade (as opposed to other areas)[10] can be explained by the fact that pursuing an American merchant who reneges on his contract was much easier for a New York banker than a London banker.

By incorporating this into the model, the outcome is a sorting equilibrium, where the network and the linkages interact to generate a stable, highly persistent equilibrium. This equilibrium is illustrated graphically in Figure 1, where London and New York have different points on the instrument line, with the distance between a centre and a location on the line indicating how closely related a centre is to the instrument, e.g. Empire securities would be marked close to the City. The vertical cost line relates to the linkages input, with the shorter line for the City corresponding to London's first mover advantage[11]. The diagonal lines fanning out indicate the cost of producing a

[10] How New York was able to move into the sector at all will be discussed in detail below.

[11] The exact form the City's first mover advantage took in the interwar years will be

Figure 1: Illustration of the Sorting Equilibrium



given instrument, where the steeper the slope of the line, the less important the linkages input/first mover advantage is[12]. In equilibrium, the City produces most of the sector's output, but New York is able to capture the areas it has an advantage in.

To formalise these ideas into a theoretical model, both the production and consumption sides of the industry need to be given a specific functional form. The production function is defined in Equations 1 - 3. On the production side it is clear that the banks operated in a monopolistically competitive environment; each bank produced different types of instruments, but they had to compete rigorously for business. To model this theoretically I use **?** framework, which includes internal increasing returns to scale. This assumption is theoretically necessary but also intuitively attractive; banks could reuse information, contacts etc in production implying that doubling inputs would more than double outputs[13]. Increasing returns to scale are built in with the presence of a fixed cost (α), which is combined with an intermediate composite input (G_i), to produce the final output H_i. The intermediate input is a combination of the linkages input (M), the network institution (N),

discussed in Section 3.2, but for now I will assume that in at least one part of financial services London retained the lead, implying at least a small first mover advantage at the aggregate level.

[12]At the extreme, horizontal cost lines indicate that the centre with the first mover advantage completely dominates the industry, as the followed centre can never enter and compete as its costs are always higher. With a positively sloped line, any centre-specific advantage is incorporated, which gives follower centres a cost-advantage in some areas.

[13]For more details on the assumptions and how they relate to the historical reality see Cochrane (2009*b*).

labour (L) and information (A). The linkages input M (this captures the information-sharing etc) is itself a combination of all the different varieties of output being produced in the centre (n_m). For firms, more varieties implies a lower cost of production. The value of an additional variety of input is measured by κ, the elasticity of substitution. A low value of κ indicates that firms benefit greatly from extra varieties, and vice versa.

$$
\begin{aligned}
H_i &= \beta G_i - \alpha, && (1)\\
G_i &= L_i^{\mu} A_i^{\delta} N_i^{\zeta} M_i^{1-\mu-\delta-\zeta}, && (2)\\
M_i &= [\sum^{n_m} m_i^{(\kappa-1/\kappa)}]^{\kappa/(\kappa-1)}, && (3)\\
Where & \quad 0 < \delta, \mu, \zeta < 1, \\
& \quad \alpha, \beta > 0.
\end{aligned}
$$

The importance of each factor in the production function can be measured by their output elasticity (how much output changes as a result of an incremental increase in the factor). As the evidence in the pre-war paper showed, privately-gathered information was at the heart of every merchant bank, implying that information's output elasticity δ must be relatively large to put it at the heart of the production function[14]. Possibly of more interest are the elasticities attached to the linkages input $(1 - \mu - \delta - \zeta)$ and the network institution (ζ). The pre-war paper did not distinguish between the production of capital issues and trade financing, setting the output elasticities the same for both[15]. Although this is a good approximation (all merchant banks used the same four inputs, with information being the most important), the experience of the interwar years suggests that there is more going on. In particular, the linkages input appears to be more important for trade financiers, whilst the network institution is more useful for the capital issuers.

The trade financiers relied on the information garnered from the activities of other banks, brokers etc to assess the credit-worthiness of merchant customers etc. This information came directly from the business dealings of other financial houses, which strongly indicates how important the input

[14]In the pre-war paper δ was fixed at 0.5 and μ (the output elasticity of labour) at 0.25. Although these values are not based on actual data, they fit the archival evidence from the period and can be changed without affecting the results (the model assumes that both inputs are available to all centres at the same cost).

[15]Note that the larger the linkages input elasticity, the more important the agglomeration forces are in production.

from other houses was[16]. In contrast to this, capital issuers were more reliant on the network institution and its ability to gather outside information and place political pressure on the government. To capture this, I allow the output elasticities of the linkages input and the network institution to vary across these two groups of instrument, with $(1-\mu-\delta-\zeta)_{TF} > (1-\mu-\delta-\zeta)_{KI}$ (the linkages input has a higher elasticity for the trade financiers) and $\zeta_{KI} > \zeta_{TF}$ (the network institution input has a higher elasticity for the capital issuers). Relating this back to Figure 1, the trade financiers can be thought of as having a flatter cost line than the capital issuers, as the centre-specific advantage is less important in production. As a result, New York captures less of the sector as a whole (the intersection of the two cost lines will be closer to the point 'NYC').

Having laid out the production function for financial instruments, it is now time to deal with the consumption side of the industry. As with the pre-war model, I retain the three-economy structure, with one economy (ROW) only producing income and two (Britain and America) producing international financial services and income[17]. The utility function is built up using the standard Dixit-Stiglitz formulation presented in Equations **??** and **??** (Dixit & Stiglitz 1977). Here consumers appreciate the different varieties on offer, and their utility increases if more varieties are available (even if the total amount of output remains the same). Again variety-loving preferences are theoretically necessary to create sensible equilibria with multiple firms, but they are also a reflection of reality. Investors diversify their portfolios to optimse risk and reward, implying they do place value on having access to different varieties of securities. The measure of how important the different varieties are is σ, the elasticity of substitution between varieties. The higher the value of σ, the less variety matters to the consumer.

$$U = P^{\alpha}W^{1-\alpha} \tag{4}$$

$$W = [\sum^{n} w^{(\sigma-1)/\sigma}]^{\sigma/(\sigma-1)} \tag{5}$$

Combining the consumption and production sides of the sector gives a general equilibrium model. Before moving on to the equilibrium characteristics and simulation results, it is important to discuss both the simulation

[16]For specific examples of this, please see Cochrane (2009*b*).

[17]Income is produced with under a simple constant returns to scale production function, $Y_i = L_i$. This ensures that the non-financial services part of the economy is anchored, and that the only changes within the financial services sector are internally driven.

methodology and how it relates to reality (specifically the impact of World War I). As with the New Economic Geography literature, the starting point for any simulation is disequilibrium, in the form of an initial first mover advantage for a particular location. In the pre-war paper, I argued that London had a first mover advantage in financial services, that dated back to the 1820s, and that as a result the industry agglomerated to the City. Once there, no other competitor can enter and become a major player, as London can consistently undercut them by taking advantage of the cost-advantage generated by the different varieties of linkage input. In the interwar years, London's first mover advantage is undermined. New York was able to enter the industry during the war (whilst London was forcibly removed) and build up as a financial centre.

Specifying in which areas London and New York had a first mover advantage will be key to establishing how important the war was in New York's development; can any realistic estimates of the War's positive impact recreate the gains made by the Americans in the 1920s, or should London have come out of the conflict still in a dominant position? This point will be discussed extensively in Section 3.2 as it forms the key part of the simulation results. By showing that the War was not enough of a shock to push London into second place in capital issuing, the simulations highlight the fact that a further restriction on capital issuing output must have been present.

3.2 Simulation results

As with most of the New Economic Geography models of trade and agglomeration, the only way to solve the theoretical model presented in Section 3.1 is to set each parameter at a numerical value and simulate the outcome. To begin with, I use the values used in the pre-war paper (Cochrane 2009*b*), but I will perform robustness checks to ensure that the results hold over a reasonable range of parameter values. Doing this means that the elasticity of substitution between different varieties for both consumers and producers (within the linkages input M) is $\sigma = 8$[18].

Despite the similarities between the models, certain parts of the production function differ, and these must also be parametised. In Section 3.1, I argued that the trade financiers and capital issuers gathered different benefits from different parts of the City (the linkages input versus the exogenous network institution benefits), and this now needs to be incorporated into the model. For the linkages input, I argued that the trade financiers benefitted

[18]For a complete discussion of this value and how it fits into the literature, see Cochrane (2009*b*).

more, as more of the information they needed to operate could be gathered from the dealings of others. To capture this, I set the output elasticity of the combined linkages input (M) to be $(1-\mu-\delta-\zeta)_{TF}=0.2$, with the capital issuers elasticity set to $(1-\mu-\delta-\zeta)_{KI}=0.1$. In contrast, the capital issuers potentially gained more from the City as an institution. Confidential information about whether or not a country was going to default on its loans, what it's repayment capacity was etc, coupled with being able to influence foreign policy to ensure debts were honoured, was much more important for the securities issuers. To capture this, I set the output elasticity of the 'network' (N) for capital issuers to be $\zeta_{KI}=0.2$ and for the trade financiers to be $\zeta_{TF}=0.1$

With the parameters set, there is just one assumption left to address. In order to disentangle the impact of the war from the effects of restrictions afterwards, a counterfactual for the impact of the war alone must be established. In particular, the inroads New York made into the sector over the conflict need to be estimated and included. As has already been discussed, the presence of a first mover advantage in some or all of the industry greatly influences the final market shares. Prior to 1913, New York had barely a foothold in this market, with the City entrenched as the world's leading financial centre. This position was derived from London's first mover advantage in the sector, but the war changed this. The conflict forced the City to withdraw from capital issuing[19] and curtail its bill accepting business[20], which allowed New York to enter and begin producing. This exogenous shock overturned the status quo; in theoretical terms it neutralised London's first mover advantage. In order to incorporate this, a new set of first mover advantage 'conditions' must be considered; did New York take over all parts of the issuing business, or just some? In trade financing, did London remain dominant, or were the American banks able to make inroads during the war?

The historical literature (e.g. Michie 1992, Cassis 2006) and empirical evidence in Section 2 suggests that London remained the leading trade financing centre throughout the conflict, but that in capital issuing the New York bankers were able to move in and expand rapidly. Translating this to the theoretical model, this implies that London retained her position in trade financing, but that New York was able to move in and dominate the market in capital issuing[21]. The base position for the impact of the war is therefore

[19]The literature on this period (e.g. Sayers 1976, Kynaston 1999) notes that almost as soon as war was declared, restrictions were put in place to prevent capital export.

[20]A number of merchant banks such as Kleinwort were nearly bankrupted by the conflict, which disrupted the channels of payment between the houses and their overseas customers.

[21]Cochrane (2009*a*) presents empirical evidence illustrating London and New York's share of the trade financing and capital issuing markets in the interwar years. The data

that London retains her first mover advantage in trade financing, but that neither location has an advantage in capital issuing. Intuitively this seems likely to overstate New York's progress over the war, as it implies that in just 4 years the New York investment banks were able to catch up on nearly 50 years of London's experience[22].

Imposing the parameter values and first mover advantage discussed on the model and simulating the equilibrium results in the City producing 62% of total output. Within this, London dominates trade financing producing 80% of total output in this sector, which is what we would expect. London retained her position in this area over the conflict, and as a result New York was not able to enter and expand. In contrast to this, by giving New York a lead in part of capital issuing, the City's share is reduced to 47%. Whilst this is significantly less than London's share of output before the war (despite competition from Paris and Berlin), it does not replicate the output shares seen in the 1920s. The empirical evidence and historical literature suggests that the New York banks were issuing at least twice as much capital as the British in this period, which would imply a market share of around 33%. The simulations are therefore not completely consistent with Michie's (1992) story; although the disruption from the war played a major part, it can not completely explain New York's rise in the 1920s.

Running robustness tests on this finding shows that the only way to re-create the interwar years by just changing the first mover advantage is for New York to have made large enough inroads into capital issuing for it to be the dominant issuer in all areas, including the Empire where London had a clear advantage. This is empirically untrue; London continued to issue some capital over the conflict and immediately afterwards, suggesting that the Americans did not completely dominate this sector in 1918 (Michie 1992). This implies that the rapid rise of New York in the 1920s must have been aided by an on-going restriction on the City's issuing output.

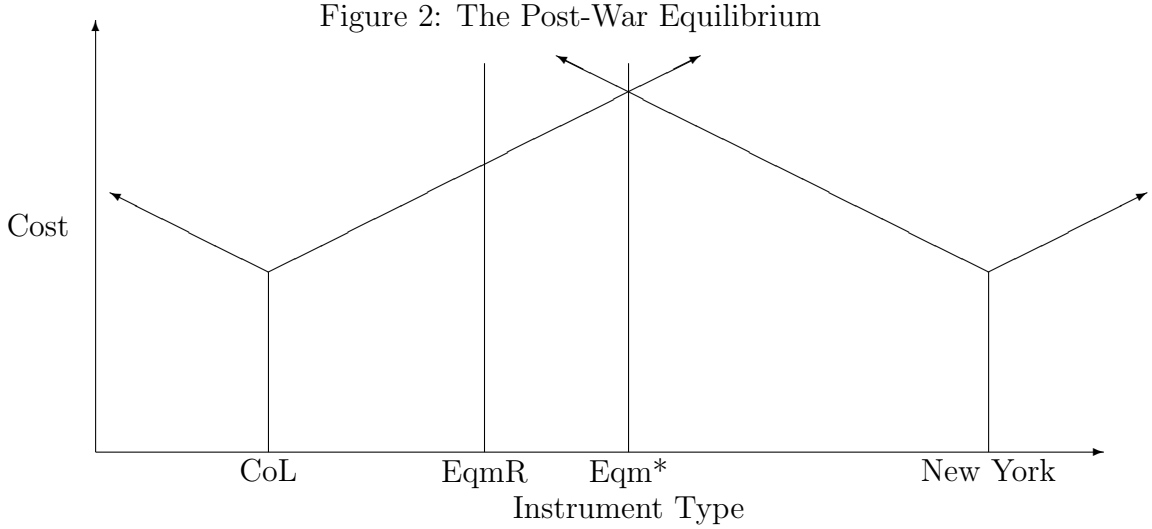
The secondary literature has already highlighted a possible explanation for the gap between the simulations and reality; the capital embargo imposed on the City during the 1920s[23]. Including this in the model, I find

support the qualitative assessment in Michie (1992) that is presented here.

[22]A secondary issue is how well-developed New York's network institution became over the war. It seems likely that the City as an institution was much more developed than New York, and the model's implicit assumption that they were equally powerful is likely to be over-stating New York's gains over the conflict.

[23]Michie (1992) refers to these as informal restrictions placed by the governor of the Bank of England, Montague Norman. In order to return sterling to its pre-war parity, tight monetary policy was adopted and this included limiting the amount of sterling supplied to the foreign exchange markets.

Figure 2: The Post-War Equilibrium



that a restriction of British capital exports to 75% of their hypothetical unhindered level can re-create the 1920s[24]. The constraint on capital issues binds, and results in Britain's share of capital issuing being 33%, with New York capturing the rest. Although we have no data on the number of issues undertaken in London and New York, this figure does correspond with the capital export shares in Table 2(see Section 2). It is also a relatively mild restriction; only 1 in 4 issues that would have been undertaken were stopped. This new equilibrium can be illustrated graphically (see Figure 2, using the same format as in Figure 1). Here London's first mover advantage has been eroded in capital issuing (as was assumed in the simulations), and with out the restriction New York and London would have shared the market (Eqm*). The embargo limits London's output, and as a result New York can expand its output further in the 1920s, to the point EqmR, an artificial equilibrium which would not exist without the embargo. In Section 4.2 the validity of this assumption will be tested against the archive evidence.

The simulations show that shifts away from an equilibrium can only be generated by shocks to the system. Without the War, New York would not have been able to expand its output and make significant inroads into the sector. The model presented thus supports Michie's (1992) argument that New York's rise was due to the learning and expansion opportunities World War I presented. However, the simulation results go further than this, and predict that the Bank of England and Treasury restrictions on capital exports were a binding constraint on the City that allowed New York to enter the market and fill the gap. The result of this was the rise of a new global

[24]As you'd expect, the tighter the restriction the smaller London's share is in this sector.

financial centre that could challenge London for the top spot.

Before leaving this section, I will comment on the interaction of these changes with the centre-specific advantage that was built into the model. This mechanism resulted in the concentration of centres on geographical/political areas that they (or their country) have strong ties to, which made gathering information, applying political pressure etc easier for some areas but not others. Including this in the model results in New York moving into the capital issuing areas it was 'closest' to, for example Canada and Latin and South America. This is because the information-gathering cost advantage reinforces the gains made over the war. The equilibrium is therefore characterised by New York and London specialising in their spheres. Imposing a continuous embargo on the City results in New York being able to capture all of the areas it has a cost advantage in, e.g. Canada, and some areas that traditionally were dealt with entirely through London e.g. Scandinavia. This is supported by the empirical evidence in Section 2, where New York issues most of the loans for Canada, Latin America etc whilst London retains the rest of the Empire, the Far East etc. This is a further robustness check on the model, and it is satisfying that the simulations can match the historical reality.

The conclusion that the capital embargo was bad for the City leads onto a second; the Return to Gold was actually damaging for the City (at the very least for the capital issuers). The traditional argument is that the return to the pre-war parity was essential for London to retain credibility and return to its pre-war operations and position within the global financial system. In actual fact the embargo imposed to support the currency had exactly the opposite effect, driving business away from London towards her competitors. In a final irony, the embargo was ineffective at preventing capital from flowing abroad (Balogh 1947, Sayers 1976, Kynaston 1999, Cottrel 2005). Private investors chose to invest through other centres (including New York), damaging both the currency and the City (Sayers 1976).

In summary, the theoretical model suggests that the City's lead was highly persistent, and that four years of interruption was not enough for New York to usurp London. World War I was significant, but New York needed the restrictions on London's business in the 1920s and 30s to prosper. This combined with the collapse of global trade and capital issuing in the 1930s irreparably damaged the City leaving it battered, bruised and finally beaten in 1945. Despite all this, London has remained a leading financial centre, suggesting that these networks/external economies are very persistent over time; my model supports this conclusion.

4 Evidence

Gathering empirical data for the historical service sector is extremely difficult, and financial services are no exception. The modeling section broke the sector down into two sections, which approximate to trade financing and capital issuing. From the secondary literature and empirical data, the sterling bill of exchange was used to finance the majority of world trade in the interwar period, whilst capital exporting shifted significantly (but not completely) to New York. I begin the empirical section with archive evidence from merchant bank archives which supports the key findings from Section 3.2. This is followed by a detailed discussion of the Bank of England restrictions, with archive material from the Bank used to test the model's predictions.

4.1 Merchant bank archives

To assess the impact of the war and its aftermath on individual banks, I use the archives of Antony Gibbs & Co, Kleinwort & Sons, Hambros and Morgan Grenfell, all of which are held at the Guidhall Library. This is not a large sample (given that the number of banks operating in international services was around 100 in this period), but I have been unable to find many more surviving sets of records[25]. Despite its small size the sample does give me a good selection. Gibbs and Kleinwort were both primarily trade financiers, Gibbs focusing on South American nitrates and Kleinwort on Central and Eastern European trade. On the other hand, Morgan Grenfell and Hambros were capital issuing merchant banks before 1914.

4.1.1 Trade financing banks

The model predicts that these banks should have held onto their pre-war market, although this market was dramatically reduced. The evidence from both Gibbs and Kleinwort supports this[26], and I begin the discussion with Gibbs.

Antony Gibbs' dominance of the nitrate industry (both as an indirect producer and as a merchant and financier in the industry) continued in the interwar years. Since nitrate was a key component of munitions, the firm

[25]The other two major banks whose archives survive are Barings and Rothschild. Given the damage the industry suffered during World War II and the various mergers that took place over time, it is unlikely that many more archives exist and are accessible.

[26]The Kleinwort archive is very incomplete for the interwar period, with most of the correspondence and information books missing. Therefore my conclusions are based on a relatively small amount of information. However, what I have found agrees with Kynaston (1999), who briefly discusses Kleinwort's performance in this period.

did very well during the war, generating large profits that allowed the firm to expand rapidly. The post-war bust which followed in 1920-22 was almost as damaging, with the firm sustaining losses of approximately £1.5m in 1921 alone. Aside from this aspect of the business, the firm continued to be a major player in the South American trade financing market. The bank dealt with all aspects of trade for their customers, and used their City links to arrange shipping and insurance, as well as accepting the merchants' bills. Information remained at the heart of the business, with over 50 different letter series running at any one time. These letters transferred local information about conditions, clients etc back to London for the firm to use.

The Great Depression hit the firm (and the rest of the City) hard, leading to a collapse in profits. With falling prices a reflection of falling demand, times were hard for the firm and its clients, "ALPACA: There seems to be no bottom to this market for the present..." (Letter from Valparaiso, 14th June 1932)[27]. Although trade did recover in the late 1930s, it was soon all but stopped by World War II, leaving the firm very vulnerable in 1945.

The continuity in Gibbs' business from the pre-war era is strikingly clear from the archive. The linkages between firms and the workings of the London network also appear to be unchanged. In a letter dated 20th January 1928, the London office passes on information regarding a potential client (Henry Simon Ltd) that a partner had gathered from another bank. Clearer evidence is given in a letter regarding the withdrawal of Frederick Huth & Co from South America in 1931[28] "From what we have written from time to time the rumour referred to by you will not really have surprised you..."[29]. This is very strong evidence that the City network is functioning as it did before the war, and in this case is modifying bankers' perceptions of Huth's reputation.

Kleinwort's interwar experience differed slightly to Gibbs, but the continuity from the pre-war period is still there. The firm's accepting business was particularly hard hit by the disruptions of the war and its immediate aftermath due to their strong connections and specialisation in Central and Eastern Europe (in particular Germany). The outbreak of war nearly bankrupted the firm, and only intervention from the Bank of England to support their accepted German bills kept them afloat (Kynaston 1999). These problems

[27]Document is held at the Guildhall Library, London, reference no. MS16877.

[28]Both letters are held at the Guildhall Library, London, reference no. MS16882.

[29]Sayers (1976) describes the Bank of England's attempts to rescue Huth's following poor decisions just before and during the war. The rescues dragged on for nearly 15 years into the 1930s, and it is likely that the withdrawal from South America was an attempt to rationalise. Given how damaging being rescued was for a firm's reputation, Montagu Norman (the Governor of the Bank of England at the time) tried to keep it quiet, but didn't succeed.

continued after the war, and the Great Depression almost completely finished the firm's accepting business off.

In contrast to Gibbs, the firm did diversify and move into a new area; foreign exchange dealing. The floating of rates in the 1920s and 1930s created opportunities for arbitrage and hedging (despite central bankers' attempt to control the exchange rate), and Kleinworts became a major player in this market[30].

Unfortunately the archive does not allow me to comment on how the firm operated in this period, but it seems likely that trade financing continued as it had before the war. From the ledgers it is clear that the firm's specialisation remained unchanged, and that the links with central and eastern Europe that existed before the war were re-established afterwards. However, it is also clear that the firm did diversify, and take advantage of the new market opportunities. This is not an exact match with the simulation results, but the continuity of trade financing from the pre-war period does agree with the model's predictions.

4.1.2 Capital issuing banks

Unlike the trade-financing banks, the capital issuing banks had to re-focus or drastically reduce their size in the interwar years. As has already been alluded to in the literature review, New York's chance to move into capital issuing during the war, combined with the Bank of England's restrictions on capital exports (see Section 4.2) left these banks with very little of their pre-war business. Unfortunately the archive sample does not include any of the smaller houses that participated in issuing, but even among the 'big guns' the interwar years were hard.

CJ Hambros escaped very lightly compared to most, due to a combination of being one of the largest issuing banks and a fortuitous merger with the British Bank of Northern Commerce (an accepting bank) in 1920 that led to the bank moving into trade financing. Up to 1913, Hambros specialised primarily in issuing bonds and securities for Scandinavian countries and cities (the firm also did some issuing for Italy and Greece). The house grew to completely dominate Scandinavian issues , and by 1913 they were one of the largest issuing houses in London. The war brought Hambros into trade dealings; the firm worked with the British Bank of Northern Commerce as the government's agents in the resource-rich Nordic countries.

As well as making the shift towards trade financing very clear, the archive also highlights how New York was able to move into the issuing business.

[30] As one of the largest merchant banks operating in London, Kleinworts had the capital and reputation to quickly establish themselves in this market.

Throughout the war Hambros had to turn business away and send it to New York, for example in 1914 it had to turn down a Danish short term loan (letter dated 17th December 1914[31]) and suggest that the country go to New York. The war-time restrictions on capital exports (designed to keep funds at home to pay for the war effort) presented the firm with a major challenge.

The archive also provides an interesting insight into how the banks used each other's output within their own production function. It appears as though the issuing houses worked together to ensure that the coming to the market of new investment projects was smoothed (as opposed to lots of issues flooding the market). This comes through in a letter regarding the 1913 Gothenburg City Treasury Bill issue[32]. Hambros suggests that the city waits a few weeks before issuing, as they know that a number of other issues are about to hit the market. This information was almost certainly gathered from meetings between the partners of the banks, where current and future 'output' were discussed, and it was in everyone's interests to 'wait their turn' (flooding the market ran the risk of no issue being fully taken up), which would minimise the cost to the borrower and lender.

The changes that occurred in Hambros business model over the war fit with the simulation results. Their take-over of Northern Commerce reduced both the number of firms and the different types of output on offer from the City, and their move into trade financing and away from capital issuing is consistent with the results. It is impossible to say whether the firm merged because it foresaw the problems that were to come in capital issuing, or if it was just lucky. However, the firm had previously declined to merge with Northern Commerce in 1912 (when the outlook in their primary business was much better), which suggests that at least part of the decision was driven by strategic interest. This conclusion is supported by evidence from the Bank of England archives. A letter dated 18th October 1935 from L Huth Walters to the chairman of the Accepting Houses Committee[33] discussed the Chancellor of the Exchequer's position on domestic capital issues, indicating that at least some member of the Committee had now diversified into domestic stock issues.

The second capital issuing firm Morgan Grenfell did not fare as well. Their traditional business, the issuing of American railroad stocks was already drying up in the early twentieth century, and this combined with the shift of issuing to New York hit the firm hard. Although the archive is incomplete, it appears that the partners undertook no major issues during the

[31]Letter is held at the Guildhall Library, London, reference no. MS19088.

[32]Held at the Guildhall Library, London, reference no. MS19201.

[33]A City organisation representing the interests of the merchant banks. A copy of the letter is held at the Bank of England archive, reference no. G14/128.

interwar period. As is discussed further below, the main source of income for the firm appears to have been investment management, as well as investing and arbitraging on their own account. The decline of this house is very clear in the archive, as a letter to New York dated 19th February 1943 shows "I continue to feel that the time may yet come again when our joint prestige over here (London) maybe of value to us in New York.", although they did survive to rebuild after World War II[34].

4.2 The impact of the Bank of England restrictions

The literature provides some information on the extent and effectiveness of the interwar capital controls. Two appendices in Sayers' history of the Bank, give details on the extent and timing of the controls, and I supplement this with evidence gathered from the Bank of England archives, which contains details about how the embargo worked in practice, as well as the opinions of the major players involved.

Sayers' history (Sayers 1976) contains two appendices which are of use. The first of these is a transcript of Montagu Norman's evidence to the Macmillan Committee on Finance and Industry, convened in 1929 (Appendix 21, Sayers (1976)). When specifically asked about the capital controls used in the 1920s, Norman reports that although the merchant banks did forego issuing opportunities, the embargo itself was not successful as private investors still sent their money abroad, as private individuals. Norman also reports that the main reason for imposing this embargo was to maintain the exchange rate, i.e. to help with the resumption and then maintenance of the gold standard parity.

Appendix 30 of Sayers supplements the Macmillan Committee Minutes, and charts the course of these exchange embargoes. For the early 1920s, the official treasury restrictions from the war were continued, except for Dominion borrowers. By 1925 even these loans had to be stopped as the final push to return was attempted. Although the restrictions were formally relaxed in 1926, Norman informally continued pressuring the banks throughout the later 1920s, until the re-imposition of formal controls in 1931.

For the purposes of the model, this is an important point, as it suggests that the banks had to severely curtail their issuing business in this period, at Norman's request. This is clear support of the simulation results, but it doesn't provide any details. How restrictive was the embargo? Were all issuing houses affected, and to what degree? To answer these questions, I use documents from the Bank of England archive. These document both the

[34]A copy of the letter is held at the Guildhall Library, London, reference no. MS28186.

chronology of the embargo and the impact it had on the merchant banks.

The early 1920s, when London's share of capital issues was 44%[35] appear to be a relatively calm period. The governments in both Britain and America banned any issues to war combatants that had not settled their war debts, and in practice this covered most of Western and Central Europe. As a result, despite there being an informal embargo on short term foreign loans from London[36], where foreign did not include empire countries, there is no evidence of the City firms being badly affected.

However, evidence from later years on the impact of the embargo indicate that New York gained substantially from London's inability to issue. Borrowers were still demanding money, and it is clear from the capital export data that British investors were willing to invest. The embargo merely prevented issues from being undertaken by British merchant banks, and in some cases foreign borrowers were advised to go to New York "Konig: Loan to Austrian Railways: Anticipation advance of 2m...to be spent on machinery here. I say Loan seems very uncertain and too remote at present for such an advance, should go to NY rather than London."[37]. It is also clear that the embargo affected all of the issuing houses, "I have had the pleasure of conversations with several firms and persons who have been in especial degree concerned in the purchase or placing in this Market of Foreign Securities or Issues, and I am satisfied that they will endeavour to co-operate in promoting this policy..."[38].

Despite the embargo, it is clear that the authorities are concerned with the amount of capital moving abroad. Norman's diary entry regarding a meeting with Reginald McKenna (16th April 1924) notes "... 2. Foreign Loans, he agrees we have overlent: our only remedy a 5% rate, which must be used if such loans continue on large scale..."[39]. This gives an indication of what was to come (continued restrictions and the eventual banning of issues), and the fact that without the embargo London would have been a

[35]Calculated from data reported in United Nations (1949).

[36]The embargo covered any loan with a maturity less than 20 years; "You are aware that for the past couple of years it has been the express wish of successive Chancellors of the Exchequer that no Issues of short-term Foreign Loans should be made in London." (letter from Norman to the chairman of the Bankers' Clearing House association, 1st Feb 1922), held at the Bank of England archive, reference no. G1/349.

[37]Taken from Norman's diary entry for 6th Feb 1925, held at the Bank of England archive, reference no. ADM34/14.

[38]Quote taken from a letter dated 29th April 1925 from Norman to the Stock Exchange Committee members. A copy of the letter is held at the Bank of England archive, reference no. G14/128.

[39]Taken from Montagu Norman's appointments diary held at the Bank of England archive, reference no. ADM34/13.

major issuer.

Norman's primary concern in the early 1920s was the return to the gold standard, and he clearly recognises that capital issues increase the amount of sterling in the market and make this more difficult. The return to gold in 1925 is accompanied by a complete ban on any foreign issues, and restrictions on empire loans, and although this is lifted in November 1925, informal restrictions continue throughout the 1920s. This becomes more problematic over time, as this quote from a letter from Erlangers to the Governor (dated 1st March 1927) indicates:

"Whilst it is quite natural that no Loan should be raised directly for the French Government as long as the war debts are not settled and the United States follow the same policy, may I venture to suggest that in other French business our policy is only depriving the City of legitimate and handsome profits without in any way benefiting us. The Loans are officially issued in Amsterdam, Switzerland and New York. The commission is earned there whilst England always proves to be a heavy subscriber and subsequent large purchaser."[40]

Although this letter is in reference to the particular embargo on French loans (due to the war debt issue), it does indicate that the merchant banks were becoming increasingly frustrated with losing business to other financial centres, particularly when private investors were circumventing the embargo anyway. A further example of the impact of the embargo can be gathered from correspondence between the banks JS Morgan and Lazard Freres and the Bank; "Informal enquiry has been made of Messrs.Lazard Freres as to whether there is any likelihood that a looan of, say, up to 5,000,000 by means of an issue of French Government Treasury Bills in London of a currency of twelve months or less would be permitted."[41]. The letter asking for permission for this issue is dated 13th February 1933, and two days later Norman notes on the correspondence that the request has been declined. Both of these letters provide clear evidence for our theoretical results; that the embargo was a binding constraint on the City, and that New York in particular benefitted from the diversion of business.

To weather the storm of the 1929 crash followed by the crises of the early 1930s, Norman instigates an outright ban on all foreign issues (and eventually extends this to empire issues) in 1929; "The unofficial embargo on foreign loans is still in force, and is not likely to be removed in the immediate future" (from the Morning Post, 29th Dec 1929). This ban continues throughout the 1930s, but interestingly it is still a constraint. The historical literature tends

[40]Extract from letter held at the Bank of England archive, reference no. G1/349.

[41]Extract from letter held at the bank of England archive, reference no. G1/350.

to highlight this period as protectionist, with investors being unwilling to invest abroad as they are worried about defaults etc. This does not appear to be the whole story, as merchant banks were still approaching the Governor to issue capital after the early 1930s crisis; "With reference to our conversation when you called here on Friday last, my subsequent enquiries do not, I regret to say, enable me to hold out any prospect of any such relaxation of the 'embargo' on foreign issues as would permit you to undertake such an operation on behalf of Egypt as you had in contemplation." (letter from Norman to Erlangers, dated 3rd April 1933)[42].

Although demand was undoubtedly reduced following 1929-32, the bankers believe that there is still a market, and again the embargo is the restriction. Although New York is not issuing large amounts of capital in this period, the continued restrictions on London would have reduced the size and power of the City's linkages and network, leaving it even more vulnerable to competition following World War II.

In summary, the embargo appears to have been a significant constraint throughout the interwar period. In terms of the theoretical model, this is clear support for the prediction that a bigger shock than World War I was needed to transform the industry, and give New York the 'leg-up' it needed. This point was noted at the time, as this quote from The Times (14th April 1931) shows; "Although both America and France have the means to satisfy the borrowing requirements of foreign countries, they have not the experience, habit, or machinery to take the place of Great Britain as the world's lender.". Although this is a general comment about the country, part of it is the City of London's built-up ability and network that allowed it to issue capital at the lowest possible cost.

Tieing this into the wider macroeconomic literature on the return to gold, it is clear that the decision to return to gold was more disastrous than is currently thought. As Sayers (1976) and others since have shown, the overvalued exchange rate damaged Britain's competitive position throughout the 1920s, restricting output and employment, particularly in industrial outer Britain. This literature however assumes that the City benefitted from the resumption of the fixed exchange rate and the financial stability this brought. My results suggest that this was not the case, at the very least for the merchant banks that concentrated on capital issuing. The return to gold had a negative impact on the long run position of the City, contributing significantly to London's decline and New York's rise in the interwar years.

[42]Letter held at the bank of England archive, reference no. G1/350.

4.3 Home bias in demand

An alternative explanation for New York's rise that has so far not been discussed or addressed is the role of home bias in demand for international transaction services. Cassis hints at this by arguing that New York rose up as a result of its shift from borrower to lender, implying that individual investors are only happy investing through their 'home' financial centre (Burk 1992, Cassis 2006). Although I do not investigate the importance of this explanation within the theoretical model, I can assess its validity using the archive evidence.

Kleinwort had close links with Goldman Sachs, and during the interwar period offered their British (and possibly European) customers the opportunity to invest in the booming American stock market. Kleinwort would deal with the customer and manage the investments from London, by buying and selling through Goldman Sachs. In this way, Kleinwort was able to offer access to New York but deal with customers at home. The fact that British and European investors were willing to pay for this indicates that there was home bias in their demand, but it is also indicates that investors wanted to achieve the best returns and would invest in foreign markets.

The Morgan Grenfell archive also provides evidence of home bias. In the same way that Kleinwort offered access to the American market to clients, Morgan did via J P Morgan, their sister (and by now dominant) firm in New York. It seems as though investors preferred to deal with a British bank rather than try to establish connections in New York, despite the extra cost of accessing the market. Again, this indicates both home bias (consumers preferred the banks in their own countries), but also a willingness to send money to the market with the best rates of return.

My findings in the merchant bank archives are supported by documents found in the Bank of England. A draft report published by the Overseas Loan Committee in 1925 notes that "if the appetite of the American investor for foreign securities grows substantially, as would appear probable, (New York will grow in stature)", strongly indicates that at least part of the growth of New York was driven by demand. However, in reference to the informal embargo on capital issues in London in the 1920s, the committee notes that: "It was never supposed that these restraints could, even if it were desirable, be more than a temporary expedient. The opportunities for evasion (of which purchases through agents of securities issued e.g. in the United States of America is a prominent example)..."[43]. This clearly highlights the fact that

[43]Both quotes are taken from the Overseas Loan Committee's first draft of report on overseas issues and the return to Gold, held in document G1/386 at the Bank of England archive.

private investors were quite happy to send money to New York for investing if London could not oblige, and that investing through home banks was not a major concern of the average investor.

The evidence therefore gives some qualified support to Cassis' liquidity-driven explanation, that New York grew as a result of home demand for foreign issues in particular. However, this is clearly not the whole story. Investors were willing to buy securities in a number of different markets, and coupled with this the embargo was a binding constraint that resulted in banks turning away business and sending it to New York.

5 Conclusion

I have argued that the key mechanism behind New York's rise as a financial centre was World War I and the disruption that followed it. Although the literature has also noted this fact, it has so far failed to theoretically explain why the shock triggered the changes seen in the industry. Using an increasing returns to scale model, I have filled this gap, and shown that the war itself was not enough of a shock; the continuing informal (and later formal) embargo on capital exports from Britain played a crucial role in reinforcing the gains New York made between 1914 and 1918. This implies that the external economies associated with the City of London were extremely strong and persistent, and that the City was the productivity leader in this sector throughout the interwar years.

Coupled with this, the results suggest that economic hegemony does not go hand-in-hand with possessing the world's leading financial centre. Although Britain gave up economic leadership in the late nineteenth century, it was not until 1945, when the effects of two world wars and severe curtailment on the City's operations by the authorities, that New York was able to overhaul the City. The persistent nature of informal information networks and linkages between firms make incumbents extremely hard to challenge, in both 1918 and the present day. An extremely large shock, such as World War I and its aftermath, was needed to dislodge London from the top.

Finally, I am also able to challenge the traditional view surrounding the return to the Gold Standard in the 1920s. For the security-issuing merchant banks, the imposition of an embargo designed to support the currency resulted in their competition moving in and stealing their former markets. For this group of City men, the return to gold was actually damaging in the long run, suggesting that current estimates of the damage done do not fully capture how disastrous this policy was for Britain.

6 Appendix

6.1 Consumption function

The utility function for consumers is built up using nests of the general Dixit-Stiglitz preference-for-variety functions presented in Section 3.1. The top nest is a standard Cobb-Douglas utility function, where the output from financial services (TF and KI) enter into the function along with income (Y). Below this, the first nest combines the same financial services output (trade financing (TF) or capital issuing (KI)) with an elasticity γ. In the simulations, I set this elasticity to be high, that is the same output from different locations is very substitutable. At the bottom level, the preferences are Dixit-Stiglitz over output from the same location. Consumers like the variety they get from differentiated output, and substitute between these different varieties with elasticity σ.

$$
\begin{aligned}
U_k &= Y_k^{1-2\alpha} TF_k^{\alpha} KI_k^{\alpha} \qquad (6)\\
TF_i &= [(TF_{ik})^{(\gamma-1)/\gamma} + (TF_{jk})^{(\gamma-1)/\gamma}]^{\gamma/(\gamma-1)}\\
KI_i &= [(KI_{ik})^{(\gamma-1)/\gamma} + (KI_{jk})^{(\gamma-1)/\gamma}]^{\gamma/(\gamma-1)}\\
TF_{ii} &= [\sum^{nTFi} z_{ik}^{((\sigma-1)/\sigma)}]^{\sigma/(\sigma-1)}\\
TF_{ji} &= [\sum^{nTFj} z_{jk}^{((\sigma-1)/\sigma)}]^{\sigma/(\sigma-1)}\\
KI_{ii} &= [\sum^{nKIi} z_{ik}^{((\sigma-1)/\sigma)}]^{\sigma/(\sigma-1)}\\
KI_{ji} &= [\sum^{nKIj} z_{jk}^{((\sigma-1)/\sigma)}]^{\sigma/(\sigma-1)}
\end{aligned}
$$

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