



INDUSTRIAL POLICY AND PRODUCTIVITY GROWTH IN FASCIST ITALY

by

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Abstract

The first chapter - *Crisis? Which Crisis?* - constructs a new series of industrial value added at constant (1938) prices for Italy, for the period between 1928 and 1938. The data employed are shown to be better indicators of the dynamic of the Great Depression than those used by Carreras and Felice (2010) and allow to substantially revise the profile of the Crisis. The contraction appears to be more pronounced and persistent, placing the Italian experience more in line with that of other industrialised countries.

The second chapter - *The Italian Climacteric* - presents new estimates of total factor productivity growth for Italy over the Fascist era and compares them with analogous ones for the pre-World War One period and for Germany and Britain. Because of the absence of a fully reliable GDP series, a dual growth accounting framework is employed. This approach permits the incorporation of new data on land rents and of new evidence on the returns to human capital. Results show that during the interwar era Italy experienced a “climacteric”, defined as a cessation of TFP growth, which compares poorly with the coeval performance of Britain and Germany. This disappointing result contrasts vividly with what occurred in the late liberal Italy, when TFP grew less quickly than in Germany, but faster than in Britain.

The third chapter - *A Tale of Two Fascisms* - offers the first quantitative assessment of labour productivity dynamics within the Italian industrial sector and of their links with Fascist competition policy. We argue that the institutional context in which Italian firms operated and, in particular, changes in the level of product market competition had a significant effect in determining their productivity performance. By relying on a new dataset and on new labour productivity estimates, we show that the earlier more liberal period of the Fascist era was characterised by a true productivity boom, which ended following the switch to a more interventionist industrial policy. Panel data evidence shows that reductions in the level of competition in the industrial sector were associated with lower productivity growth, while changes in industrial structure were a less significant factor.

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Chapter 1

Introduction

Italy has become the Mecca of political scientists, economists and sociologists, who flock to Rome to see with their own eyes the organisation and working of the Fascist corporative state.

Gaetano Salvemini, 1936, p. 10

In his critical appraisal of the Fascist regime's economic policy, the historian Gaetano Salvemini could not refrain from describing the global frenzy Benito Mussolini's rhetoric had created around his experiment. In an age of economic turbulence such as the interwar era, corporativism - a system whereby the government would continuously mediate to solve conflicts between capital and labour - was an appealing solution for many governments which were all too aware of the failures of capitalism and, yet, all too scared of the risks of socialism. The quest for the Holy Grail of a

“third way” meant that, following the Fascists’ March on Rome of October 1922, a wide range of observers was drawn to the Italian capital to monitor closely what the former schoolteacher turned dictator had in mind and was able to deliver (Matthews, 1945; Chabod, 1961; Schlesinger Jr, 1959-65; Palla, 1991).

The policies pursued in “new” corporative Italy were wide-ranging. In agriculture, the *Duce* launched his battles “for wheat” and “for land reclamation” (Cohen, 1973; Cadeddu, Lepre and Socrate, 1975; Corner, 1975; Tattara, 1978). Such campaigns were originally meant to promote a process of ruralisation of the economy which, in fact, never occurred¹. This policy objective was soon *de facto* replaced with an attempt to modernise the industrial sector, through intrusive industrial policy targeted at favouring the newer industries of the second industrial revolution (Covino, Gallo and Mantovani, 1976; Tattara and Toniolo, 1976; Petri, 1997a). With this aim in mind, and in the hope of shielding businesses from the Great Depression, the regime also limited product-market competition, promoting concentration and cartelisation and restricting the entry of new firms into the market (Vito, 1961; Gualerni, 1976; Federico and Giannetti, 1999; Giordano, Piga and Trovato, 2011). As the mixed banks Italy had traditionally relied on for its development were dismantled, the government replaced them with the state-run *Istituto per la Ricostruzione Industriale* (IRI), a body through which the regime could pursue its own, independent industrial policy (Toniolo, 1980; Petri, 2002). After an initial attempt at reducing tariffs, trade policy also became more protectionist (Federico and Tena, 1988b), culminating into

¹Between the two census years 1921 and 1936, the percentage of the labour force employed in agriculture actually fell from 59% to 52% (Broadberry, Giordano and Zollino, 2011).

autarky, which followed the imposition of sanctions by the League of Nations' after the invasion of Ethiopia in 1935 (Tattara, 1985; 1988). Despite Mussolini's rhetoric, however, the autarkic shift failed to transform Italy into a planned economy in the same way as Germany, largely because of the incompetence of the regime (Toniolo, 1980). As for the distribution of income, the slow growth of wages led to a worsening in the conditions of the working class (Zamagni, 1976; 1993a). Social progress was also halted following the reform of the education system pursued by the Neo-Idealist philosopher Giovanni Gentile. The reforms he introduced aimed at and managed to reduce the number of students accessing the higher levels of education, lowering the enrolment rates particularly in the scientific and technical curricula (Zamagni 1993b; Vasta, 1999; A'Hearn, Auria and Vecchi, 2011).

The intellectual pilgrimage triggered by this policy overhaul outlasted the demise of Mussolini in 1945 and generated three different intellectual debates which are yet to be fully resolved. The first one concerns whether the policy changes introduced by the regime were sufficient to produce a clearly identifiable "Fascist" economy, or if, as the title of Gianni Toniolo's (1980) seminal book on the period reads, there was just an "economy of Fascist Italy". The second one is centred around the issue of "continuity" and implies understanding *a)* whether the economy of the time marked a caesura with the development path followed by Italy since its unification and *b)* whether or not it was a springboard for the post-World War Two Golden Age. The third and final debate relates to the question of whether the economic policies pursued at the time marked a success in the Italian growth experience or led to nothing

short of an economic failure.

The primary interest of the three essays composing this dissertation is the third one of these questions. Our overall argument is that, far from being capable of promoting productivity growth and insulating the economy from the Great Depression, the Fascist era marked an abrupt stop in the development process of the Italian economy. This view, which is broadly consistent with a range of studies published in the late 1970s and early 1980s (Ciocca and Toniolo, 1976a; Toniolo, 1980), goes against a recent revisionist literature which has rehabilitated the economic record of the regime and offered a more benign assessment of the impact of its policies. In particular, Chapter 2 - *Crisis? Which Crisis?* - challenges the idea recently put forward by Carreras and Felice (2010) that the Great Depression in Italian industry was “light and quick”. Chapter 3 - *The Italian Climacteric* - argues against the view that the economy of the time was capable of generating technical progress, as argued in a range of studies by Petri (1997a; 1997b; 2002). Finally, Chapter 4 - *A Tale of Two Fascisms* - shows that the industrial policy pursued by the regime largely hindered labour productivity growth in the secondary sector, rebutting the view by Bardini (1998) that the main fault of Fascism was not pushing these policies far enough. The scope of this work, however, goes beyond challenging the views expressed in the fore-mentioned articles. The quantitative evidence presented in those papers, in fact, offers indirect support to the thesis that fascism was a ‘developmental dictatorship’ (Gregor, 1979), that ‘in a consistent and coherent fashion promoted economic growth and modernisation under the aegis of an interventionist state and

a self-sufficient economy' (Cohen, 1988, p. 110). The aim of this thesis is to get the cliometric record straight, to avoid the rebirth of this interpretation and the subsequent *rettung*² of Fascist economic policy.

Since the "failure" question dominates much of this thesis, the other two issues outlined above remain largely outside the main body of this work. Yet, these are questions which are important to refer to briefly at the beginning, so as to clarify the viewpoint from which the rest of the analysis is conducted. Tackling these issues in this Introduction will also allow to only briefly refer to them in the main body of the work. For these reasons, this Introduction is structured as follows. Section 1.1 offers a brief outline of where this thesis stands in the debate on whether or not one can identify a "Fascist" economy. In Section 1.2, we address the "continuity" thesis. In particular, we argue that, if one does not focus on the structural elements of the Italian economy and instead concentrates on economic policy, the period after 1926-7 should be seen as a caesura from the earlier Fascist era and from the pre-World War One age. Lastly, in Section 1.3, we describe the methodological approach used in the dissertation and present the core of the argument of this thesis. After outlining in more detail the contributions of the three chapters comprising this work, we present our overall case for "failure". In this Section we also address the issue of how this re-examination of the economy of Fascist Italy contributes to our understanding of the overall Italian economic development in the era between Unification and World War Two.

²This is the "rehabilitation" the neapolitan philosopher Benedetto Croce had warned against as early as in the 1940s (Croce, 1963).

1.1 A “Fascist” economy?

In order to claim that the regime was capable of creating and imposing a new “Fascist” economy on Italy, one must necessarily agree with two statements. The first is that the Fascists designed a coherent and original economic plan, which was different from what the country had experienced in the past and from what other non-Fascist states were experiencing at the time. The second is that the regime had sufficient control over the country to be able to impose this new vision on the different economic players. In other words, agreeing with this second statement means proving that Italy was what has been defined a *totalitarian* state, or, to use the expression of the historian Emilio Gentile, an example of *totalitarian caesarism*, ‘a charismatic dictatorship of the caesarian kind, integrated into an institutional structure based on a single party and on the mobilisation of the masses’ (Gentile, 1995, p. 22).

Rather than engaging in a lengthy discussion on the intellectual history of Fascist economic thinking³, we address this issue on the basis of the second premise. In other words we ask whether or not Italy was an example of totalitarian caesarism. Paradoxically, this statement is denied by much of the existing work on totalitarianism. Ever since the concept was formalised in the work of Arendt (1951) and Friedrich and Brzezinski (1956), it was mainly applied to the experiences of Nazi Germany and Communist Russia. Fascist Italy was, in fact, only seen as an imperfect example because of the smaller size of the masses involved in the totalitarian experiment, so

³Such a discussion would be outside of the scope of this work. For a detailed account, see Griffin (1991); Eatwell (1995); Payne (1995) and Gregor (2005).

that Italian Fascism was defined as a ‘simple nationalistic dictatorship, which was born from the difficulties of a multi-party democracy’ (Arendt, 1951, pp. 357-8).

This view, which would deny the second premise to the argument that there was a “Fascist” economy, has been duly rejected by Gentile, for whom the “fascination” produced by the Fascist culture led to the “sacralisation” of politics, the nationalisation of the masses and, ultimately, the creation of a truly totalitarian state (Gentile in Bosworth, 1998, p. 235). This relatively recent socio-political argument follows a more strictly economic one, presented by the American conservative historian James Gregor. In his view, Fascism was a totalitarian state because of the economic policy the regime decided to pursue. To Gregor, Mussolini’s regime was a ‘mass-mobilising, developmental dictatorship, animated by clearly totalitarian intentions’ (Gregor, 1979, p. 321). Its economic policies were based on a coherent and consistent theory of modernisation and aimed to promote economic growth through capital accumulation, funded through the suppression of wages and salaries. Business interests were given a free reign until circa 1926, when their interests stopped coinciding with those of the state. Despite their occasional resistance, the views expressed by the entrepreneurs were then largely subordinated to the developmental grand plan orchestrated by the regime, which succeeded in creating in Italy a “Fascist” economic system.

The standpoint of this dissertation is that this view is fundamentally flawed. Even if one concedes that there was a sufficient amount of original economic thinking be-

hind the policies designed by the Fascists⁴, their originality was largely thwarted by the continuous negotiations occurring between the regime and the industrial elite. In this bargaining process, an important role was played by the *Confederazione Generale dell'Industria Italiana*⁵. Following the decision by the regime to recognise it as the official and sole representative of all industrial employers vis-à-vis the government and the unions, Confindustria could enjoy ‘the autonomy of a private pressure group and the powers of a public agency’ (Sarti, 1971, p. 4)⁶. Although the corporative model required significant negotiations between the regime and the industrialists, the autonomy maintained by Confindustria succeeded in watering down most policies passed by the regime, so that Italy never became a totalitarian state.

Although it is beyond the scope of this thesis to give a full account of these negotiations⁷, it appears useful to describe one such instance, as this will allow us to prove the point that the regime was not able to impose its policies on all the existing economic agents. The example we choose is the complicated negotiations

⁴This is, by no means, a settled issue. In fact, much of the existing literature has downplayed the originality of Fascist economic thinking. See, in particular, Cohen (1988), who has convincingly argued that there is hardly any evidence that Fascism had a coherent economic plan. As for Mussolini himself, Mack Smith has duly remarked that he had ‘little understanding and not much interest’ in economic matters (Mack Smith, 1981, p. 117).

⁵This is the Italian entrepreneurial association. From 1st January 1926 Confindustria had to add the word *Fascista* in its name, hence becoming *Confederazione Generale Fascista dell'Industria Italiana* (Castronovo, 2010, p. 202) to then revert to its former name after the demise of Mussolini. For the rest of this work, it will normally be referred to as Confindustria.

⁶The powers deriving from this dual position were not used to serve the interests of all entrepreneurs equally. Since the seats in Confindustria’s general assembly were apportioned taking into account the size of the labour force and the amount of invested capital represented by each member, small producers ended up being systematically discriminated against. This was accompanied by a clear bias in favour of heavy industry, such that light industry became ‘relegated to second-class citizenship’ (Sarti, 1971, p. 16).

⁷For a detailed account, see Sarti (1971) and Adler (1995).

going on between Confindustria and the government over the latter's decision to promote cartelisation during the Great Depression⁸. The process of cartelisation could, in fact, occur either through "obligatory cartels" (*consorzi obbligatori*), or through "voluntary cartels" (*consorzi volontari*). Although Pitigliani (1940) has argued that 'the words "obligatory" or "voluntary" only indicated the larger or smaller degree of control by the state in the organisation of industrial cartels', his interpretation ignores the fundamental difference in the impact of the two measures. With "compulsory cartels", all firms in a given industry would be required by law to join a given cartel. Conversely, with "voluntary cartels", firms would voluntarily decide to join one. This would lead to a less significant reduction in competition and would allow entrepreneurs not to lose the right to manage. The regime was largely in favour of the former solution. In April 1930, Arnaldo Mussolini, the dictator's influential brother, publicly argued in an article published by *Il Popolo d'Italia* that producers should be required by law to join cartels when the national interest could benefit from total participation. This created a dilemma for industrialists, as 'they could not afford to refuse public assistance, nor did they want to risk public regulation by accepting public assistance' (Adler, 1995, p. 419). Their main fear was that "compulsory cartels" could be a first step towards an expropriation of their right to manage production.

In order to solve the dilemma, the industrialists took a very pragmatic position, proving the 'amazing flexibility' in their relationship with the regime which has been

⁸This policy change is at the heart of Chapter 4 of this thesis.

hailed by Sarti (1971, p. 5). Although Antonio Stefano Benni, the then president of Confindustria, had initially rejected Arnaldo Mussolini's idea of "compulsory cartels", when the law was passed, Confindustria did not oppose it but managed to establish itself as the relevant administrative agency. Even though this did not mean becoming the ultimate authority for the administration of the cartelisation process - which was still the *Ministero delle Corporazioni* - Confindustria exploited its technical competence and information-gathering superiority to influence the decisions of the small and poorly staffed Ministry, so that its recommendations were largely rubber-stamped. As put by Adler, 'still very much a "state within the state", the industrial association saw to it that these compulsory cartels were essentially consensual: they would have to represent at least four-fifths of any given sector, and their deliberative assemblies could take action only if two-thirds of the members were present' (Adler, 1995, p. 424-5). As a result, the legislation on *consorzi obbligatori* was effectively transformed into a promotion of *consorzi volontari*. Confindustria was thus able to 'eliminate specific provisions that threatened entrepreneurial autonomy without incurring the charge of ideological heresy' (Sarti, 1971, p. 5).

The discussion around the format the Italian *consorzi* had to take exemplifies why Italian Fascism cannot be defined as a totalitarian developmental dictatorship. Even admitting that Mussolini's regime had a coherent economic plan, this was not implemented. For this reason, it is therefore impossible to talk of a "Fascist economy" as such. This is the point of view taken by Toniolo (1980) who specifically avoided

talking of a "Fascist economy" throughout his *magnum opus* on the subject⁹, as well as by Whittam, who specifically identified the regime's excessive closeness to the industrialists as the reason why one cannot talk about "Fascist" economic policies. 'Mussolini waged "battles" - Whittam wrote - but was always reluctant to challenge the opinions of big business. [...] Whereas the workers' position had been weakened, leaving them vulnerable to dictation by the state, the employers gained in strength and had powerful allies in the government. Only if Mussolini had been ready to launch a "battle" for the corporations would a viable corporative system be established' (Whittam, 1995, pp. 60-3) and the idea of a Fascist "third way" would have become something more significant than a rhetorical device.

1.2 Continuity or change?

The previous Section has argued that Fascist Italy was not a totalitarian state. This means that, even by making the far-fetched assumption that there was a coherent "Fascist" economic plan in Mussolini's mind, its implementation fell well short of its alleged design, largely because of the autonomy retained by the industrialists. This consideration explains why this thesis will not refer to the economy of the time as a "Fascist" economy, but, rather, will define it as the Italian economy during the Fascist era.

⁹'In the entire volume, I avoided talking specifically of a Fascist economy as such, and I doubt whether a Fascist economy can actually be found' (Toniolo, 1980, p. xii).

A different question is whether one can think of the reforms pursued by the regime as a caesura. In other words, this means asking whether these policies *a)* marked a significant break from those which had been implemented in the pre-World War One era and *b)* differed substantially from those which would follow in the post-World War Two Golden Age¹⁰. These two issues are somewhat related, as identifying a clearly distinguishable "Fascist" economy would have implied that a break with both periods was, indeed, present. Yet, even though there was little which was inherently "Fascist" in most of the policies pursued in Italy during the 1920s and 30s, it does not follow that the interwar era might have not been marked by a regime shift. It is eminently plausible, in fact, that although the policies pursued in those years had little in them which was inherently "Fascist", they might have still been sufficiently different from what preceded and followed them to justify the case for a caesura.

In the existing literature, support for the "continuity" view has grown strong over the years and now characterises both positive and negative accounts of the economy of Fascist Italy. Gianni Toniolo, whose assessment of economic performance of Fascist Italy is largely negative, has emphasised the presence of an underlying continuity in the structures and in the development path of Italian capitalism, which makes it

¹⁰This debate mirrors an earlier one which has taken place in the political - rather than economic - historiography of the early post-World War Two period. Some scholars, led by the philosopher, Benedetto Croce, saw Fascism as a "parenthesis" in Italian history, that is as a phenomenon which was unrelated to the late 19th and early 20th century liberal era and largely due to a sudden "moral sickness" which was caused by World War One and by the fears of a communist revolution (Croce, 1963). Conversely, others have seen Fascism as the unavoidable consequence of the belated political development of Italy (Mack Smith, 1959). Although this latter view of Fascism as a "revelation" has been successfully rebutted (Chabod, 1952; Maturi, 1962), even the Crocean school has been forced to acknowledge the presence of links (the so called "germs" or "motives") between the interwar era and the liberal age (Antoni, 1944).

difficult to identify a caesura in the Fascist era. To Toniolo, ‘the low level of *per capita* income and the consequent limitation of the size of the Italian market, the high elasticity of labour supply, the strong tendency towards international openness and the presence of a sectoral and geographical dualism are among the main interpretative keys to understand the aggregate aspects of Italian economic history in all the liberal, Fascist and immediate post-World War Two eras’ (Toniolo, 1980, p. x). This perspective is mirrored in Rolf Petri’s (2002) more positive account of the Fascist period. In Petri’s view, there is a substantial continuity between the economic policy of the 1920s and 30s and the one of the post-war Golden Age. Petri defines the period between 1918 and 1962 as the years of industrialisation, which only ended when industrial output and employment overtook the corresponding agricultural indicators¹¹. Industry underwent an important modernisation process and some branches of manufacturing - mainly chemicals and the utilities - developed some fundamental innovations, whose timing enabled Italy not to be left behind in an era of significant technical change (Petri, 1997, pp. 245-7). If the Italian economy did not fully take off in the 1930s, this was because of four factors: overpopulation, the slowdown in international trade, lack of raw materials and excessive dependence on foreign imports. ‘When, in the 1950s, these knots were undone, the structural movement of the economy underwent a decisive acceleration’ (Petri, 2002, p. 28).

On this particular question, this dissertation tends to differentiate itself from this

¹¹Although Italian industrial output was higher than Italian agricultural output since the first half of the 1920s, it was only in the second half of the 1950s that industrial employment overtook agricultural employment comprehensively.

more mainstream view. The chronological focus of this work on the era between the 1890s and the 1940s makes it impossible to fully address Petri's argument that there were some strong links between the pre- and the post-World War Two policies. Yet, it allows us to make the case for the presence of a discontinuity between the liberal and the Fascist eras. Arguing the case for a caesura is not necessarily opposed to what has been stated by Toniolo. Rather, it involves a shift of focus from the structural elements he emphasises to economic policy and, in particular, to industrial policy, which we see as changing substantially circa 1926-7.

In order to fully appreciate the magnitude of this change, one should first discuss how a revisionist school is now arguing that the Italian path to development before World War One was much less state driven than it had been assumed. Regardless of their assessment of its impact, economic historians of liberal Italy had, in fact, long been convinced that industrial policy had significantly shaped the development of the Italian economy in the late 19th century. In particular, Gerschenkron (1962) had criticised the choice made by the government to protect textiles, arguing that mechanical engineering would have been a better choice. Bailouts and state purchases were also seen as important. The decision by the *Banca d'Italia* to coax the main Italian mixed banks into organising a rescue of the two major steel companies, ILVA and Piombino, was seen as a way to influence development by promoting the companies belonging to the so-called "military-industrial" complex (Confalonieri, 1982). Furthermore, the preferential treatment given to the domestic producers of

the rolling stock¹² had meant that, between 1885 and 1904, Italian companies could supply about three-quarters of railway equipment, but that these products were paid, on average, 15-20% more than the foreign one (Papa, 1973).

In more recent work, however, Federico (1996) and Federico and Giannetti (1999) have underlined how a wide range of individual studies on the issue appear to be all minimising the role played by the state in shaping the early phases of Italian economic development. Research by Federico and Tena (1998b) has shown that Italian duties were not particularly high by European standards¹³. Work by Toniolo (1977) has shown that the impact of the duty on steel on industrialisation was, overall, quite small. State purchases in the so-called “military-industrial” complex were also relatively limited, with railways procurement only accounting for around 10% of total value added of engineering and steel products (Fenoaltea, 1982a). Finally, industrial bailouts occurred with a much less pronounced frequency than what would happen during the Fascist era. These considerations have led Federico (1996) to suggest that Italy before World War One followed a “Mancunian” path to industrialisation. This was characterised by a relatively limited level of state intervention in the economy which favoured, in particular, the more traditional industries located outside the “military-industrial” complex. The firms of these sectors displayed a remarkable proficiency in adapting foreign machinery (Giannetti, 1994) and in exploiting the low cost of labour to exploit modern labour-intensive technology (Federico, 1996). These

¹²Since 1882 national suppliers were given an automatic right of preemption on state purchases, provided their bids did not exceed the lowest foreign offer by more than 5%.

¹³They hardly ever exceeded 25% – 30% and were often around 15%.

characteristics allowed them to increase their competitiveness both domestically and abroad.

Given this new interpretation of the Italian government's policy stance before World War One, the caesura between the late liberal and the Fascist eras appears all the more evident. Although there was no clearly identifiable Fascist economic policy, the Italian government's approach to industrial policy changed substantially. This theme, which is central to this dissertation, is mainly developed in Chapter 4. This chapter argues that, in line with what occurred in other European countries, this discontinuity began with World War One, when the Italian government started to favour the newer industry of the second industrial revolution more decisively (Caracciolo, 1978b). This initial discontinuity did not last very long, though, as the years immediately after the end of World War One were marked by a decisive switch to pre-World War One policy instruments. Such a switch ended in 1926-7, when the regime decided to rejoin the Gold Standard at a parity of ninety lire to the pound.

The return to gold marked the beginning of a new phase for Italian industry. As it will be discussed at greater length in Chapter 4, the new exchange rate favoured the inward-oriented heavy sectors, at the expenses of the export-intensive light industries. Trade policy also played a role. While the years after World War One were marked by a generalised decrease in industrial tariffs, these started to increase around the years of *Quota 90* so as to promote a progressive process of import-substitution. This process gathered speed during the years of the Great Depression

when, however, it became increasingly clear that tariffs were an insufficient policy instrument to promote the growth of the domestic heavy industry (Toniolo, 1980). An ever more important role was then played by exchange controls, which became important in the 1930s, when Italy started to sign up to a number of international clearing agreements. In 1935, the government created the *Sovrintendenza agli scambi e alle valute*, a body whose primary role was to distribute to importers the scarce means of payment. As emphasised by Guarneri (1953) - who was picked by Mussolini to lead this body - these were allocated favouring heavier industry at the expenses of lighter one.

The caesura occurring around 1926-7 is also evident in the realm of competition policy. Chapter 4 emphasises the effectiveness of the laws aiming at promoting concentration and cartelisation in reducing product-market competition, particularly for what concerned the so-called new industries. The creation of the *Istituto per la Ricostruzione Industriale* (IRI), which occurred in 1933, completed this process. Having acquired all the shareholdings from the three main Italian mixed banks¹⁴, IRI controlled 21.5% of all the capital belonging to joint-stock companies in Italy. Its creation marked a significant discontinuity with the past: while the Italian government had previously acted as lender of last resort to bail out banks, it had never used these bailouts to pursue an independent industrial policy (Toniolo, 1980).

These policies do not appear sufficiently different from what was occurring else-

¹⁴These were the Credito Italiano, the Banca Commerciale Italiana and the Banco di Roma.

where in the world to justify the view that there was much originality in Fascist economic policy, at least in international terms. The retrenchment from competition occurred in a range of countries, including the United Kingdom (Foreman-Peck and Hannah, 1999) and the United States (Roos, 1937), and the Nazi regime was also heavily involved in the planning of the German economy - to an extent which was far superior to the one displayed by Mussolini's government (De Grand, 1995). Yet, Fascist industrial policy marked a discontinuity from both the pre-World War One era and the early 1920s, an age when a more "Mancunian" type of development was pursued. This caesura offers an interesting contrast for historians as well as economists.

1.3 Success or failure?

If examining any historical period from an economic point of view is always a risky task, using this approach when analysing a dictatorship is almost inevitably bound to attract criticism. On the one hand, one can be accused of using an excessively reductionist approach, when, in fact, no economic gain can ever justify the human costs imposed on a society by years of fear and violence, in which freedom is severely limited and human rights denied¹⁵. On the other hand, a researcher may run into the opposite risk of letting his *a priori* condemnation of the regime influence his

¹⁵This worry must have accompanied the scholars publishing the first cliometric assessment of the economy of Fascist Italy, who felt compelled to declare their anti-Fascist views at the end of the introduction to their 1975 volume: 'Those who have participated in this research do not all have the same ideological beliefs, but are united in their anti-Fascist commitment and think that they can contribute through research to a meaningful celebration of the 30th anniversary since the fight for the Liberation of the country' (Ciocca and Toniolo, 1975b, p. 341).

historical and economic analysis. This was the preoccupation of the most prolific and best-known historian of Fascist Italy, Renzo De Felice, when he launched his famous neo-Rankean “*ad fontes*” appeal. His aim was to invite researchers to simply write the history of Fascism, without letting their political or ideological bias emerge through their interpretation of facts (De Felice, 1983, p. 253)¹⁶.

The methodology used in this thesis aims to avoid incurring this second risk. One of its contributions lies in the large collection of new historical data. All three papers are based on newly compiled datasets, which have involved original archival research. This is, in a sense, a cliometric response to the De Felicean “*ad fontes*” exhortation, which can limit a range of aprioristic biases. As emphasised by Ciocca and Toniolo (1976b, p. 16), by providing a range of new statistical material, this work can offer a contribution even for those readers who do not share the approach here taken or the conclusions here drawn.

Navigating away from Scylla, however, vastly increases the chances of crashing into Charibdys. Following the path traced by the pioneering work in Ciocca and Toniolo (1975a), this work is very much anchored in the cliometric tradition. The history of individual firms or entrepreneurs is not directly addressed in this thesis and the same applies to the more socio-historical aspect of what living under the dictatorship was really like¹⁷. The risks of being accused of taking an exces-

¹⁶For a criticism of this approach, see Bosworth (1998, pp. 236-7).

¹⁷This is an area where the study of Fascist Italy has severely lagged behind that of Nazi Germany or the USSR. See Bosworth (1998, pp. 31-2).

sively reductionist approach are compounded by the decision to choose, within the range of possible cliometric studies, an approach which is largely macroeconomic and, therefore, only tangentially interested in questions such as what happened to living standards and to the relative impoverishment of certain classes. Yet, it is precisely the choice of such a reductionist approach that can strengthen the case for failure which is made in this work.

There is, in fact, a generalised consensus that Fascism was an era of slow social progress and falling living standards¹⁸. The debate has now moved towards whether the sacrifices imposed on the Italian people were a price worth paying for development. A core argument of this dissertation is that, *even if* one takes a reductionist approach and mainly looks at more macroeconomic indicators, this was not the case. Our analysis starts from taking a new look at three indicators - total factor productivity (TFP) in the economy, industrial value added and labour productivity in industry - and argues that, despite what has been stated in a set of more recent works, the policies pursued during Fascism were a failure at large.

To go into the detail of the individual chapters, Chapter 2 - *Crisis? Which Crisis?* - argues against the view that the Great Depression in Italian industry was a ‘quick and light’ one. This stance, which has its roots in the contemporary propaganda by the regime, has been supported by the controversial first generation of Italian national accounts (Fuà, 1978). More recently, the second-generation series

¹⁸For an excellent review, see Zamagni (1993a, pp. 303-17).

produced by Carreras and Felice (2010) have reinstated this view, confirming that industrial value added fell by an amount which was considerably smaller than in other European countries and claiming that the recovery started as early as 1932. Chapter 2 presents a new series of industrial value added at constant (1938) prices for Italy, for the period between 1928 and 1938. The data employed are shown to be better indicators of the dynamic of the depression than those used in Carreras and Felice (2010). Because of data limitations, more work will be needed to fully integrate the new series in the long-run series of the Italian national accounts. However, despite the limitations in the sectors covered, the new series substantially revise the profile of the Great Depression. The contraction appears to be more pronounced and persistent, confirming the doubts of the pessimists (Toniolo, 1980) and placing the Italian experience more in line with that of other industrialised countries.

Chapter 3 - *The Italian Climacteric* - presents new estimates of TFP growth for Italy over the Fascist era and compares them with analogous ones for the pre-World War One period and for Germany and Britain. Its aim is to distinguish between the view that Fascism was successful at promoting technical growth (Gregor, 1979; Petri, 2002) and the one stating that Mussolini's regime actually hindered it (Toniolo, 1980; Cohen, 1988). Because of the absence of a fully reliable GDP series (Fenoaltea, 2010), a dual growth accounting framework is employed (Hsieh, 1999; 2002). This approach permits the incorporation of new data on land rents, and of new evidence on the returns to human capital, so as to analyse the role played by two factors of production so far neglected in the literature. The results show that

during the interwar era Italy experienced a “climacteric”, defined as a cessation of TFP growth, which compares poorly with the coeval performance of Germany and Britain. This disappointing result contrasts vividly with what occurred in the late liberal Italy, when TFP grew less quickly than in Germany, but faster than in Britain.

Chapter 4 - *A Tale of Two Fascisms*¹⁹ - offers the first quantitative assessment of labour productivity dynamics within the Italian industrial sector and of their links with some aspects of Fascist industrial policy. We argue that the institutional context in which Italian firms operated and, in particular, changes in product market competition had a significant effect in determining their productivity performance. By relying on a new dataset and on new labour productivity estimates, we show that the earlier, more liberal period of the Fascist era was characterised by a true labour productivity boom, which ended following the switch to a more interventionist industrial policy. This result, which is robust to the inclusion of data on the number of hours worked, leads us to investigate the impact of changes in competition policy on labour productivity growth. Adapting a model by Broadberry and Crafts (1992) to a panel of Italian industrial branches over the 1921-1951 period, we show that reductions in the level of competition in the industrial sector were associated with lower productivity growth, while changes in the industrial structure were a less significant factor.

There are quite clearly epistemological limits in defining any period as a “success”

¹⁹This paper is jointly written with Claire Giordano, *Divisione Storia Economica e Finanziaria, Banca d'Italia*.

or a “failure”. It is unclear against which benchmark a period should be assessed, whether there were alternative courses of action with the *then* available information and whether these were always practicable. This notwithstanding, the picture emerging from the next three chapters suggests that the Italian economy during the period performed worse than what recent scholarship had so far believed. Overall, the Fascist era should therefore be seen as a phase of severe slowdown in the process of catching-up undergone by the Italian economy throughout the 150 years of its existence. The policies pursued in those years did little to promote productivity growth and were no better at insulating the economy from the Great Depression than those attempted elsewhere in Europe. The implications of this failure view are wide-reaching. In particular, they question the stance that the state had a positive role to play in encouraging economic development in the backward Italian economy and, in particular, in its industrial sector. In this respect, this thesis supports the argument recently made by Federico that ‘Italy developed more thanks to “the animal spirits of capitalism” than to Gerschenkronian substitutes’ (Federico, 1996, p. 780). Its small and medium enterprise, which was largely swept aside by the coalition of Confindustria industrialists and the regime, could have done more for Italy’s economic development than the big state apparatus which triumphed during the interwar era. This last consideration shows that there are more lessons to be learnt from the period than the simplistic one that Italy should avoid undergoing another dictatorial phase. The impact of the complicated coalition formed between large industrialists and the state should warn against the risks associated with an excessive closeness between these two economic players. Toniolo’s decision to describe the industrialists

in the period using Federico Caffé's definition of 'lazy capitalism' (Toniolo, 1980, pp. xiv) appears entirely justifiable. Although competition should not be seen as an unquestionable totem, Italy risks more by tampering with it than by letting flowers bloom.

Chapter 2

Crisis? Which Crisis?[†]

2.1 Introduction

The Great Depression in Italy has been a largely understudied period. In their study on unemployment during the 1930s, Toniolo and Piva (1988) talk about the historiography on the Great Depression as ‘an infant industry’, since ‘the number of books and paper explicitly dealing with it is probably within the single figure range’ (Toniolo and Piva, 1988, p. 231). In particular, little consensus has been reached on the seriousness of the crisis, particularly with regard to the industrial sector, with two sides, which we shall label as the “optimists” and the “pessimists”, battling each

[†]*I am grateful to Brian A’Hearn for encouragement and very helpful suggestions and to Alberto Baffigi, Albert Carreras, Emanuele Felice, Alfredo Gigliobianco, Claire Giordano, Anna Missiaia, Gianni Toniolo and Vera Zamagni, as well as to the participants to two workshops at the Bank of Italy, for the useful points they have raised. Finally, I am thankful to the staff of the Biblioteca Paolo Baffi, of the Biblioteca della Consulenza Giuridica and of the Archivio Storico of the Bank of Italy. The usual disclaimer applies.*

other over this question¹. The main problem with this debate is that, while the arguments put forward by the pessimists appear particularly convincing, much of the evidence present in the literature on the Italian national accounts has tended to confirm the view of the optimists. In particular, the new series of value added in the industrial sector which has just been published by Carreras and Felice (2010) supports the view of a “quick and light crisis”, a result which is also visible in the first-generation estimates.

This essay aims to solve this puzzle by producing a new series of industrial value added at 1938 prices for the industrial sector. The series draws on the second generation series produced by Carreras and Felice, but offers substantial revisions for a range of industrial branches, accounting for around half of the value added produced by the industrial sector in 1938. Since no value added data were recorded until the 1937-9 industrial census (IC), my revisions are based on the usage of different indicators from those employed by Carreras and Felice. In particular, we revise the estimates of those branches whose profile is reconstructed using data on the apparent consumption of raw material by the industry or on consumption of what is produced in the industry. These are shown to be weak indicators, as they are either based on unreliable data or on a methodology which is inappropriate for the period.

Because of data limitations, more work will be needed to fully integrate the new

¹Ciocca and Toniolo (1976b, p. 9), talk about the ‘uncertainty in the historical and political literature on the intensity of the 1929 crisis’. Toniolo (1980, p. 139) underlines how ‘the opinions on the size of the crisis in Italy strongly disagree with each other, while a monograph on it is still missing’.

series in the long-run series of the Italian national accounts. But the revisions presented in this paper substantially revise the profile of the Great Depression. The contraction appears to be more pronounced and persistent, confirming the doubts of the pessimists and placing the Italian experience more in line with the one of other industrialised countries. The presence of a second dip in 1936, which was found by Carreras and Felice is confirmed, though it appears to be caused by a fall in the construction industry rather than by a contraction in manufacturing.

The structure of the paper is as follows. Section 2.2 reviews the evidence presented by the optimists, paying particular attention to the existing literature on the Italian national accounts and showing how this supports the view of a quick and light crisis. Section 2.3 presents the evidence of the pessimist field, outlining how the opinion expressed by contemporary commentators, evidence on the legislation passed by the regime and labour market statistics are all hard to square with the estimates presented in the national accounts. Section 2.4.1 looks inside the second-generation estimates by Carreras and Felice, outlining their limitations and explaining why these series need to be revisited. Section 2.5 presents the new estimates for the individual branches. Section 2.6 presents a revised series for value added during the period, showing how the crisis was deeper and longer than previously found, while Section 2.7 concludes. The Appendix provides a full description of the methodology used to construct the new series, describes in detail the employment data used in some sections of this work and presents tables with the new series.

2.2 Which crisis? A light and quick one

2.2.1 The regime's propaganda and the optimist historians

The view that the Italian industrial sector was able to withstand the Depression better than other developed economy has its roots in the propaganda of the time. The regime actively used the crisis as a way to portray corporativism as a superior economic model, which was able to shield the Italian economy from a shock of exceptional magnitude better than any other system. The regime was, therefore, often talking about the crisis in comparative terms, making it clear that if Italy was suffering, others were suffering way more.

This picture emerges clearly from *Informazioni Corporative* (Inf. Corp.), an official publication from the *Ministero delle Corporazioni*, containing the reactions of the Fascist hierarchy to the development of the economic crisis. The January 1931 issue quotes a speech by the *Ministro delle Corporazioni*, Giuseppe Bottai, who states that ‘a quick examination of the international repercussion [*of the Crisis*] suggests that the industrial sector in other countries has suffered more than ours’. Unsurprisingly, to Bottai, the cause for this difference can be found in the “new” economic model devised by the Fascist hierarchy and consequently adopted by Italy. To Bottai, ‘the liberal-individualistic system of production is the biggest responsible of the economic crisis [...] in the free-market regimes, production was left to private coalitions [*and*] the application of the new methods of production occurred without any concern for the superior interest of the collectivity’ (Inf. Corp., April 1931, pp. 25-6). Con-

versely, the Italian industrial sector could benefit ‘from the order and social cohesion brought to Italy from the Fascist regime. The action of the central government and the collaboration which has intensified among the different factors of production, helped to better focus and stimulate the efforts of the industrial resistance’ (Inf. Corp., January 1931, p. 26).

Fascist propaganda targeted, in particular, the United States, where the crisis had been remarkably severe. The periodical *Critica Fascista*, set up in 1923 by Giuseppe Bottai, stated that the severity of the slump in the United States could be explained because this country lacked a unifying “race, stock and history” (Di Marzio, 1930). The newspaper *Gioventù Fascista* went as far as stating that, in January 1933, ‘a once wealthy but now wretched American immigrant had turned up in Naples’ trusting in the hospitality of the Italian people and in the generosity of the *Duce* (Bosworth, 2005, p. 272). The comparison between the United States and Italy served to show that the regime was doing what was needed to keep the country out of the downturn. As recounted by Bosworth (2005), the leading journalist Luigi Barzini Sr., claimed that the events in the world economy were proving that ‘Italy is [always] right’. Italian commentators went as describing Franklin Delano Roosevelt as a Fascist, who had recognised that an interventionist and corporative state was the only rational exit from the Depression (Bosworth, 2005).

Following the demise of Mussolini, a range of historians insisted in claiming that the view that Italy had withstood the Great Depression better than other countries

in the world was not just propaganda. The leader of this school of thought has been the historian Gualberto Gualerni, who openly praised the corporativist structure of the Italian economy. To Gualerni, the great success of this model had to do with the fact that neither the State had appropriated the industrial sector, nor the industrial sector had relinquished its independence to the government. The symbiosis was way more complex and, for that matter, successful. The results obtained by the corporatist structure ‘were not negative and produced better results than one may think’ (Gualerni, 1976, p. 83). Rather than only praising corporativism, however, Gualerni also spent some words for other aspects of the regime’s industrial policy. In particular, he emphasised the positive role played by the regime shift which occurred following the decision, in 1926-7, to rejoin the Gold Standard at an exchange rate of 90 lire to the pound. This led to a decisive move towards a more concentrated and cartelised industrial sector² which, he argued, was better equipped to cope with the 1929 crisis. In praising the actions of the Fascist government, Gualerni remarked how ‘Italy suffered less abruptly from the crisis, as the industrial sector had been re-organised since 1927’. This reorganisation occurred through ‘a range of policy interventions which revealed themselves to be useful to face and overcome the new difficulties’ (Gualerni, 1976, p.78).

2.2.2 The Italian national accounts

The views expressed by the optimist school find substantial support in the existing Italian national accounts. The first-generation estimates at constant (1938) prices,

²This move is carefully accounted for in Chapter 4.

which was produced by the group led by Fuà (1978) on the basis of a series at current prices built by the Italian Statistical Office in 1957 (ISTAT, 1957a), show that value added in the industrial sector between 1929 and 1932 fell only by 13%³. This figure appears much smaller than the ones available for other countries. The size of the contraction in Italy was larger than in the Netherlands and in the United Kingdom (−6.1% and −11.4%, respectively), but lower than in France and Belgium (−25.6% and −27.1%) and significantly more limited than in the USA (−45.2%) and in Germany (−40.8%)⁴. As the ISTAT figures also show that most of the contraction happened by 1931, this would confirm the stance that depression in Italian industry was relatively light and quick.

Unfortunately for the optimist field, this evidence is far from conclusive. This is because of the bad reputation enjoyed by the ISTAT-Fuà series, which is essentially due to two sets of reasons. The first one concerns the many inconsistencies found in the series with respect to the period of liberal Italy (Fenoaltea, 2010), which have also thrown a shadow on their ability to describe Italian development in the later period. The second one concerns the lack of transparency and of clarity in the explanation of the methodology used to construct them, which is particularly evident for the series at constant prices presented by Fuà (1978)⁵. Furthermore, since Fuà's series lacks an explicit disaggregation of the manufacturing sector into different branches, it is

³This figure excludes the construction industry.

⁴These estimates are presented in Carreras and Felice (2010) and are obtained by the authors re-elaborating the OECD (1955) figures. All these figures exclude the construction industry.

⁵The original work produced by ISTAT (1957a) provide some details on the sources used and on the methodology followed.

impossible to assess the plausibility of the individual series forming it.

The skepticism towards the existing series has led to their progressive revision. Thanks to the work of a number of researchers, coordinated, on behalf of the Bank of Italy, by Guido Maria Rey (1992; 2000), benchmark estimates of value added for the agricultural, industrial and service sectors for the years 1891, 1911, 1938 and 1951 were produced, with Fenoaltea (1992; 2000a; 2000b) and Fenoaltea and Bardini (2000a; 2000b) producing the relevant benchmarks for industry. While the 1911 estimate was combined with a range of branch-specific series constructed by Fenoaltea (1972; 1982b; 1986; 1987; 1988a; 1988b), so as to form a new series of industrial value added at constant prices covering the entire 1861-1913 period (Fenoaltea, 2003a), a similar exercise was not undertaken for the interwar years. Following the completion of the 1911 benchmark, Rossi, Sorgato and Toniolo (1993) produced a new series of GDP for the period 1890-1991⁶. However, the cycle used for the period in between 1911 and 1951 was, the "old" one from ISTAT-Fuà⁷.

Following this study, it became increasingly clear that the next contribution to be made was a series which would include the new benchmarks for 1911 and 1938 and would replace the old cyclical component with a new one which was accurate,

⁶The scholars also employed a benchmark estimate for 1951 as obtained by Golinelli and Monterastelli (1990).

⁷Another series was constructed by Angus Maddison (1991; 2003), who recalculated the growth of the Italian economy for the period 1861-1989, producing two series at constant (1985 and 1990) prices. The series accepts the revisions for the pre-World War One period made by Fenoaltea. However, despite these improvements concerning the industrial sector, the data for the service and the agricultural sectors were still the same as for the ISTAT-Fuà series. The series relative to the interwar years were also unchanged.

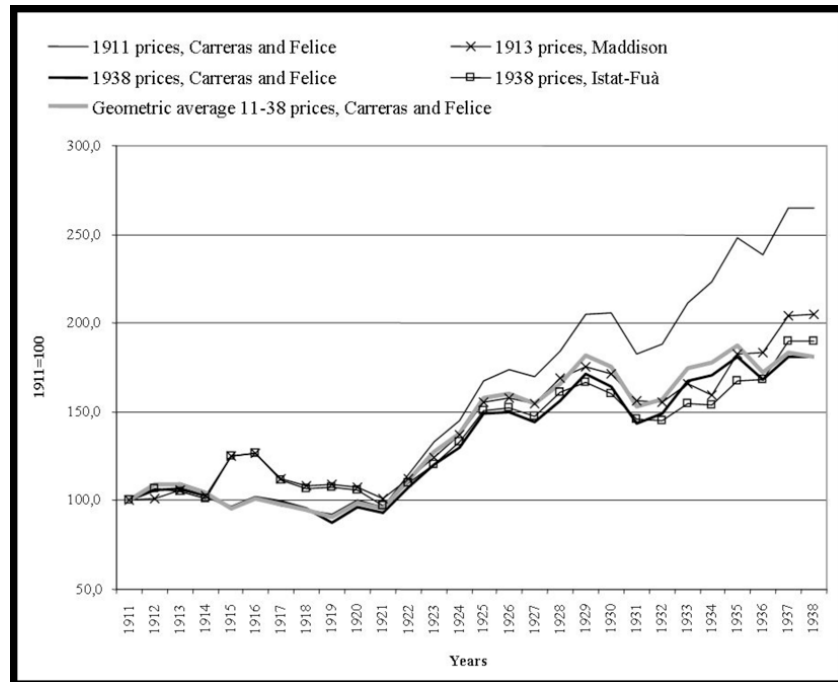


Figure 2.1: Industrial value added in Italy, 1911-1938

Source: Carreras and Felice (2010)

reproducible and falsifiable. In this respect, the recent work by Carreras and Felice (2010) has filled an important gap in the literature. Carreras and Felice expand Albert Carreras' doctoral thesis⁸ to provide the first set of estimates of industrial value added for the period between 1911 and 1938 which are not based on the ISTAT-Fuà cycle. The new series, reproduced in Figure 2.1, contributes to our understanding of the evolution of Italian industry over the period between 1911 and 1938 in three different ways. Firstly, the new series reduces the growth rate of Italian industry during World War One, a finding which had puzzled economic historians for many

⁸The thesis (Carreras, 1982) has remained unpublished. However, large sections of the work were published in Carreras (1999).

years⁹. Secondly, it emphasises the reorganisation undergone, since the late 1920s, by the Italian secondary sectors, a reorganisation which favoured the more capital intensive branches¹⁰. Thirdly, and most importantly for the present paper, the new estimates substantially confirm the profile of the Great Depression depicted in the old ISTAT-Fuà series¹¹. As far as the size of the crisis is concerned, Carreras and Felice find that, between 1929 and 1932, industrial value added at 1938 prices, excluding the construction industry, fell by 15.3%. This figure is very similar to the one found by ISTAT-Fuà (13%) and confirms the view that the crisis in Italian industry was less severe than in the secondary sectors of other developed economies. As far as the length of the depression is concerned, the new estimates find even less persistence than the old ones by ISTAT-Fuà. While the old ISTAT-Fuà series showed a substantial stabilisation of the crisis in 1932, with total industrial value added falling by less than 1% over that year and value added in manufacturing remaining practically stable, Carreras and Felice show that the recovery had already started, albeit slowly, in 1932. These figures confirm the view that the depression in Italian industry was relatively light and quick. They also offer some indirect support to the claim that the reforms introduced by the Fascist regime had succeeded in making the Italian secondary sector more resilient to economic crises than the one of other industrialised countries.

⁹For a criticism of the original series, see Broadberry (2005). For details on the possible reasons behind the spurious growth spurt, see Carreras and Felice (2010, pp. 8-9).

¹⁰Such a reorganisation could not be seen in the old ISTAT-Fuà series at constant prices, as this series did not disaggregate the manufacturing sector into its different branches.

¹¹The authors find the compatibility between the two sets of estimates ‘encouraging’ as they claim that ‘towards the end of the 1920s and of the 1930s, ISTAT sources and its methodology become more accurate and more refined’ (Carreras and Felice, 2010, p. 30).

2.3 Which crisis? A long and deep one

Despite the support found in the national accounts, the view taken by the optimists did not remain unchallenged. Some historians, like La Francesca (1972), agreed with the claim that the crisis had not been particularly deep, but motivated their position differently from Gualerni. To La Francesca, far from proving the innovativeness of the corporativist system, the limited magnitude of the contraction was due to Italy's economic backwardness¹². A more substantial challenge has, instead, come from a range of other historians, which we shall label as the "pessimists". This field, whose leader has been Gianni Toniolo, has gone as far as rebutting the statement that the crisis had been relatively modest. In a section of his seminal contribution, *L'economia dell'Italia fascista*, Toniolo (1980) expressed his skepticism towards the ISTAT-Fuà series and preferred to rely on a different series produced by the OECD (1955), which showed how output in manufacturing fell by 25%. For Toniolo 'the crisis of the manufacturing sector was very severe and comparable to the one of the most severely hit European countries, with deep consequences for occupational levels' (Toniolo, 1980, p.145). The impact on the economy was far-reaching. 'Considering that the expansion of the productive capacity and technical progress usually takes place in the industrial sector, [*such a severe crisis*] must have had repercussions on the subsequent growth potential of the entire system' (Toniolo, 1980, p.146).

The position expressed by Toniolo is supported by three sets of evidence. The first one is the impression of contemporary commentators, whose pessimism filters

¹²Italy benefitted from 'having a less developed economic system' (La Francesca, 1972, p.45).

vividly despite the cautious checks imposed by the regime on official commentaries. The second one is the sense of urgency manifested by the regime during the early 1930s, which appears hard to square with the optimism of the Fascist propaganda. The third one derives from labour market statistics, which are hard to reconcile with the pattern described by the “optimists” and by the national accounts . In this Section, we proceed to discuss each point in turn.

2.3.1 Contemporary commentators

The views expressed by some contemporary commentators can provide helpful guidance to define the exact timing of the depression. In particular, because of their relative independence from the regime, the observations of some economists and of industrialists¹³ provide a range of noteworthy insights in the conditions Italian industry was in at the time. As one reads their statements, a useful exercise involves following their timing and comparing it with the profile of the crisis depicted in the national accounts. When this comparison is made, it is, in fact, much harder to take an excessively optimistic stance on the length of the depression. In particular, the view that the year 1932 marked the beginning of the recovery appears particularly unconvincing.

It is, in fact, clear that industrialists were particularly impatient about the beginning of a recovery. On the 22nd of January 1932, speaking to the yearly general assembly of Confindustria, its president, Antonio Stefano Benni, described 1931 as a

¹³As we saw in Chapter 1, they generally maintained a relative degree of autonomy from the regime. See Sarti (1971) and Adler (1995).

year which had been once ‘welcome as bearer of more optimistic news’ and which in fact had ‘shown itself to be more difficult than 1930’. Had 1932 been characterised by the beginning of the recovery, one would have almost certainly observed some enthusiasm in the statements of the Confindustria officials. Yet, this was far from being the case. At the beginning of 1932 Benni could only remark how ‘the greater part of firms is obliged to work at loss or with very low margins’ (Inf. Corp., February 1932, p. 157).

Informazioni Corporative does not say much about the second half of the year, when the industrial sector might have recovered strongly enough to compensate for the fall in output of the first few months of the year. Yet, other coeval sources do not support this view. The January 1933 issue of the *Bollettino di Notizie Economiche*, a monthly publication released by the *Associazione fra le società italiane per azioni* (Assonime) and containing a thorough review of the economic conditions in Italy and in the world, supports the view that, for the whole of the economy, the second half of 1932 saw a stabilisation of the crisis, but no recovery¹⁴. This was deemed true for the economy as a whole as well as for the industrial sector. In this case, however, the *Bollettino* underlined the asymmetric impact of the recession¹⁵. Among the branches which were suffering the most, the *Bollettino* included mechanical en-

¹⁴‘A careful analysis of the performance of the different sectors of our economy throughout 1932 allows us to state that, while the first semester was characterised by a continuous fall of all economic indicators, from July onwards a large majority of them has shown, despite some oscillations, a manifest stability, which has acquired clearer consistency in the last two months of the year’ (Assonime, 1933, p. 1).

¹⁵‘The performance of the Italian industrial sector in 1932 was rather heterogeneous. In some industries, the depression accelerated and discomfort spread greatly. Other industries experienced some improvements, especially in the last months of the year’ (Assonime, 1933, p.2).

gineering, mining and the clothing industry, while the position of the chemical and of the paper industries was generally mildly improving.

This pessimistic outlook on 1932 is also confirmed by the analysis made by the Bank of Italy in an important coeval source, the one-off publication *L'economia italiana nel sessennio 1931-1936*. This three-volume book was a thorough review of the Italian economy of the period, whose aim, explicitly mentioned in the Preface by the then Governor of the Bank, Vittorio Azzolini, was to describe the economic events of Italy during what he defined as 'exceptional times', as well as to describe the developments of the new corporatist order¹⁶. In the chapter of the book which referred to the conditions of the industrial sector, it is stated that Italy experienced 'a long depression which, in the case of industry, touched its deepest point in 1932'. This stance is confirmed by an internal memorandum found in the *Carte Baffi* of the archives of the Bank of Italy. In this document, the years between 1927 and 1929 are define as the 'three-year period of the stabilisation' and those between 1930 and 1932 as the 'three-year period of the crisis'¹⁷.

¹⁶The reliability of the work can be safely assumed on the basis of an internal letter which was found in the archives of the Bank of Italy. In this internal note, it was stated that 'the description of the events should not be an apology. It should present the exposition of facts, whose truth will be guaranteed from the high authority of the Bank of Italy, whose deserved prestige is well known at home as well as abroad. The Governor wants to use this prestige to let, in particular, foreigners know the truth around economic affairs whose exposition has too often been distorted' (Archivio Storico Banca d'Italia, Carte Baffi, Servizio Studi, cart. 3, fasc. 6***, p. 93).

¹⁷Archivio Storico Banca d'Italia, Carte Baffi, Servizio Studi, cart. 3, fasc. 4***, p. 23.

2.3.2 The policy response by the regime

Given the misery which the economy was thought to be in, it is not surprising that several pieces of emergency legislation were passed in 1932. Such laws, which contrast with the bravado about the resilience of the corporatist structure displayed in the official statements, show that the regime was particularly worried about the crisis, which it tried to handle with a certain sense of urgency. The first of the two measures we will outline in this Section is the law on “compulsory cartels”, which was passed in June 1932¹⁸¹⁹. As it was discussed in Chapter 1, this is a different piece of legislation from the general encouragement of voluntary cartels which occurred throughout the 1930s: while firms were not obliged to join a *consorzio volontario* and it was, therefore, possible for non-cartelised firms to compete in the same market as a cartel, every firm was forced to join a given *consorzio obbligatorio*. This imposed an important additional limit to competition.

As it has also been discussed in the Introduction, the effort to promote *consorzi obbligatori* was largely thwarted by Confindustria. Yet, regardless of the limited effectiveness of this measure, it is important to underline how the legislator knew that this was an extremely exacting measure. When the law was discussed in Parliament, parliamentarians knew exactly what would have been its implications for competition. Yet, the relevant Parliamentary Commission ‘was unanimous in recognising that any discussion on principles has to cease whenever the hard laws of necessity

¹⁸R.D.L. 16th June 1932, n. 864.

¹⁹For a more detailed description of the process of cartelisation in Fascist Italy, see Chapter 4 of this thesis.

do not leave alternatives. In a critical phase for the economy, such as the present one, [...] no-one can find it surprising that we have to turn to extreme protectionist measures [...] such as compulsory cartels' (Inf. Corp., April-May 1932, p. 659). As the same source makes it clear, even those who opposed the law conceded that the situation was somewhat exceptional and limited their opposition to demanding that the measure was passed for a limited period only. Their views and those expressed by the parliamentarians in favour of the reform confirm that, far from marking the end of the crisis, 1932 was still a year of severe economic turbulence.

A second set of measures which is worth commenting on is the one concerning public works. It should be emphasised how a campaign of public works had been started before the Crisis hit the country. In particular, the Mussolini Law²⁰ - whose impact will be discussed in Chapter 3 of this thesis - aimed to accelerate the "battle for land reclamation" started by the regime by channelling resources towards the drainage of the Italian marshes. Although this law involuntarily had some fortunate counter-cyclical effects, it was not sufficient to help the economy out of the depression. In fact, its impact was insufficient even in the construction sector. In the April 1932 issue of *Bollettino di Notizie Economiche*, it is, in fact, stated that 'there has been a *further* worsening of the conditions of the construction industry, whose crisis, which had started with some delay compared to other industries is now showing a progressive intensification. In a recent speech at the *Camera dei Deputati* the *Ministro delle Corporazioni* himself has recognised, how the construction

²⁰R.D.L. 24th December 1928, n. 3134.

industry represents the sector of deeper economic depression’ (Assonime, 1932, p. 468). These difficulties led to the intensification of public works and, ultimately, to a second piece of emergency legislation, the winter campaigns of public works. This policy was aimed at creating additional jobs during the winter season, which was characterised by a seasonal fall in employment, which was particularly severe among the agricultural *braccianti* (Toniolo and Piva, 1933, p. 233). Over the 1931-1933 period, more than 60,000 jobs were created, a figure which was sufficient to reduce the unemployment rate in the construction sector by 10% (Piva and Toniolo, 1988). Despite this positive result, their overall effect on the economy remained quite meagre. As it will be discussed in the next Section, the overall rate of unemployment remained stubbornly high despite the fiscal stimulus.

2.3.3 Labour market statistics

The third and final set of challenges presented by the pessimists is based on the difficulty to reconcile data from the national accounts with other economic indicators and, in particular, labour market statistics, which we summarise in Table 2.1²¹, from

²¹Since Italy was under a dictatorship, one could legitimately worry that employment and unemployment statistics might have been manipulated for political reasons. For example, Mack Smith (1981, p. 123) has argued that ‘the manipulation of economic facts was an essential part of Mussolini’s system’. Yet, this does not appear to have been the case. Many of the statistics were collected by Confindustria, whose expertise and relative independence from the government has been emphasised by Sarti (1971) and Adler (1995). More specifically to the case of labour market statistics, Toniolo and Piva (1988) have underlined how the relevant data collection was entrusted to a number of fairly independent local bodies, which were unlikely to manipulate the data. They also add that it would have been difficult for ISTAT to outright manipulate the disaggregated figures coming from those bodies without exposing itself to criticism by the scholarly literature, which was overall quite free at the time. Rather than relying on the manipulation of statistics, the regime preferred to put an embargo on their publication whenever it wanted to hide them from foreign eyes. This happened, for example, during the Ethiopian War: the publication of employment and unemployment statistics was suspended between September 1933 and December 1936 (Toniolo and

Guarneri (1953), Zamagni (1994)²² and Toniolo and Piva (1988).

We first concentrate on the data by Toniolo and Piva (1988), who, for the years between 1931 and 1935, calculate two indicators of unemployment, which they define as a lower and an upper bound²³. These data allow us to say something both about the depth and about the length of the depression. As for its depth, Piva and Toniolo underline how ‘even the lower-bound (official) estimate for the unemployment rate in industry for 1932 is equal to 15.5%, a figure that cannot be dismissed as negligible by the international standards of the time’ (Toniolo and Piva, 1988, p. 230). As for its persistence, it should be noticed that the figures for the unemployment rate shown by Piva and Toniolo reach their maximum in 1932. It could be argued that unemployment is a more sluggish variable than production, implying that a recovery starting in 1932 would not be translated into a significant reduction in unemployment until, at least, 1933. However, the data for 1933 and 1934 go against this hypothesis. The upper bound indicators, which Toniolo and Piva interpret as measuring the average length of a worker’s unemployment spell, remains at roughly the same level

Piva, 1988).

²²The data from Guarneri (1953) and Zamagni (1994) come from the monthly survey of a sample of large firms published in *Bollettino del Lavoro e della Previdenza Sociale* and *Sindacato e Corporazione*.

²³The lower bound is a yearly average calculated on the basis of the official monthly unemployment statistics. It is considered a lower bound since official statistics largely excluded “long term” unemployed, hence underestimating industrial unemployment. The upper bound is calculated by extrapolating a figure for total industrial employment, obtained using the 1937-9 IC and an estimate for the industrial labour force, obtained using the 1936 population census (PC). The final estimate is calculated subtracting the extrapolated employment figure from the extrapolated labour force one. This constitutes an upper bound since ‘the employment figure from the 1937 industrial census is probably underestimated, because of likely underreporting and less than full coverage’ (Toniolo and Piva, 1988, p. 230-231), leading to an overestimation of unemployment.

	Guarneri (1953)	Zamagni (1995)	Piva and Toniolo (1988)				
	<i>Industrial unemployment</i>	<i>Non-agricultural unemployment</i>	<i>Total industrial labour force</i>	<i>Lower bound total U</i>	<i>Lower bound U rate (%)</i>	<i>Upper bound total U</i>	<i>Upper bound U rate (%)</i>
1929	193,585	211,321	-	-	-	-	
1930	296,870	321,988	-	-	-	-	
1931	522,125	568,672	4,594,000	522,000	11.4	1,641,000	35.7
1932	732,009	804,505	4,616,000	716,000	15.5	1,886,000	40.8
1933	714,945	801,124	4,637,000	640,000	13.8	1,885,000	40.6
1934	692,298	776,169	4,659,000	660,000	14.2	1,667,000	35.8
1935	524,753	588,527	4,681,000	538,000 ¹	11.5	1,087,000	23.2
1936	493,160	553,094	4,703,000	-	-	825,000	17.5
1937	520,000	583,196	4,725,000	-	-	357,000	7.9
1938	516,488	579,257	-	-	-	-	
1939	584,865	655,944	-	-	-	-	

¹ Average for the first 9 months

Table 2.1: Unemployment in Italy, 1929-1939

Sources: *Guarneri (1953)*; *Zamagni (1995)*; *Piva and Toniolo (1988)*

in both 1932 and 1933. As for the lower bound figures, which Piva and Toniolo interpret as a measure of the “core” of unemployment, they fall slightly in 1933, but rise again in 1934. The overall message coming from these figures is confirmed by the data by Guarneri (1953) and Zamagni (1994), also presented in Table 2.1. These data show that the level of unemployment reached throughout the 1930s was well above the cyclical trough of 1929. Even the recovery which occurred in the later part of the 1930s was insufficient to bring back the low levels of unemployment reached in the late 1920s. These figures, as well as those from Piva and Toniolo (1988) confirm that there are at least some questions to be asked to those putting forward the idea of a light and quick depression.

2.4 Series? Which series?

The challenges put forward by the pessimist field appear sufficiently well-grounded to confirm that the picture of the Great Depression in Italian industry presented in both the first and in the second generation of the Italian national accounts is overly optimistic. This consideration can lead one to either ignore the estimates and concentrate on different indicators or to revise them. The first strategy was pursued by Mattesini and Quintieri (1997) and Giordano, Piga and Trovato (2011) in their assessments of the Great Depression in Italian industry. Rather than employing the series from the national accounts, they used an alternative index of industrial production, as presented in *Sindacato e Corporazione*, a publication by the *Ministero*

delle Corporazioni covering the period between 1934 and 1943²⁴. Differently from the data from the Italian national accounts, this index shows that, between 1929 and 1932, industrial production fell by approximately 33% and that the recovery only started in 1933. On the basis of this index, Mattesini and Quintieri (1997) state that the experience of the Great Depression in Italian industry was similar to the one of other major industrialised countries. Although the index did not fall by as much as in the United States and Germany, the contraction was larger than in France and Britain. This is a point which is also made by Giordano, Piga and Trovato (2011), who also emphasise how the forementioned index did not go back on trend until 1939, a sluggishness which they attribute to the intervention of the government in both the labour and the product markets.

The strategy of basing one's analysis of the impact of the depression on Italian industry on the index by *Sindacato e Corporazione* is, however, misleading, as this index suffers from two important limitations. Firstly, the weighting scheme chosen to calculate the index appears inappropriate. Weights are, in fact, constructed on the basis of employment data taken from the 1927 IC. This means, for example, that a labour intensive branch such as silk spinning was given a larger weight than another sector such as silk weaving, even though value added produced in the latter sector is much greater. Secondly, the coverage of the index is incomplete. The original

²⁴The data to compile this index were collected from a range of different sources, while the calculations were made by the *Ufficio Studi e Ricerche della Direzione Generale dell'Industria*. The methodology employed to construct the index is first described in the July-August 1934 volume of the publication. The August 1937 volume explains the changes made in 1937, when the coverage of the index was widened and some individual indicators were substituted with more refined ones.

version of the index, published in 1934, only covers six large branches of the industrial sector - textiles, mechanical engineering and metalmaking, paper, construction and utilities. Even when its coverage was expanded, in 1937²⁵, it only included eight branches. The incomplete coverage of a series is a particularly important point, as any series with incomplete coverage, such as the one by *Sindacato e Corporazione*, implicitly assumes that the trends which are peculiar to the included branches can be safely extended to the excluded ones. This may not necessarily be the case. As it has been repeatedly stated by Fenoaltea, this approach may lead to unrealistic results as it makes the overall series depend on the availability of sources at least as much as on the importance of the relative products or branches²⁶.

The two limitations attributed to the index by *Sindacato e Corporazione* render it a very imperfect alternative to the existing national accounts. This is also because the two forementioned problems are avoided by the second-generation estimates by Carreras and Felice (2010). The weights of the individual series of the Carreras and Felice index are based on the value added benchmarks constructed by Fenoaltea (1992) and Fenoaltea and Bardini (2000a) for 1911 and 1938. As for their coverage, Carreras and Felice employ 86 different series relative to all the different branches of Italian industry. Rather than ignoring this series, the most sensible strategy appears

²⁵A detailed summary of the branches covered can be found in *Sindacato e Corporazione*, July-August 1934 and August 1937.

²⁶The only reasonable procedure is reasoning, taking explicitly into account the problem of estimating the cycle of all industries, including those which are not documented [...] With some thinking, one can formulate hypotheses which are better than those implicit in this usually adopted strategy', that is the one of 'rescaling the "measured" sectors to also cover the unmeasured ones' (Fenoaltea, 2006, p. 68).

the one of evaluating the individual series composing the overall industrial one and replacing those which appear less robust. This approach, which is taken in the rest of this paper, must start from a careful examination of the Carreras and Felice series, which is offered in the next Section.

2.4.1 The second generation series

The methodology used by Carreras and Felice to construct their series is the one which has been designed and employed by Fenoaltea in his extensive work on liberal Italy. The main problem which he had to face was the fact that *value added* was first recorded in the official statistics as of the 1937-9 IC²⁷. The absence of reliable statistics on the total value of final products and on the cost of raw materials was overcome for the benchmark years 1891, 1911, 1938 and 1951 thanks to the work by Fenoaltea (1992; 2000a; 2000b) and Fenoaltea and Bardini (2000a; 2000b). However, for the remaining years, no such data exist. The technique employed by Fenoaltea (2003) and also applied by Carreras and Felice (2010) combines physical outputs with estimates of value added referred to a single year, a choice which is mainly based on the technique's minimal data requirements²⁸. In order to construct their series at constant (1911 and 1938) prices, Carreras and Felice employ the 1911 and 1938 benchmarks as their estimates of value added, and combine each of them with

²⁷As it is stated in the report preceding the census and outlining the criteria, methods and norms used to produce it, the statisticians of the time regretted 'the size of the gap for both the national statistics and for the understanding of the industrial structure of the country *deriving* from the lack of an organic system of measurement' of the concept of value added (ISTAT, 1937, p.67).

²⁸As argued by Fenoaltea, the extent of the approximation depends on what 'real value added' actually means. If one follows his interpretation and his critique of double deflation, this construct approximates the desired measure with a smaller error than the more costly double deflated indices. For a lengthier description, see Fenoaltea (1976; 2005; 2006).

86 specific quantity series²⁹.

If one concentrates on the period between 1928 and 1938, which is the one this paper is mostly concerned with, their series at 1938 prices shows a quick and light crisis, characterised by a fall of value added of just over 15% over the 1929-1932 period. As well as the overall series, six out of the ten branch-specific series presented by the two authors show a recovery which is already starting in 1931. Among them there are the mechanical engineering and the textile and clothing industries, two branches whose combined value added in 1938 was equal to over 40% of industrial value added and almost 50% of value added in manufacturing. The series is also characterised by a second dip in 1936, which affects seven of the ten main branches. In particular, the textile and clothing industry suffers from a fall in value added which, in percentage terms, is larger than the one experienced during the entire 1929-1932 period. Large contractions also characterise the mechanical engineering and the timber and furniture industries: in the first case value added shrinks by 12%, while in the latter the reduction is larger than 20%.

There are three possible criticisms of the series. The first one concerns the weighting scheme, which is based on a year, 1938, which could be deemed to be unrepresentative of the economy of the early 1930s. It could be argued that the economy

²⁹They also construct a third series at current prices, using price data from ISTAT (1958) and Cianci (1933). This series, by the authors' same admission, is the weakest one of the three: 'By crossing the quantity series with the price series, we have then reconstructed a third series of value added at current prices [...], undoubtedly the most debatable one' (Carreras and Felice, 2010, p. 6).

portrayed in the 1937-9 IC, on which the 1938 benchmark is based, over-represents the weight of the more capital-intensive branches, which were largely helped by the policies enacted by the regime throughout the 1930s³⁰. An alternative benchmark which could be used instead is 1927, a year in which an industrial census was also held. If one is specifically interested in the Great Depression, she could remark that the economy in 1927 was probably more similar to the one of the 1929-32 period, both because of the temporal proximity and because it had not yet been affected by the industrial policy enacted by the regime as of the early 1930s. To only give one example, the construction series would be very different. Public works would, in fact, have a lower weight since they became more widespread as of 1931, when the government used them as a counter-cyclical measure³¹. Despite the advantages of using 1927 weights, the reconstruction of a new benchmark is a complex task, which is made even harder by the absence of value-added data in the 1927 IC. The only readily available data are those relating to employment, but a weighting system based on employment would create problems which are similar to those underlined for the index of industrial production produced by the *Ministero delle Corporazioni*. For these reasons, although highly desirable, such a refinement will be left for future work.

A similar discussion can be applied to a second methodological criticism, which relates to the choice of ignoring prices. As Toniolo (1980) has warned, this approach

³⁰See Chapter 4 of this thesis for a detailed description of these policies.

³¹This is evident from confronting the index from *Sindacato e Corporazione*, which is based on 1927 weights, and that by Carreras and Felice, based on 1938 weights.

may overestimate the fall of value added during the crisis. This is because ‘the industrial policies adopted in Italy and in many other countries aimed at creating the largest possible gap between the prices of output and that of inputs. This allowed the best organised industrial sectors to reallocate resources in their favour, leaving consumers and primary producers to face the effects of a very severe crisis’ (Toniolo, 1980, p. 145). This is a problem of difficult solution. As Toniolo acknowledges, ‘a precise quantification of the phenomenon is particularly complex [...] This complexity arises from the fact that the analysis undertaken would necessarily have to be led at a level of disaggregation such that it would produce several problems in terms of the availability, reliability and homogeneity of the necessary elementary sources. Furthermore, there would anyway be large distortions due to the usage of any deflator, precisely because of the rapid movement in relative prices’ (Toniolo, 1980, p. 145). For all these reasons, we prefer to also ignore this issue.

We then come to a third criticism, which is the one this paper is mainly concerned with. This relates to the choice of the individual quantity series made by Carreras and Felice. In their work, the two scholars employ direct quantity data only for a range of branches of the industrial sector. For other branches, they rely on a range of proxies which includes data on the final consumption of a given good as well as data on the apparent consumption of raw material. The first indicator, which is employed for some series of the food industry, for the clothing and leather industry, for the timber and furniture industry and the photography and cinema industry, is largely based on the consumption series constructed by Barberi (1961).

These estimates, by admission of the same authors, ‘would deserve to be verified by further research’ (Carreras and Felice, 2010, p. 6). The reason for these doubts are twofold. Firstly, methodological doubts can be thrown on using consumption as a proxy for production in the case of imperishable goods. For these goods, there can be significant temporal distances between the act of production and the act of purchase, particularly during a crisis, when stocks of unsold goods can easily accumulate in shops without rotting. Secondly, the estimates do not appear completely reliable as Barberi is unclear on how he has obtained them (Barberi, 1961, p. 49).

Problems also arise with regard to the employment of the apparent consumption of raw materials, which is used as the relevant quantity indicator for the mechanical engineering and the textile industries. In the case of the mechanical engineering industry, there is a long tradition of employing the apparent consumption of iron and steel to replace missing data on output and value added of a sector whose production is extremely diversified³². Carreras and Felice build on this tradition, expanding their indicator so as to include a wider range of metals, including aluminum, copper and zinc. For the textile industry, the choice is somewhat more original. In some cases, such as silk weaving or wool spinning and weaving, the choice follows the lack of availability of direct production data. In other cases, such as cotton spinning and weaving, direct production data exist, but are ignored³³.

³²See Gerschenkron (1955); Toniolo (1977); Carreras (1982; 1999); Fenoaltea (2005).

³³Their existence is also acknowledged by Carreras (Carreras, 1982, pp. 936 and p. 943), who, however, prefers to rely on the apparent consumption of raw cotton in order to maintain comparability with Spain, a country for which such data are not available.

The possible theoretical problems with this proxy are self-evident. As the authors recognise, the apparent consumption of raw materials ignores changes in productivity³⁴. Furthermore, there could be, within reasonable limits, substitution of some raw materials as inputs in production. Also, the movements in the apparent consumption of certain raw materials could be due to purchases occurring from other sectors. Lastly, there may be idiosyncratic shocks affecting the production of a particular final good in a given sector, which are independent to shocks affecting the market for raw materials. These problems, although present, are not the ones which appear most relevant to this period. In fact, what appears particularly worrying is the possible presence of time lags between the purchase of raw material and the production of the final good which can follow the unexpected fall in the demand for the final product³⁵. In this case, a given raw material is produced by the upstream industry, but is only employed by the downstream industry following a time lag. These problems appear particularly severe during a downturn, when demand for a given raw materials may fall after supply has adjusted and stocks may accumulate (and then deplete).

Such a problem is evident from a careful analysis of the wool industry. The Carreras-Felice series, which is depicted in Figure 2.2, shows that both the wool weaving and the wool spinning industries experienced a boom in 1932 and 1933. Figure 2.2 shows that, between 1931 and 1933, their production rose by 60% and 45%, respectively. This is even more remarkable, as the fall during the crisis had

³⁴It has to be said that by employing the apparent consumption of raw materials, one does not take into account possible variations in productivity' (Carreras and Felice, 2010, p. 5).

³⁵The expectation of the imposition of a tax on a given raw material can have similar effects.

been in the magnitude of 15% and 10% only. This boom is followed by a dramatic bust between 1933 and 1936. In 1936, the value added produced in wool spinning falls by 70%. Such a dramatic boom-and-bust cycle is replicated in the jute industry³⁶, in the linen and hemp industry and in the cotton industry. The reasonableness of these estimates is challenged by the data on employment presented in Banca d'Italia (1938). According to this source, employment in the wool industry fell from 79,400 in 1929 to 69,300 in 1932. It then increased gradually until 1934, when it was just below the level reached at the cyclical peak. This level was barely surpassed in 1935, and was practically equalled in 1936, when it reached 80,000. These data suggest that the 1932-3 boom and the 1936 bust of the industry might have been spurious. The spuriousness of the cycle has to do with the role of stocks. As it was outlined in Banca d'Italia (1938), stocks 'seem to have increased in those two years [*that is, 1932 and 1933*]. Subsequently, following the imposition of import restrictions, the industry seems to have largely drawn from the existing stocks' (Banca d'Italia, 1938, p. 769).

This phenomenon also occurred in other branches of the textile industry. Sources show that during the crisis and until 1934, Italy built up a large stock of raw cotton, which grew from 47,700 tonnes in 1931, to 76,200 tonnes in 1934 (Banca d'Italia, 1938). The decision to import more raw cotton than needed was due to a collapse in its price, which, between 1929 and 1932-5, fell from 9 to 3.90 lire per kilogram³⁷.

³⁶According to Carreras and Felice the 1929-1932 period would see the industry experiencing a fall in value added in the magnitude of 35%, which would then be followed by a 40% rise between 1932 and 1935 and by a 25% fall in 1936 only.

³⁷'Cotton producers, who employed imported raw materials and sold around 75-80% of their

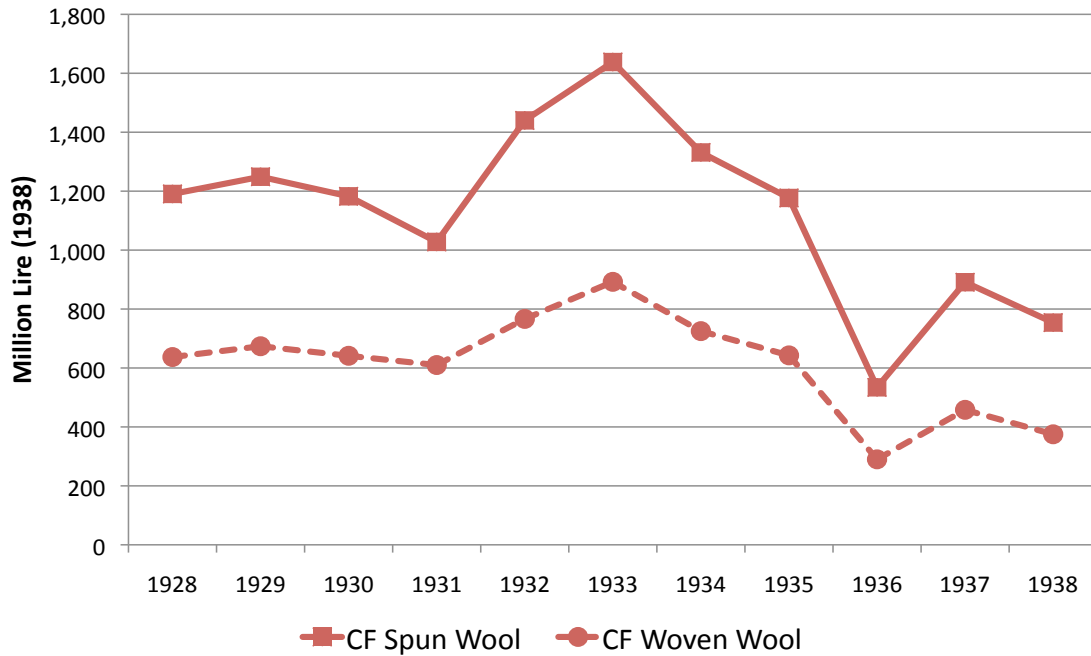


Figure 2.2: Value added of the wool spinning and weaving industries, 1928-1938
Source: Carreras and Felice (2010)

As for the later part of the 1930s, data in Banca d'Italia (1938) show that stocks of raw cotton almost halved in 1935, falling from 76.2 thousand tonnes to 41.2 thousand tonnes in a single year. The cause of this fall, which continued in 1936, can be found in the autarchic policy of the Fascist government and in the introduction of quotas on cotton imports, which happened as of 16th February 1935. Since Italy was a small producer of cotton³⁸, the main way to feed its cotton industry was to run down inventories. This prevented the bust which is present in the Carreras and

production on the national market, despite not obtaining favours from the regime, managed to take advantage of the divergence between the price of material inputs and that of final goods and to limit unit labour costs' (Toniolo, 1980, p. 169).

³⁸Even in 1929, domestic production was just below 1,200 tonnes (Banca d'Italia, 1938, p. 731).

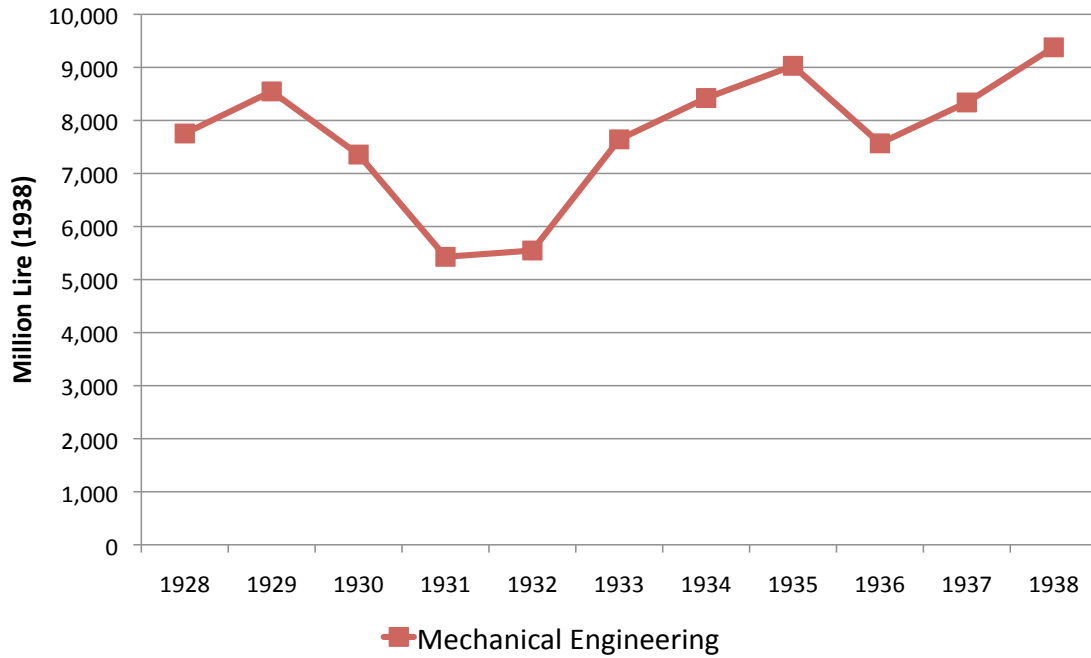


Figure 2.3: Value added of the mechanical engineering industry, 1928-1938

Source: Carreras and Felice (2010)

Felice series. Using the production of raw cotton as a proxy for woven and spun cotton, Carreras and Felice count the cumulation of this stock as if it was employed in production rather than kept in a storage room. This has two consequences. The first one is a spurious reduction of the fall in output experienced during the crisis. The second one is the creation of a further, almost entirely spurious, fall in output in 1935.

The role of stocks also distorts the picture of the crisis in the mechanical engineering industry. The data by Carreras and Felice, presented in Figure 2.3, show that the post-Depression recovery started, albeit slowly, in 1932 and then acquired rapid speed in 1933, when the sector grew by well above 30% in a year. By 1934,

the industry had practically made up all its lost ground, reaching roughly its level in 1929, before experiencing a second trough in 1936. Although there are no available data on stocks to corroborate the plausibility of this thesis, the discussion of the series for the textile industry strongly hints at the possibility that this cycle may be artificially generated by a similar mechanism. By counting raw material which was produced by the upstream industry but not employed by the downstream industry, Carreras and Felice minimise the size of the crisis in the early 1930s. Furthermore, they ignore the fact that when, in 1935, the regime introduced quotas on imports of iron and steel, the engineering industry relied on the stocks of raw material accumulated over the crisis, avoiding the second dip which appears in the Carreras-Felice series.

A third and final problem with the choices made by Carreras and Felice concerns the construction industry. For this sector, the estimates by Carreras and Felice do not differ from the old ISTAT-Fuà series. This series is obtained on the basis of three individual series, one for public works, one for non residential housing and one for residential housing. The first series is constructed on the basis of data on the total number of days worked (Vitali, 1991, p. 65). The second series is based on a general index of industrial production in manufacturing (Vitali, 1991, p. 70). The third series is obtained by using data on the number of permits certifying that a building is fit for habitation. This third series is the most fragile one. Permits of habitability were awarded with a certain delay, which was not constant over time. A publication by the *Federazione Nazionale Fascista della Proprietà Edilizia, Il Mercato Edilizio*,

states that this delay was ‘particularly acute’ (*Il Mercato Edilizio*, 1934) during the crisis. The authors of the series adopted a moving average approach, to eliminate, at least in part, possible distortions. However, this approach excessively smoothes the series and does not take into account the fact that the size of the lag appears to have changed over time.

2.4.2 The new series

These problems can be corrected for using a range of alternative indicators. In some cases, which include the cotton industry and some branches of the mechanical engineering industry, direct production data can be used to replace the proxies by Carreras and Felice. In others, when direct production data are not available, a range of alternative proxies is deemed to be more reliable. Unfortunately, the data sources employed do not always allow one to extend the series beyond 1928. For this reason, more work will be needed to incorporate the new series in the Italian national accounts and to extend the existing series to the 1911 benchmark. However, the new series allow one to re-examine what occurred during the Great Depression - which is the central objective of this Chapter.

The first one of such proxies is employment, which we correct for changes in the number of hours worked³⁹. The data used, which are described in Appendix 2.A,

³⁹The importance of correcting for changes in the number of hours worked was noticed by the statisticians who computed the index of industrial production by *Sindacato e Corporazione*, which is also, in part, based on employment data. In their index, they incorporated the cut in the number of hours worked which occurred as of 11th October 1934, which is when the forty hours working week was introduced in the secondary sector. As it is outlined in Appendix 2.B, we incorporate information on the number of hours worked from before 1935. This is because, as it is evident

come from three coeval publication, the *Bollettino di Notizie Economiche* from Assonime, the *Bollettino del Lavoro e della Previdenza Sociale* from the *Ministero delle Corporazioni* and *L'Economia Italiana nel Sessennio, 1931-1936* from the *Banca d'Italia*.

It is clear that using employment as a proxy for value added is problematic. Most obviously, this means assuming that labour productivity was constant over the period. The point is that, when available, it turns out to be a better indicator than those used by Carreras and Felice. This claim is supported by evidence coming from some branches of the mechanical engineering industry, namely the manufacturing of motor vehicles and of the rolling stock, as well as shipbuilding. For all these branches, data on the apparent consumption of metals, on employment and on actual output are available⁴⁰. This means that one can see how well the two indicators proxy output. Figure 2.4 plots the relevant series for two possible proxies, together with the relevant output series. We also calculate some simple bivariate correlations between the branch-specific output series and, respectively, the employment and the apparent consumption series, which are presented in Table 2.2.

The data plotted in Figure 2.4 and the results presented in Table 2.2 support

from data present in Zamagni (1994), the number of hours worked started to decline as early as in the late 1920s. This is confirmed by Piva and Toniolo: ‘the more than proportional decline in the number of hours worked relative to total employment began as early as 1929, probably as a result of *de facto* agreements at the factory level that suited employers and for reasons of “social peace” and “consensus” (Piva and Toniolo, 1988, p. 237).

⁴⁰To be more specific, the index of the apparent consumption of metals is an industry-wide one, while data on employment are branch-specific. For a complete description of the output data, see Appendix 2.B.

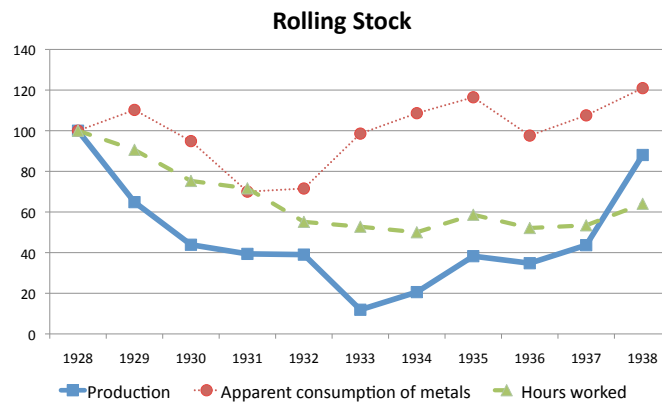
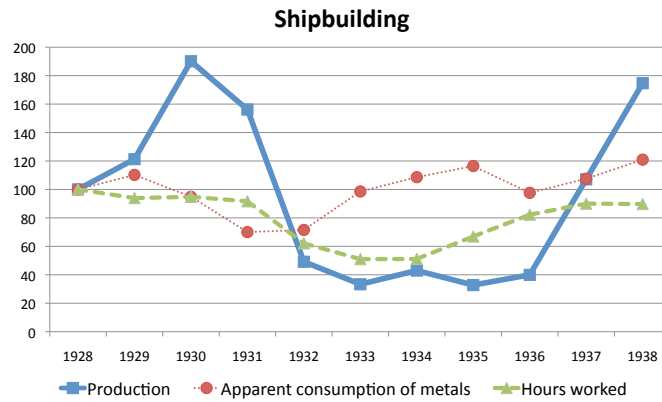
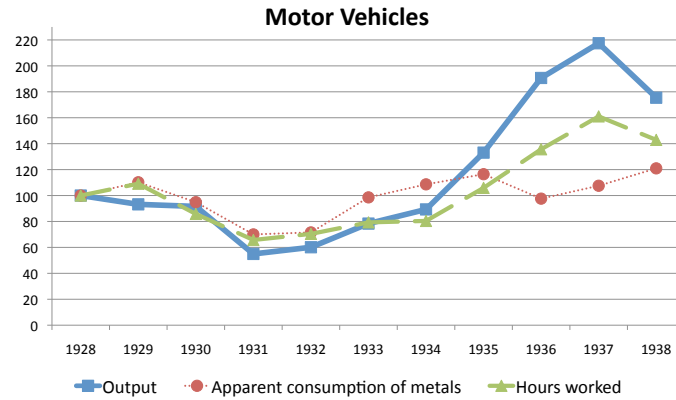


Figure 2.4: Production and possible proxies in three branches of metal engineering, 1928-1938, (1928=100)

Sources: see text

	Apparent Consumption	Hours Worked
Shipbuilding	-0.018	0.764
Rolling Stock	0.283	0.744
Motor Vehicles	0.565	0.966

Table 2.2: Correlation table: output, employment and apparent consumption of metals, 1928-1938

Sources: see text

the view that, in the period between 1928 and 1938, an indicator of employment corrected for changes in the number of hours worked is a better proxy for production than the apparent consumption of metals. The former indicator tracks production much better than the latter one, for all the three branches considered⁴¹.

A second proxy used to replace unreliable indicators from Carreras and Felice is the capacity utilisation of machinery, which is particularly useful for a range of branches of the textile industry. Output data for cotton, available from the *Istituto Cotoniero*, allow one to test how well different indicators can proxy production in the textile industry when the data on output are absent. This is the case of many branches of the textile industry, including silk weaving, wool spinning and weaving

⁴¹What is more, changes in the apparent consumption of metals add relatively little new information which can help to explain the movement in direct production. A simple regression of both proxies on the relevant output series shows that, differently from the employment series, the apparent consumption is always statistically insignificant at the 10% level. Furthermore, the R^2 of a regression comprising both variables is not substantially different from the one of a model which only includes the employment series. Full results are presented in Appendix 4.4.

and jute, linen and hemp spinning and weaving. Having discarded the apparent consumption of raw material as a possible proxy for production, there remain two possible alternative indices. The first one is the capacity utilisation of machinery, a proxy which was also employed by the *Sindacato e Corporazione* index. The second one is an employment index, as expressed by the number of hours worked⁴². It is sufficient to inspect Figure 2.5 to understand that the capacity utilisation of machinery is a much better proxy for value added than employment. The correlation coefficient between output and capacity utilisation is 0.90 for spinning and 0.83 for weaving, while the one between output and the number of hours worked is 0.50 for weaving and 0.78 for spinning⁴³. Hence, for the textile industry, I proceed to proxy value added using data on capacity utilisation.

A third change in the series concerns the construction industry. All the three indices forming the Carreras and Felice series are rebuilt, although only one major correction is made. This concerns the series for private housing, where I employ construction permits instead of permits of habitability. The main reason to employ the former instead of the latter has to do with the different length of the lag between the release of each one of these two permits and actual construction, with the lag of

⁴²The indicators for capacity utilisation relative to spinning and weaving refer, respectively, to the capacity utilisation of spindles, measured as the total number of spindle-hours, and that of frames, measured as the total number of frame-hours. In both cases, data are taken from ASI. As for the number of hours worked, unfortunately, it is impossible to distinguish between spinning and weaving. Hence, in both cases I use the same series, which refers to the cotton industry as a whole. Further details on how the series are built are provided in Appendix 2.B.

⁴³The fact that output is better correlated with an indicator relative to capital than with one relative to labour may be explained with the progressive substitution of capital for labour which occurred in the cotton industry throughout the crisis. See Toniolo (1980, p.169).

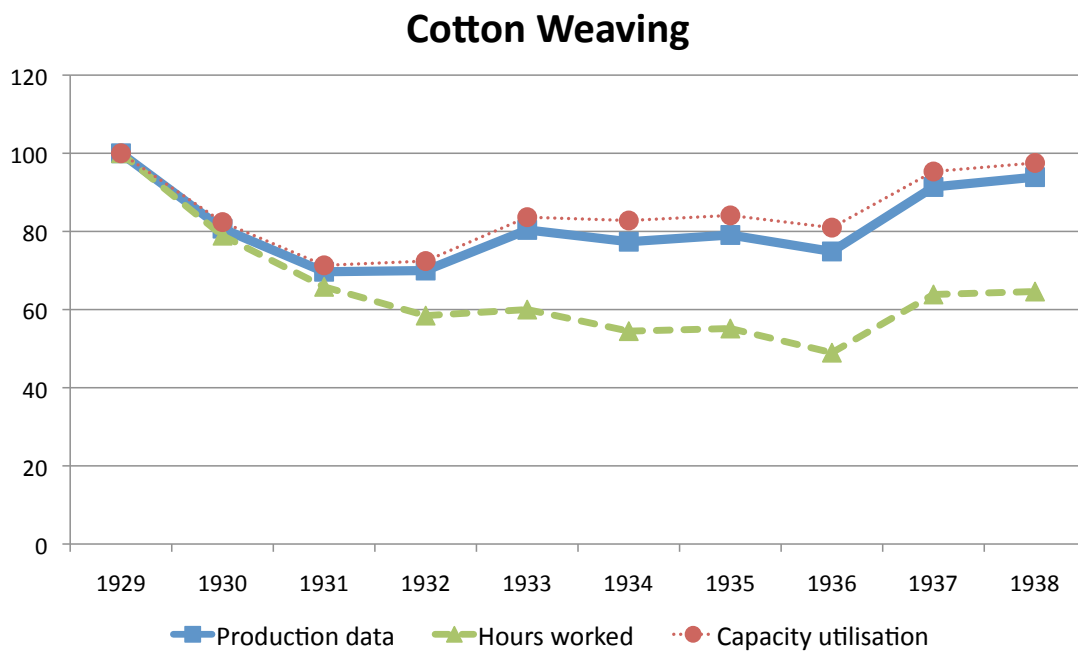
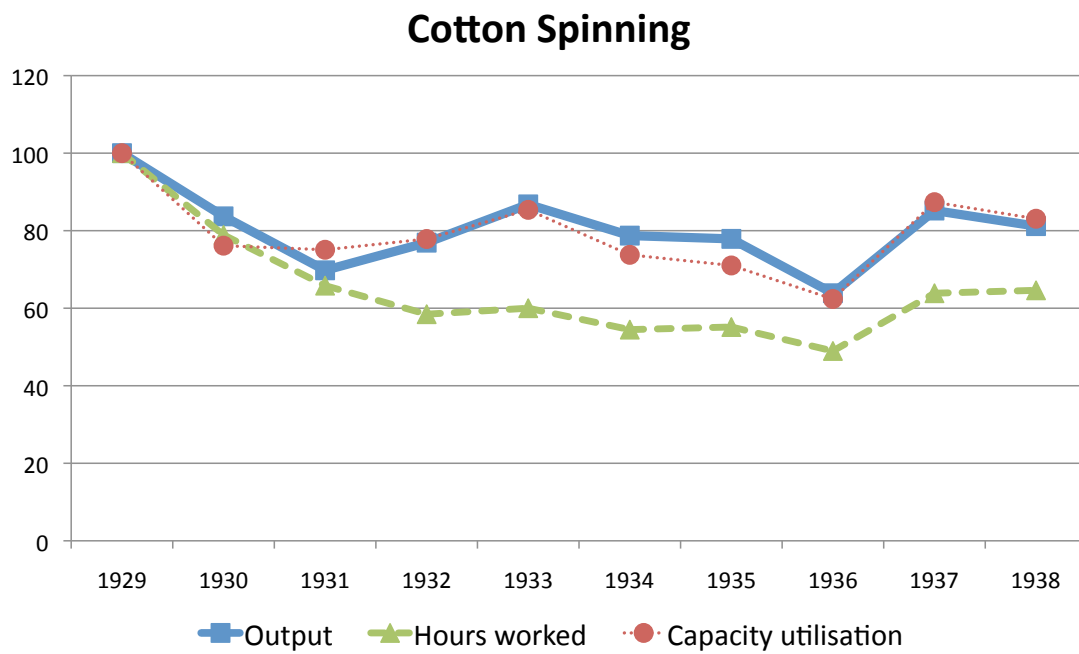


Figure 2.5: Production and possible proxies for cotton spinning and weaving, 1928-1938, (1928=100)

Sources: see text

the permits of habitability being much larger. This is confirmed by coeval publications⁴⁴, which preferred to use this particular indicator whenever they were analysing the short-term movements of the market, while relying on permits of habitability to observe its long-run development⁴⁵.

2.5 Alternative estimates of value added for selected sectors

This Section presents revised series for five branches of Italian industry between 1928 and 1938, comparing them with those produced by Carreras and Felice. The results are grouped in three Sections, depending on the methodology employed by Carreras and Felice. Section 2.5.1 analyses the textile and engineering industries, which Carreras and Felice describe using data on apparent consumption of raw materials. Section 2.5.2 looks at the timber and furniture and at the clothing and leather industries, whose series were based on consumption data. Lastly, Section 2.5.3 analyses the construction industry.

⁴⁴See, among others, *Il Mercato Edilizio* (1934, p. 33).

⁴⁵A small change is also applied to the series for public works, where I correct the employment data for changes in the number of hours worked. Conversely, the index of industrial production in manufacturing is retained as my series which is relevant for non-residential buildings for reasons which are better explained in Appendix 2.B. Obviously, although the same methodology is employed, the old series relative to the manufacturing sector is replaced by the new one.

2.5.1 Textiles and mechanical engineering

The two main revisions of this paper concern the textile and mechanical engineering industries. According to the estimates produced by Fenoaltea and Bardini (2000a), total value added for the former branch in 1938 was 9,377 million lire, just below a fifth of the total industrial value added. As for the latter branch, value added accounted for slightly more than four billion lire, that is just below a tenth of total industrial value added in 1938. In the Carreras-Felice series, both industries were proxied using data on the apparent consumption of raw materials.

Figure 2.6 presents the final series for the value added of the mechanical engineering industry. As explained at length in Appendix 2.B, this series is constructed partly on the basis of direct production data, and partly on the basis of employment data, corrected for changes in the number of hours of work. Figure 2.6 compares the new series to the corresponding one by Carreras and Felice (2010). My index indicates that, between 1929 and 1932, value added fell by around 40%, with the contraction lasting well beyond 1931. In fact, differently from the series by Carreras and Felice, the new series shows that the recovery started in a sustained way only around 1934 and that it continued until 1938. No double dip is, therefore, present in 1936.

The plausibility of this series is corroborated by historical evidence relative to some of its branches. According to the Assonime bulletin, mechanical engineering was one of the branches of the Italian economy which saw a deepening of the crisis in

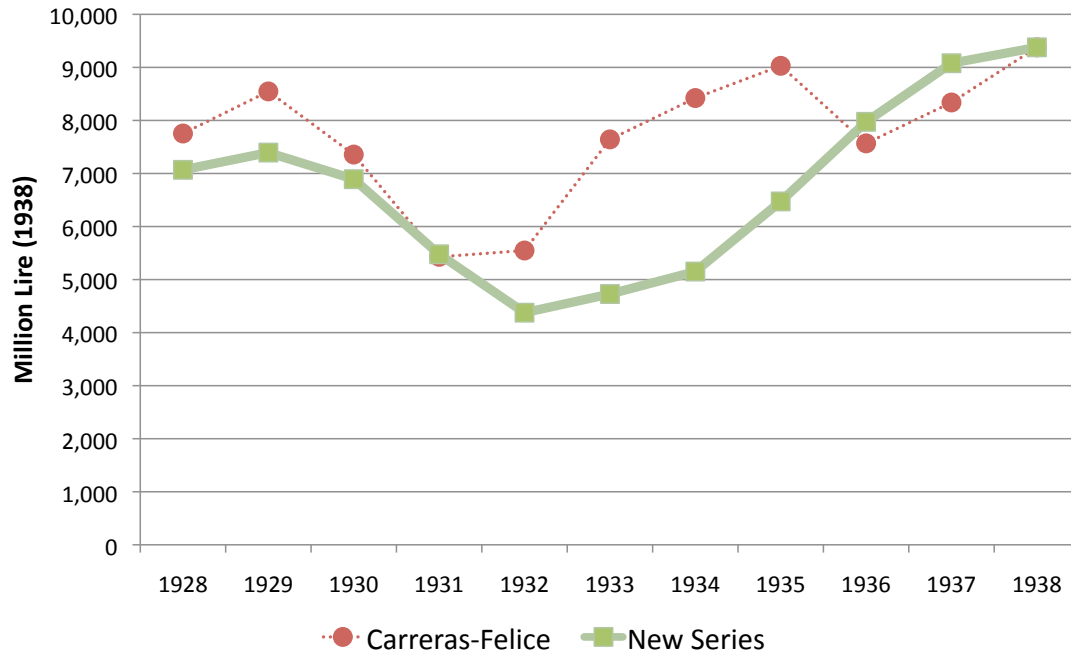


Figure 2.6: Value added of the mechanical engineering industry, 1928-1938

Sources: Carreras and Felice (2010) and Appendix 2.B.

1932 (Assonime, 1933, p. 2). The performance of the shipbuilding industry was particularly weak. *L'Indipendenza Economica Italiana* is a 1937 publication analysing the developments made by the different branches of the Italian economy in order to suit the autarkic plans of the regime. Despite the overall propagandistic tone of the volume, it is interesting to see how Cesare Sacerdoti, the then C.E.O. of the *Cantieri Riuniti dell'Adriatico*, complained about the economic troubles of his branch. In particular, the fall in demand due to the crisis was aggravated by the high import duties imposed by the government, which he suggests to have heavily penalised the sector by increasing construction costs. Furthermore, the economic woes of the sector had also been aggravated by the decision by the British government to leave the

gold standard, which had greatly helped one of Italy's main competitors. Sacerdoti explains how 'between 1931 and 1936 no cargo boat was commissioned by Italian shipowners to Italian shipyards' (Sacerdoti, 1937, p. 360). The conditions of the motor vehicles industry were, conversely, less dramatic. The industry was helped by an increase in the import duty on cars (Toniolo, 1980, p. 172), which allowed it to suffer from a relatively light depression. Its recovery was also very quick, as it started in 1933, so that, in 1934, production was just below its 1929 levels. Growth continued from 1934 onwards and was mainly driven by the production of commercial vehicles, which increased from just below 9,500 in 1935 to almost 17,000 in 1936⁴⁶.

Figure 2.7 shows the old and new second-generation series for value added in the cotton industry between 1928 and 1938. In this case, the main difference between the new series and the one presented in Carreras and Felice does not relate to the length of the depression. Both sets of series, in fact, suggest that the recovery started in 1932 and accelerated in 1933. However, major differences concern the depth of the depression and the post-1933 era. According to the old series, the fall between 1929 and 1932 was in the region of 15% for spinning and 20% for weaving. My new series suggest that the fall was around eight percentage points higher, that is around 23%

⁴⁶The speed of the recovery in this particular branch of the engineering industry may be slightly overestimated as data do not allow to control for possible changes in the size of cars. This is a problem as the 1930s were characterised by a downsizing of cars produced. In *L'Indipendenza Economica Italiana*, Giuseppe Acutis, President of the Association of Car Manufacturers (*Associazione Nazionale Fascista fra Industriali di Automobili*), explained how 'since 1933, car production is essentially directed towards economy cars' (Acutis, 1937, p. 337). This view is confirmed by figures presented in a table in Banca d'Italia (1938) regarding cars circulation, which shows how the proportion of small cars (i.e. those with an engine of less than 16 HP) rose from 59% in 1930 to 70% in 1936. Since one can expect smaller cars to have a lower value added per car than larger cars, I may be slightly overestimating the speed of the recovery in this particular branch.

for spinning and 27% for weaving. Although it is true that the sector suffered from a second difficult phase in the years between 1934 and 1936⁴⁷, this was by no means comparable to the Great Depression as the figures by Carreras and Felice suggest, and probably characterised 1934 and 1936 more than 1935. The fall in apparent consumption seen in 1935 is due to the extensive employment in production of stocks of raw cotton.

Figure 2.7 also presents the old and the new series for value added of the silk industry between 1928 and 1938. It also shows an alternative index which is based on the quantity of reeled silk only. For Carreras and Felice, the crisis of the industry between 1928 and 1938 is far more dramatic than is shown by my data. The series by the two scholars emphasises three main episodes of crisis for the industry (one between 1930 and 1931, one between 1934 and 1935 and one between 1937 and 1938). In each one of these three years, their index loses around 35%. A consequence of this asymmetry is that there is a large difference between my own and their estimate of value added in 1928, as mine is around two-fifths of theirs. A further inconsistency between the two series concerns the timing of the crisis. For Carreras and Felice, much of the downturn occurred in one year, namely 1931, when production fell by over 30%. According to the two scholars, the crisis was deep but also rather quick, since the year 1932 was already marked by a slow recovery. My estimates, conversely, present a very different profile. A trough was not reached until 1932 and much of the contraction occurred in 1932, when around 30% of production was lost. Figure

⁴⁷For more details, see Banca d'Italia (1938, p. 740).

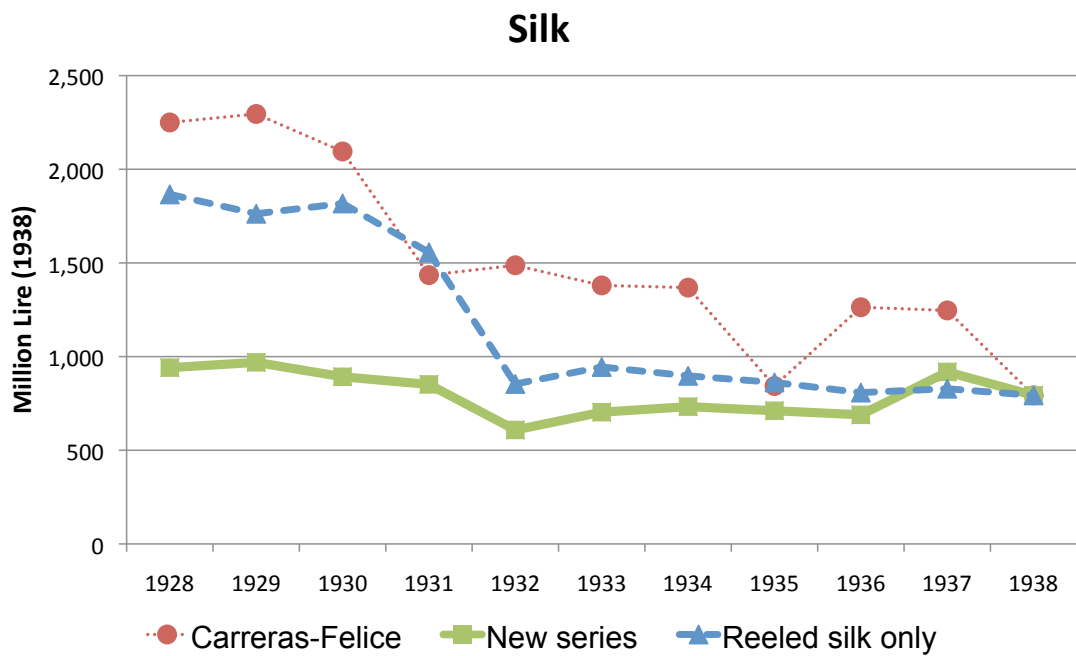
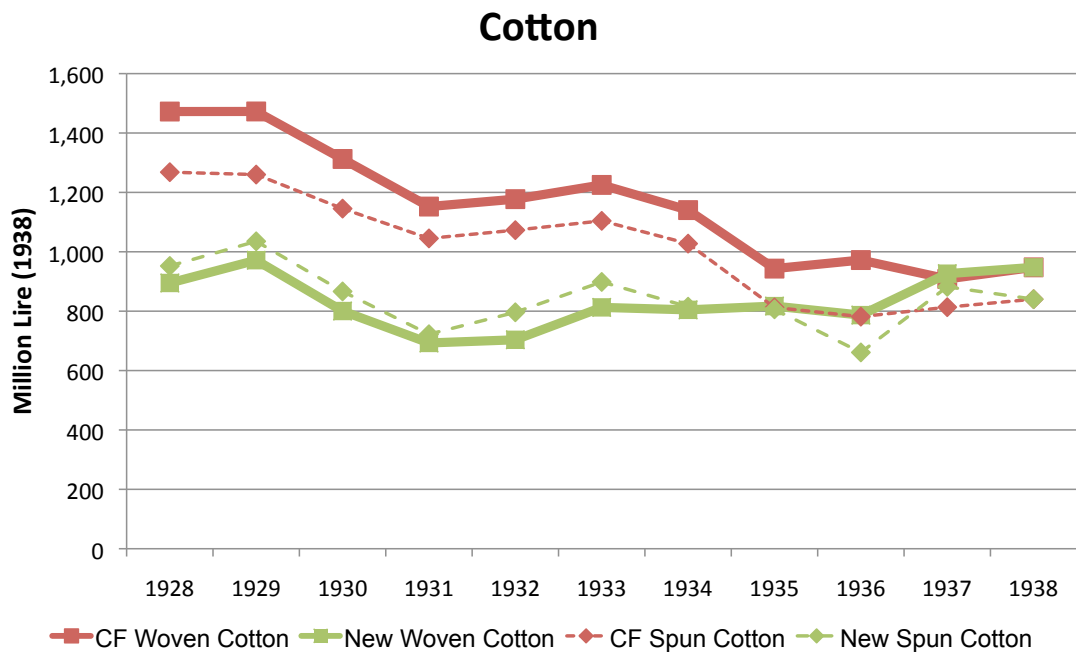


Figure 2.7: Value added of the cotton spinning and weaving industry and of the silk industry, 1928-1938

Sources: Carreras and Felice (2010) and Appendix 2.B

2.7 depicts data on the production of reeled silk coming from the *Ispettorato Corporativo*, which are more reliable than those from the *Ente Serico* as they describe the actual production of reeled silk rather than the potential one. The diagram clearly shows a dramatic fall in production between 1930 and the end of 1932. The discrepancy for 1932 is particularly evident and offers support to the view that the crisis for the sector was more prolonged than it was assumed by Carreras and Felice. The timing of the crisis is, in fact, confirmed by the coeval historical evidence. From Banca d'Italia (1938), we can learn that the silk reeling industry had two bad years in both 1931 and 1932. The crisis of the sector was far from over even in 1933, when, on 10th March, the Undersecretary to the *Corporazioni*, in a speech to Parliament stated that the government was 'intensely' working to help producers to sell a large stock of unsold silk (Inf. Corp., March 1933).

The old and new second-generation series for the wool, jute, linen and hemp industries are presented in Figure 2.8. In all cases, we rely on capacity utilisation as a proxy for production. The new series present trends which are much more reasonable and in line with the historical evidence of the period. The Great Depression for the wool industry was characterised by a decrease for both the spinning and weaving industry in the region of 15%. Both branches experienced a recovery in 1933, but the magnitude of the contraction is much smaller than suggested in previous work. The bust for 1936 hypothesised by Carreras and Felice disappears almost altogether, leaving a small dip for 1936, which equals 13% for weaving and 11% for spinning⁴⁸.

⁴⁸Such a picture is confirmed by the limited data on direct production referring to the period between 1934 and 1938. According to these data, physical production of woven and spun wool fell,

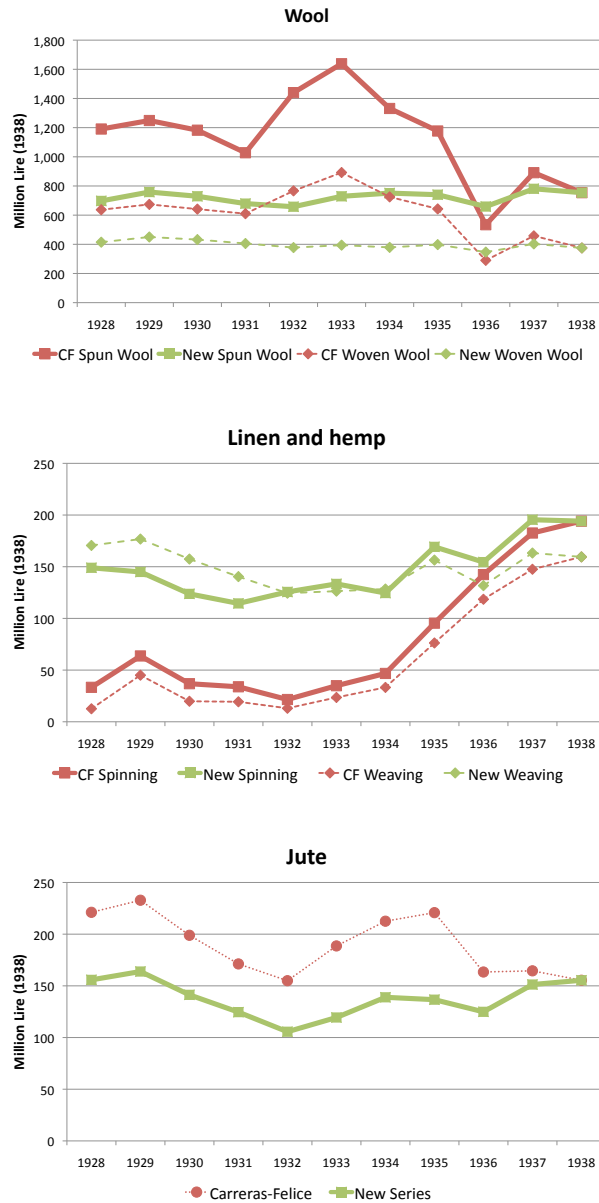


Figure 2.8: Value added of wool, linen, hemp and jute spinning and weaving, 1928-1938

Sources: Carreras and Felice (2010) and Appendix 2.B

The trends of the jute, hemp and linen industries also appear much more reasonable, with the last two products still experiencing a rise during the period of autarky, but a much less pronounced one than that outlined in previous work. The trend of the jute industry appears way more in line with that of the wool and cotton industry, with a decline between 1929 and 1932, followed by growth until 1934 and by a gentle decline until 1936. In all cases, the cycles appear much less volatile.

2.5.2 Timber, furniture, clothing and leather

The next adjustment concerns the timber and furniture and the clothing and leather industries. The old and new profiles of the two series are depicted in Figure 2.9. In the new series for timber and furniture, the industry suffers from a contraction of less than 25%, lasting between 1929 and 1933. The recovery starts in 1934 and continues until 1938, when value added reaches a level which is slightly higher than the pre-depression peak. The new series shows that the large fall in value added occurring in 1936 described by the Carreras and Felice index was largely spurious.

Figure 2.9 also presents new estimates for the clothing and leather industries. Differently from the Carreras and Felice series, which is based on a unique aggregate figure, the new series presented in the Figure is the sum of four separate indices, one for clothing, one for shoemaking, one for the leather industry and one for the production of various textiles. All these series are based on largely branch-specific data on the total number of hours worked⁴⁹. The new series is characterised by a

respectively, by 14% and 8% between 1936 and 1935.

⁴⁹A full description of the data sources is provided in Appendix 2.A.

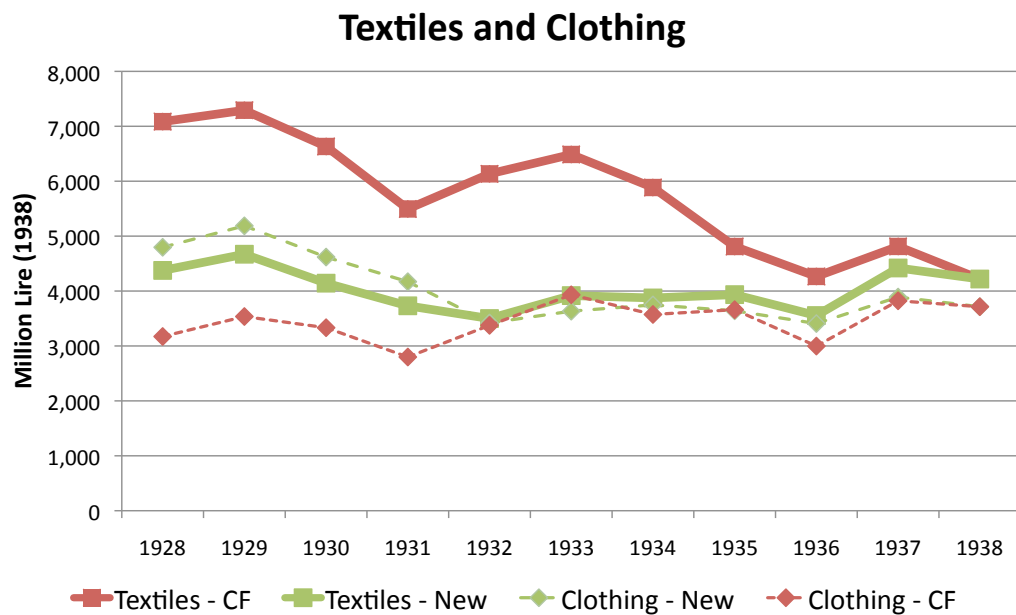
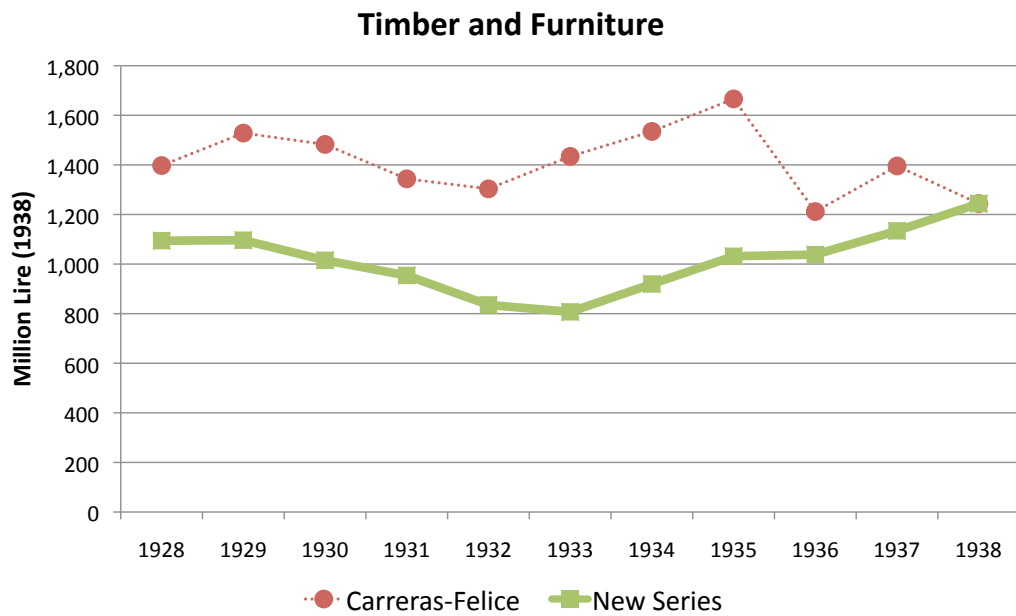


Figure 2.9: Value added of the timber and furniture and of the clothing and textile industries, 1928-1938

Sources: Carreras and Felice (2010) and Appendix 2.B

cyclical behaviour which is different from that of the Carreras-Felice series. The crisis appears deep and prolonged, lasting until 1932. The year 1932, in particular, is one in which the sector experiences a further downturn, rather than enjoying a jump of around 20%, as it appears in the old series. As for the period after 1932, the new series is rather similar to the old one, showing how the sector never returned to the pre-crisis levels. The plausibility of this trend is confirmed by a comparison of this series with the one of the textile industry, which is also shown in Figure 2.9. The Carreras and Felice series for the two sectors, which are naturally linked, have a zero correlation coefficient. Furthermore, although the value added of the two sectors appears to be very similar in 1938, value added of the textile industry in 1928 is more than twice as high as that of the clothing and leather industry. This appears far too much, even allowing for the fact that textiles have traditionally been an export-oriented sector and that, therefore, not all of the domestic production was employed to produce clothes. Conversely, the new series can more easily be reconciled with each other. The correlation coefficient between them is in the region of 0.7 and the distance between the two lines is always very small. This is precisely what one would expect between two industries with such strong backward and forward linkages.

2.5.3 Construction

The last revision this paper puts forward with respect to old series concerns construction. The estimates by Fenoaltea and Bardini for 1938 indicate that the value added of this industrial branch in 1938 was equal to 4.972 billion lire (1938 prices), more than a tenth of the total value added of Italian industry in 1938. The series

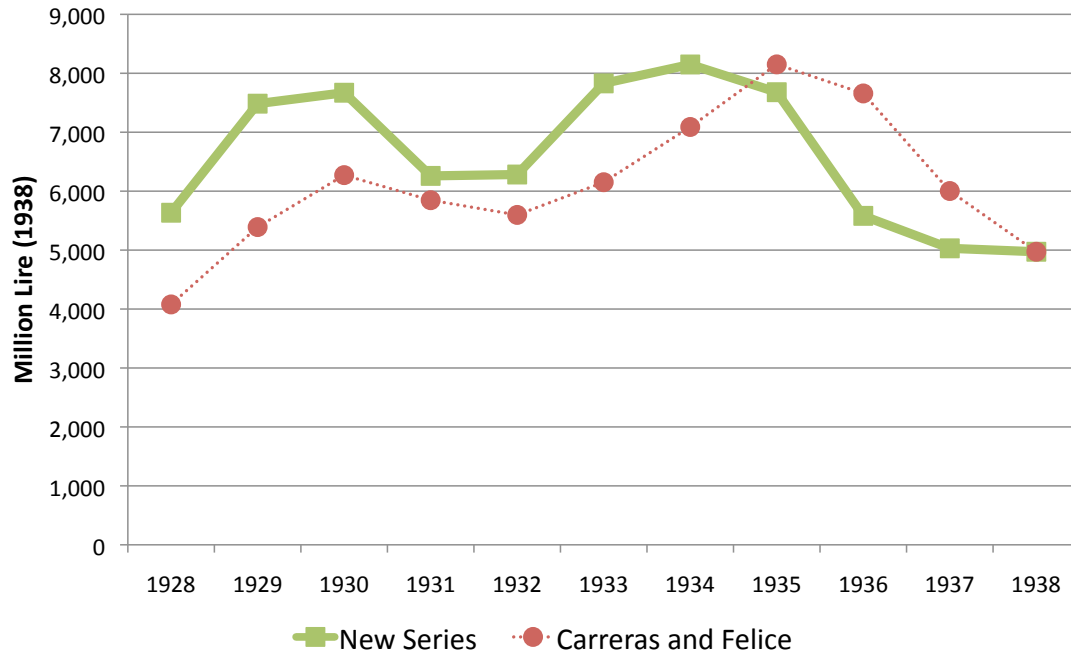


Figure 2.10: Value added of the Italian construction industry, 1928-1938

Source: Carreras and Felice (2010)

shows a 1929 cycle which is much less smooth than the one in Carreras and Felice⁵⁰. The new series appears to be more consistent with the historical evidence. Between 1929 and 1930, the index is shown to be rising gently, a variation which is due to the different behaviour of public and private construction. The index relative to public construction rose as the industry was helped by the funds funneled by the government before the crisis had started. In particular, the Mussolini Law⁵¹ gave a first important impulse to the drainage of the Italian marshes. Together with the

⁵⁰Conversely, its variability is less dramatic than the one shown by the *Sindacato e Corporazione* index. This is because the new index attributes a much larger weight to the counter-cyclical public works operated by the regime.

⁵¹R.D.L. 24th december 1928, n. 3134.

intensification of roadworks, this helped the performance of the industry. The boost coming from public works was, however, partly countered by the weak performance of private construction. The number of rooms authorised in all the provincial capitals (*capoluoghi*), fell from almost 240,000 to 205,000 (ASI, 1936). This led the commentators of Assonime to state in their commentary for the April 1930 issue of the *Bollettino* that, in the construction industry, ‘with the beginning of the spring, one can notice the normal symptoms of a seasonal recovery. Such a recovery, however, has not been particularly noticeable. It is hard to think that this sector will be characterised by a period of sustained activity: in fact, various symptoms lead one to believe that, having reached in 1929 the peak of its parabola, this industry is now heading for a period of depression’ (Assonime, April 1930, p. 440-1). Such a description fits much better with the evidence presented in the new index than with the one presented in the series employed by Carreras and Felice.

As for the later development of the crisis, the new index shows that the sector was particularly weak in 1931 and 1932. The imperceptible rise in 1930 was followed by a fall between 1930 and 1932 which was larger than the one depicted in the old series. Such a fall is also confirmed by coeval evidence. In the April 1932 issue of Assonime, it is stated that ‘there has been a *further* worsening of the conditions of the construction industry. Its crisis, which had started with some delay compared to other industries, is now showing a progressive intensification. In a recent speech at the *Camera dei Deputati* the *Ministro delle Corporazioni* remarked that the construction industry is the sector experiencing the deepest economic depression’

(Assonime, 1932, p. 468).

The new series also captures more adequately the long-run implications of the crisis. The funds allocated by the government to public works started falling, in real terms, as of 1933, which is reflected in the contraction of our indicator. The recovery in residential and non-residential construction initially helped the industry to overcome this contraction. In particular, residential construction kept growing in anticipation of the termination of a favorable fiscal regime, which was due to end in 1936⁵². However, the year 1936 was marked by a severe collapse, which was jointly determined by the contraction in public works, a slowdown in the construction of non-residential buildings and a marked downturn in that of residential housing. This last contraction was particularly significant because of two main factors. Firstly, although the government attempted to extend fiscal exemptions on new residential construction, it was ‘evident that, following the boom of the previous years and the saturation of the market, such extensions would only have a limited impact on the demand for new permits’ (*Il Mercato Edilizio*, 1937, p. V). Secondly, towards the end of 1935 the regime passed a very severe piece of legislation which ceased the award of new permits for the construction of private houses, so as to limit the consumption of imported raw materials⁵³. The plan was revoked on 16th July 1936, though only relatively to construction whose value was less than 250,000 lire. The combination of these factors had substantial effects for both the construction industry and, as it

⁵²see *Il Mercato Edilizio*, 1935, pp. V-VI.

⁵³One may worry here about the possible emergence of a black market. However, even if there was one, it would have been limited by the generalised shortage of raw materials (see *Il Mercato Edilizio*, 1937, p. V).

will be explained in the next Section, for the industrial sector as a whole.

2.6 A new series for the industrial sector

Figure 2.11 shows the Carreras-Felice series, a series obtained by superimposing the Fuà series on the new benchmarks constructed by Bardini and Fenoaltea, together with the new series of value added for the period between 1928 and 1938. This last series is obtained by combining the new series presented in Section 2.5 with the remaining series from the work by Carreras and Felice⁵⁴. The estimates for 1938 of the three series are identical by construction. What appears more interesting is that, at least at an aggregate level, the new and old estimates for 1928 appear very similar.

The new series sheds some new light on the profile of the crisis in Italy. From the evidence I have collected, it appears that it was deeper and longer than previously estimated. The trough of the cycle is located in 1932 and not in 1931 as suggested by Carreras and Felice, as 1932 was a year characterised by a further fall of industrial output rather than by the beginning of the recovery or by a stabilisation. The depth of the depression is also different. According to Carreras and Felice, between 1929 and 1932, industrial value added fell by 13%, and by 15.3% if one excludes construction. This was roughly similar to the results obtained by the Fuà group, who had found a fall which was in the region of 13% in both cases. The new series suggests

⁵⁴The remaining series appear less controversial as they are based on estimates of direct production or on the consumption of perishable goods, which appears to be a reasonable proxy for production. An exception is the series for the photography and cinema industry, where the authors use data relative to the consumption of entertainment. However, the limited size of the sector and the absence of a better proxy made us keep the original series.

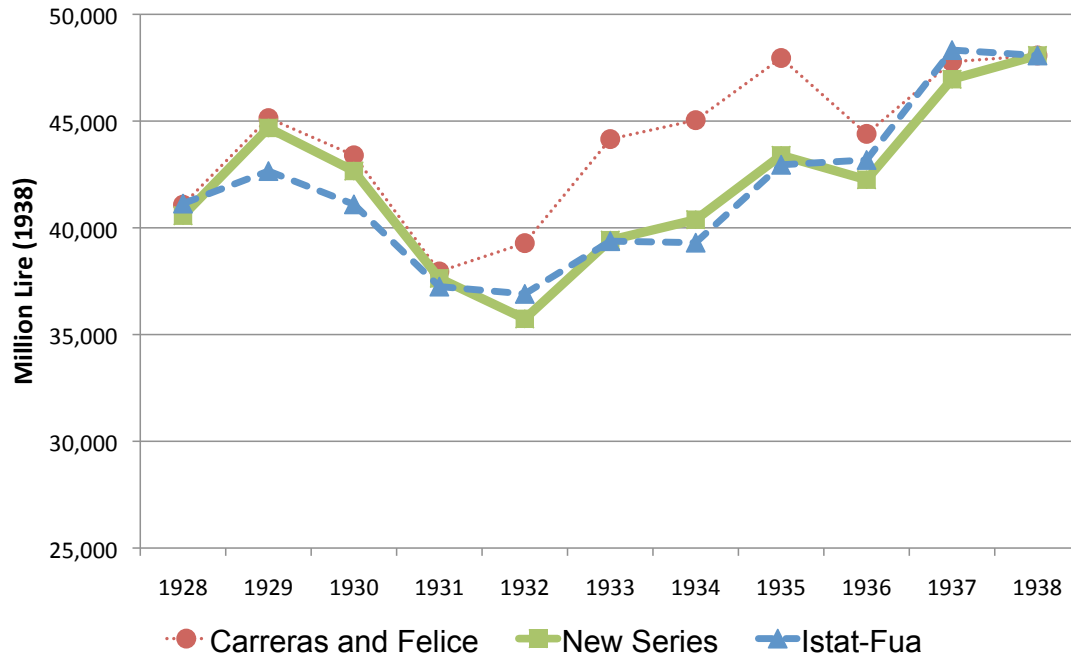


Figure 2.11: Value added of Italian industry, 1928-1938

Sources: Carreras and Felice (2010), Fuà (1978) and Appendix 2.B

that industrial value added fell by around 20%, 21% if we exclude the construction sector. Although this contraction is way less significant than the one presented in the index of the *Ministero delle Corporazioni* and emphasised by Mattesini and Quintieri (1997) and by Giordano, Piga and Trovato (2011), the new results brings the Italian experience more in line with the one of France, where, according to the data reported by Carreras and Felice, value added, excluding the construction sector, fell by 25.6%.

A substantial difference also concerns the recovery. While in the Carreras and Felice series the recovery was almost complete by 1933, the new series suggest that a level comparable to the pre-depression peak was not reached until 1935-6. This

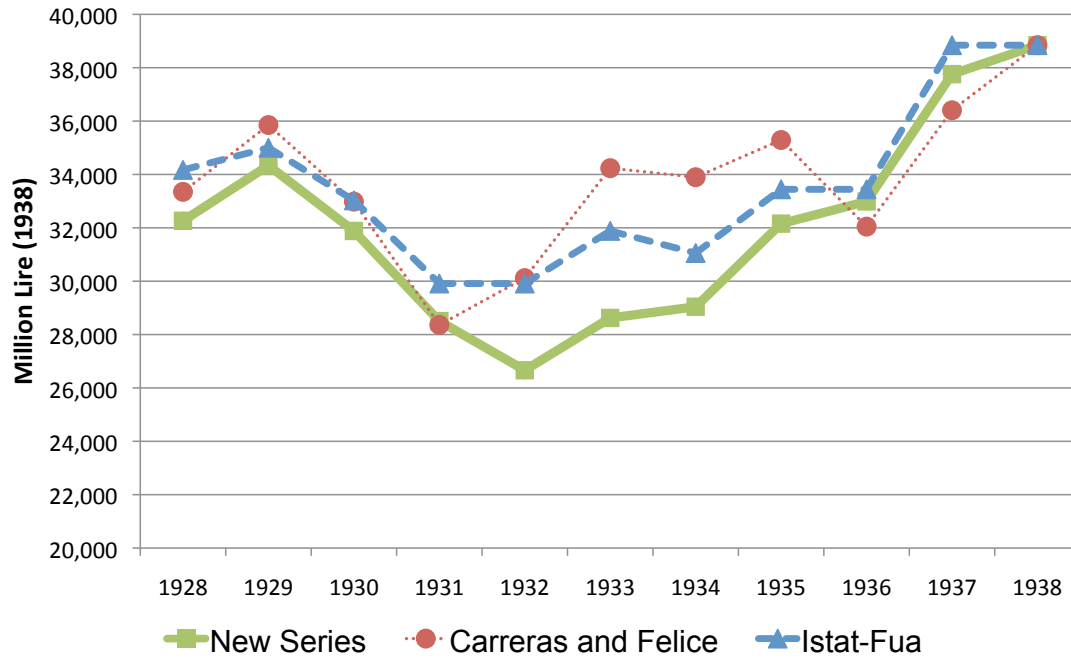


Figure 2.12: Value added of Italian manufacturing, 1928-1938
Sources: Carreras and Felice (2010), Fuà (1978) and Appendix 2.B

supports the view of a more persistent depression, although it somewhat challenges the even bleaker view portrayed by scholars working with the index of the *Ministero delle Corporazioni* (Mattesini and Quintieri, 1997; Giordano, Piga and Trovato, 2011).

The new series can also help us in understanding whether some of the counter-cyclical policies enacted by the regime were or not successful in helping the Italian economy out of the depression. Differently from the ISTAT-Fuà series, which only showed a slowdown of industrial activity in 1936, my new series confirms the hypothesis of a double-dip recession, as put forward by Carreras and Felice. However,

it is interesting to plot a series which only shows what occurred to the manufacturing sector, as it is done in Figure 2.12, to see that the reasons for this dip are, indeed, different. In Carreras and Felice, the new contraction is caused by a fall in production in the manufacturing sector. This fall is almost entirely spurious, as it depends on using the apparent consumption of raw materials as a proxy for production. The presence of a second dip in the new series is, conversely, largely linked to what happened within the construction industry, where production fell dramatically in that year. This downturn was due to legislative changes affecting market for private construction and to the progressive termination of the public works program which had helped the economy during the difficult times of the crisis. Growth would only resume in 1937, largely thanks to the preparation for the war⁵⁵.

2.7 Conclusions

This essay confirms that the doubts of the pessimist field with regard to the Great Depression were, indeed, well-placed. The new series presented here relies on the second-generation figures produced by Carreras and Felice, but revises their estimates for sectors whose value added was roughly 50% of the total in 1938. In doing so, it avoids relying on the apparent consumption of raw material and on consumption data, two indicators which are inappropriate for the period or based on unreliable information. The series for the construction sector is also rebuilt, using information

⁵⁵‘In 1934 military expenditure still only amounted to about two thirds of the monies disbursed on public works, education and other social arenas. In 1936 preparation for war took more than all domestic spending, in 1940 three times more’ (Bosworth, 2005, p. 273).

on construction permits instead of data on the permits of habitability.

Our main result is that, as argued by the pessimist field, Italy was not such an anomaly in Europe. Although the size of the contraction was not as large as in countries such as Germany, the Depression was deeper and longer than depicted in the literature and roughly comparable to what occurred in France. This description goes a long way in explaining the need for the government to pass emergency legislation in 1932 and helps to solve the puzzle regarding the discrepancy between the trends of the data on unemployment as described by Piva and Toniolo (1988) and what we knew from the national accounts.

The new series also emphasises the role played by the construction sector during the crisis. Public works helped the economy during the early 1930s, though they were not sufficient to render the crisis a quick and light one. Furthermore, when the funds for public works were cut, the combination of the contraction in this sector and of a slowdown in manufacturing caused a second dip. This dip could only be overcome thanks to the run-up to the war, which allowed the economy to finally get back to pre-depression levels.

2.A The employment data

This paper employs a range of series relative to employment or to the total number of hours worked in a given industrial branch. In some cases, the data are directly taken from *Sindacato e Corporazione*. In others, the series are constructed on the basis of two publications. Data from a publication from the Bank of Italy, *L'economia italiana nel sessennio 1931-1936*, are used to cover the years between 1931 and 1936, while data from various issues of the *Bollettino di notizie economiche* published by Assonime are used to complete the series for the years 1928-1930 and 1937-8.

The first source used is a one-off publication by the Bank of Italy. The employment data relevant for this study are published in a table in the first volume of the publication (Banca d'Italia, 1938, pp. 98-99). This table presents data on the number of employees, as well as on the total number of hours worked, for the period 1931-1936. Its sectoral coverage includes 40 branches of manufacturing, the construction industry, the utilities and mining. Unfortunately, the table is not properly sourced, so it is difficult to track back the exact origin of the data and to assess the extent of its coverage. However, two observations suggest that the data come from Confindustria and that they cover the whole of the industrial sector, with the exception of craftsmen. Firstly, in the text of the chapter containing the forementioned table, it is stated that 'for the industrial sector, one has a total number of employees equal to 6.1 million, of which around 1.8 million are craftsmen' (Banca d'Italia, 1938, p.85). Since the the total number of employees in the table in 1936 is 4.35 million, it is clear that the table is referring to the population of (non-craftsman) industrial

workers present in Italy at the time. Secondly, a document found in the historical archives of the Bank of Italy, coming from Confindustria and dated 31st December 1935, reports the number of firms represented in each sector of the *Confederazione* and the total number of employees for each sector. The relevant figures are very similar to those presented in the Banca d'Italia table and relative to 1935⁵⁶. On the basis of these two elements, one can safely assume that the table used here covers the total number of employees (non-craftsment) for each sector, rather than only covering a sample of them. Since the coverage of the other available source is more limited, in the construction of these series we employ the Banca d'Italia data for the period between 1931 and 1936 and then chain them to data coming to the other source to cover the remaining years.

The second source is the *Bollettino di Notizie Economiche* from Assonime. This source includes the results of the statistical survey run by Confindustria, in agreement with ISTAT and the *Ispettorato dell'Industria e del Lavoro*. The data on employment present in the source were already used, among others, by Zamagni (1994) and by Mattesini and Quintieri (2006). They relate to a proportion of firms ranging between 16 and 24% of the total number belonging to Confindustria at the time. The number of employees covered by the sample (1.1-1.4 million) is equal to over half of the total, suggesting that the sample is biased towards large firms. The source offers monthly data on a number of variables, namely the average number of workers employed, the total number of hours worked, the total wage bill, the hourly wage rate and the

⁵⁶The differences are probably due to the fact that the table used here is based on the average number of employees per year, while the document refers to the end of the year.

number of hours worked on average by each worker. It also includes trimestral data on the number of workers registered by the surveyed firms at employment offices to make them eligible for ‘union’ benefits and reports the same number as a percentage of the total number of workers registered in each sector. The dataset covers the time-span between 1928 and 1939, but the exact sectoral coverage changes at the end of 1931. Up to December 1931, eleven major branches are included. After this date, the new classification comprises thirty-eight industries, including utilities, construction and mining, as well as many branches of manufacturing. The main problem of the dataset, as outlined both in Zamagni (1994) and in Mattesini and Quintieri (2006), is that the sample does not remain constant overtime, due to the phenomenon of entry and exit of firms. Mattesini and Quintieri (2006) argue that, because of the size of the sample, this problem does not appear to be very severe. However, they also make some adjustments in the dataset. They exploit the data on registered workers and obtain monthly data on total employment at the sector level by applying the workers’ utilisation rate to the data on registered workers. In the construction of the new series, the same strategy is employed in order to obtain the total number of employees for a given sector. In order to obtain the total number of hours worked, the hereby obtained number of employees is multiplied times the average number of hours worked. The data are then chained to those coming from Banca d’Italia (1938), allowing to cover the whole period 1928-1938.

2.B The individual series

Mechanical Engineering: Eleven elementary series are used, based on two different types of indicators. Seven indices, which correspond to shipbuilding, motor vehicles and rolling stock, are based on direct production data. The remaining four indices, covering second foundries, electrical equipment, specialised workshops and various workshops are based on indices of employment corrected for changes in the number of hours worked. The weights of the elementary series are largely based on information on the value of production in 1938, taken from the 1937-9 IC. The only exception concerns “various workshops” and “specialised workshops”, which one cannot separate out on the basis of the information on the value of production provided in the 1937-9 IC. Hence, their weights within the engineering industry are calculated by portioning the unassigned quota of the total value of production using data on total employment in the two branches in 1936, present in Banca d’Italia (1938) and extrapolated using the employment indices obtained described in Appendix 2.A. The first seven elementary series, covering the production of cars and commercial vehicles, the shipbuilding industry and the production of rolling stock are based on direct production data. For shipbuilding, which accounted for 9% of the total value of production in 1938, an index covering data on the gross tonnage of ‘launched’ merchant ships from ISTAT (1957a) is used. For the pre-World War One period, this series has been criticised by Ciccarelli and Fenoaltea (2008), who preferred to construct an own-index covering the period 1861-1913. However, the sources underlying the ISTAT series appear elusive and hard to recompose. The data come, in fact, from the *Ministero della Marina Mercantile*, but the last official publication from the *Minis-*

tero is dated 1930 and does not contain the data for the whole period covered by the present study. Since the data on launched ships relative to a given year may include ships which were actually built in the previous year, the gross tonnage of ships built in the year t is calculated as the average of the gross tonnage of ships launched in the years t and $t + 1$. This is in the same spirit as Fenoaltea and Ciccarelli (2008). Although the shipbuilding series appears very volatile, its weight in the overall index is small, limiting the extent to which it can drive the overall profile of the sector. For the motor vehicles industry, I employ two series, one relative to the number of cars and another one relative to the number of commercial vehicles produced by domestic manufacturers (ANFIA, 1984). Ideally, I would like to have some indication of the size of the vehicles produced, but this information is only present from 1934 onwards. The combined weight of these two series is 18%. Conversely, their individual weights are, respectively, 43% for cars and 57% for commercial vehicles. These weights are based on the value of production of bodyworks and frames of cars and commercial vehicles in 1938, taken from the 1937-9 IC. The last four series constructed from direct production data are those relative to the rolling stock. Four elementary series are employed, one for motor coaches, one for coaches and trailers, one for freight and baggage cars and one for locomotives. Their combined weight in the overall series for the mechanical engineering industry is 4%, while their relative weights are equal to 28%, 11%, 27% and 35%, respectively. The remaining four indices are based on the four branch-specific employment indices present in *Sindacato e Corporazione*, which I correct for changes in the hours worked, using data on average monthly hours from Zamagni (1994). The adjustment is only made for the pre-1935 years, since the

Sindacato e Corporazione indices take into account changes in the number of hours worked following the reduction in the working week which occurred as of the end of 1934.

Silk: In his doctoral thesis, Albert Carreras (1982) discusses the poor quality of the available series for the production of reeled silk from ASI. He matched these data with data on imports and exports in order to calculate presumed consumption, showing how, if the ASI data were correct, this indicator would be negative for a significant number of years. This consideration led Carreras to conclude that there must be some 'recursive mistakes in the estimation of the production figures' (Carreras, 1982, p. 956) and to construct a new series for apparent consumption which is based on the data relative to the production of cocoons and silk waste. Carreras' skepticism with the ASI series is, indeed justified⁵⁷. In ASI (1933), it is explained that the data, which were provided from the *Ente Nazionale Serico*, 'only represent the quantity of silk which *is possible* to obtain' (ASI, 1933, p. 171), rather than the one which is actually obtained. In this respect, Carreras is right in ignoring the official data and constructing a different index. Yet, the apparent consumption series constructed by Carreras (1982) on the basis of data on cocoons and waste is not the best possible choice to represent what occurred to the 'silk' industry. This is due to two methodological issues, which make the series inconsistent with the qualitative historical evidence. The first point concerns the fact that Carreras and Felice (2010) use data relative to natural silk to retropolate a benchmark which refers to *both*

⁵⁷For a critique relative to official data relative to an earlier period, see Fenoaltea (2003a, p. 725).

natural silk and artificial fibres. In the 1937-9 IC, the two industries were lumped in the same category, making it impossible to separate them. This is a problematic choice since, throughout the 1930s, artificial fibres such as rayon or ‘lanitel’ displaced natural fibres. This policy was actively encouraged by the regime in its attempt to limit the Italian dependence on foreign raw materials. As the crisis of natural silk was partly due to its displacement by artificial fibres, relying on the production of natural silk to proxy both categories will ignore this process of displacement and artificially attribute to both products a crisis which affected only one of them. The second point relates to the fact that the Carreras-Felice series misrepresents even what was happening to natural silk. The series employed by the authors is based on the production of cocoons and of silk waste. However, this indicator does not adequately capture what was happening to silk reeling, which reached the trough of its cycle a year later than the trough for the production of cocoons. This discussion suggests that one should look for a different indicator to describe the cycle of the silk industry. Three different elementary series are used in this work. The first series is the Carreras (1982) series relative to the production of cocoons. The second one is based on the production of reeled silk and is taken from *Sindacato e Corporazione*. The third series, relative to the twisting and weaving of *both* natural and artificial silk, is based on the number of frame-hours, taken from ASI. This choice is in the same spirit as the one made by those who produced the index by *Sindacato e Corporazione* and is supported by the analysis made using data for the cotton industry. An important advantage of using data on the utilisation of frames is that this indicator refers to *both* natural silk and artificial fibers. As it is explained in Banca d’Italia

(1938, pp. 819 and 868), the data refer jointly to the weaving of rayon and of natural silk, as the two production processes happened in the same plants. By relying on this indicator, one can therefore avoid ignoring artificial fibers, as it was effectively done by Carreras and Felice (2010). As a last point it is important to mention that, ideally, I would have liked to separate twisting from weaving. However, data on the activity rate of twisting spindles for the silk industry were first published on the statistical handbook in 1934. Data for the activity rate of twisting spindles in plants producing twisted artificial silk are available since 1929. However, correlations show that these data do not offer an adequate representation of the natural silk segment of the silk industry, which is why it is preferable not to use them. As for the weights, it must be added that the silk industry offers a clear example of the problems associated with using employment to weight different series as done in the index by *Sindacato e Corproazione*. Labour-intensive silk-reeling would be given a much larger weight than silk weaving, despite its far smaller value added. Hence, the three series are assigned weights which are based on value added from the 1937-9 IC, that is 2%, 10% and 89%.

Cotton: The new series is based on data on the physical production of spun and woven cotton which was collected by the *Istituto Cotoniero*, a voluntary cartel encompassing all producers of woven cotton⁵⁸. The data is published in ASI. Because of data limitation, data for the quantity of spun cotton is based on the number of tonnes of yarn. Data for the quantity of woven cotton is obtained using information on the number of meters of yarn converted into cloth. As argued by Fenoaltea

⁵⁸The cartel became compulsory with the R.D.L. 3rd March 1934, n. 291.

(2003a), the length of the cloth is deemed to be a better measure of output than weight as it allows to control for changes in quality.

Wool: For the wool industry, two elementary series are constructed, both on the basis of information from ASI. For wool weaving, data on the number of active frames are used, while, for the spinning industry, information on the total number of active spindles is employed. Unfortunately, the data do not allow to control for changes in the number of hours the machines are used for on each day. Because of data limitations, the values relative to 1928 are calculated by extrapolating the 1929 figure using the relative series for cotton weaving and spinning.

Jute, hemp and linen: For the jute, hemp and linen industries, I draw on the indices from *Sindacato e Corporazione*, which are based on data on capacity utilisation. For hemp and linen, two indices, one for spinning and the other one for weaving, are employed. For jute, I only employ one index, which is constructed as the simple average of the two indices in *Sindacato e Corporazione*, one relative to spinning and the other one to weaving.

Timber, furniture, clothing and leather: Series for value-added in timber, furniture, clothing and leather industries are based on data on the total number of hours worked, following the methodology outlined in Appendix 2.A. For all three branches, for the period between 1931 and 1936, data from Banca d'Italia (1938) are used. For the timber and furniture industry, the data from Assonime for the

years 1928-1930 and 1937-1938 are linked with the Banca d'Italia data relative to the years between 1931 and 1936. For the individual branches of the clothing, leather and "various" textiles industry relative to the 1928-1931 period, more aggregate data from Assonime are employed. These data combine the clothing and the textile industries. As for the post-1936 period, more disaggregated data from Assonime are used. The three series are linked in 1931 and in 1936. It must be added that a possible alternative strategy for the pre-1932 years would be to use data from the *Bollettino del Lavoro e della Previdenza Sociale*, a different coeval source covering the period 1920-1935 offering a better disaggregation at the branch level. However, this source does not include exact data on the number of hours worked, as it only states the number of workers employed for a number of hours which is "normal", "larger than normal", or "smaller than normal". However, from careful inspection of the source, it is clear that the more aggregate index from *Assonime* is representative of all the different branches in the two industries, as they follow similar trends.

Construction: The new series combines three separate indices. The first one, relative to public works, is based on the number of hours worked in the construction industry. It employs the index from *Sindacato e Corporazione* based on the total number of days worked and corrects it for changes in the number of daily hours worked using data from Zamagni (1994). A possible alternative would have been to use data on the funds allocated to public works at the end of each year, deflated by the price level of construction. The two series are highly correlated with this other indicator showing a slightly less pronounced cycle, which, however, would not

substantially change the overall estimates for the sector. We prefer to rely on the number of hours worked as it is unclear whether the data on funds account exactly for the public works which have taken place in a given year, or include data on public works occurring over a long time span and still in place at the end of that particular year. This last interpretation may help to explain the smoother cycle displayed by this particular index. The second series, relative to non-residential buildings, is the new index of industrial production in manufacturing. This strategy is adopted as there is limited data on the construction of non-residential buildings. The only direct evidence concerns construction permits for industrial plants, presented in Santarelli (1941), which, however, only covers a limited number of years. This limited sample is used to test our preferred indicator against a possible alternative, that is using the series for private housing as a proxy non-residential buildings. When this is done, we find that the index of industrial production in manufacturing is a better proxy. As for residential buildings, data on construction permits released in all the Italian *capoluoghi*, that is provincial capitals, are used. Data on construction permits are hard to track as the sample monitored by the relevant industrial confederation, the *Federazione Nazionale Fascista della Proprietà Edilizia*, changes over time. The evidence presented in ASI comes from a publication by the *Federazione Nazionale Fascista della Proprietà Edilizia, Il Mercato Edilizio*. The various issues of this publication show that the monitored sample changes from the 17 main *capoluoghi*, to the main 22, to a new, different, sample of 17. We choose a different sample, taken from ASI, as it is large and stable over time. The data for 1937 and 1938 are extrapolated using the data of the permits released in the main 17 *capoluoghi*. In

terms of weights, I rely on data on the value of different types of construction works, as presented in the 1937-9 IC. The weights I employ are, therefore, 52% for public works, 14% for non-residential buildings and 34% for residential buildings.

	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
<i>Cotton (spinning)</i>	1268	1260	1145	1045	1073	1104	1027	813	782	813	840
<i>Cotton (weaving)</i>	1472	1473	1313	1152	1177	1225	1140	943	972	909	948
<i>Silk</i>	2250	2295	2095	1435	1488	1380	1368	843	1264	1246	793
<i>Wool (spinning)</i>	1191	1249	1183	1028	1440	1638	1331	1177	534	891	754
<i>Wool (weaving)</i>	637	674	641	610	766	892	725	643	290	458	375
<i>Hemp and linen (spinning)</i>	33	64	37	34	22	35	47	95	142	183	194
<i>Hemp and linen (weaving)</i>	13	45	20	19	13	24	33	76	119	148	160
<i>Jute</i>	221	233	199	171	155	189	213	221	163	165	155
Textiles	7085	7292	6633	5495	6134	6487	5885	4811	4266	4812	4219
Mechanical Engineering	7754	8547	7357	5429	5548	7643	8422	9030	7568	8339	9378
Timber and furniture	1397	1528	1483	1344	1303	1434	1535	1666	1212	1396	1244
Clothing and leather	3172	3536	3332	2799	3375	3932	3574	3661	2998	3822	3715
Manufacturing	33348	35852	32982	28361	30115	34236	33897	35292	32045	36405	38844
Construction	4078	5391	6272	5847	5597	6152	7089	8151	7658	6003	4972
Industry	41085	45139	43397	37956	39283	44156	45043	47955	44400	47779	48074

Table 2.3: The Carreras-Felice series, 1928-1938, 1938 million lire

Sources: see text

	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
<i>Cotton (spinning)</i>	952	1035	866	722	796	898	815	806	661	882	840
<i>Cotton (weaving)</i>	895	972	800	693	704	813	804	817	787	926	948
<i>Silk</i>	941	969	892	851	608	703	733	711	689	918	793
<i>Wool (spinning)</i>	698	758	729	679	658	729	751	740	659	781	754
<i>Wool (weaving)</i>	415	450	432	406	378	394	379	398	347	403	375
<i>Hemp and linen (spinning)</i>	149	145	124	114	126	133	125	169	154	195	194
<i>Hemp and linen (weaving)</i>	171	177	157	140	124	126	128	156	132	163	160
<i>Jute</i>	156	164	141	125	106	119	139	137	125	151	155
Textiles	4376	4670	4143	3731	3499	3917	3874	3935	3554	4420	4219
Mechanical Engineering	7069	7394	6892	5477	4376	4728	5151	6473	7973	9079	9378
Timber and furniture	1094	1096	1015	954	835	807	920	1032	1038	1134	1244
Clothing and leather	4797	5188	4619	4170	3419	3633	3748	3640	3408	3890	3715
Manufacturing	32262	34337	31881	28504	26663	28623	29041	32157	32988	37759	38844
Construction	5634	7484	7670	6259	6282	7829	8149	7679	5581	5030	4972
Industry	40567	44678	42660	37635	35737	39423	40381	43395	42253	46961	48074

Table 2.4: The new series, 1928-1938, 1938 million lire

Sources: see text

2.C Regression results

The regression equation, relative to three branches of the mechanical engineering industry, is the following:

$$prod_t = \beta_o + \beta_1 metals_t + \beta_2 hours_t + \epsilon_t \quad (2.1)$$

where *prod* is a branch-specific index of industrial production, *metals* is an index of the apparent consumption of metals, as in Carreras and Felice (2010), and *hours* is a branch-specific index of hours worked. The results of these estimations are presented in Table 2.5, together with models in which the dependent variable is regressed only on one of the two independent variables. The regression analysis confirms that the apparent consumption series has little to add to the branch-specific hours of work series, as it appears to be statistically insignificant in almost all cases. Conversely, the indices of hours worked are always significant at the 1% level, proving to be a much better proxy for the behaviour of production in these three branches of the mechanical engineering industry for the period. When both variables are regressed on *prod*, *metals* is never significant, and the *R – squared* is always almost identical to the one obtained when only using *hours* as the dependent variable.

	Shipbuilding			Rolling Stock			Motor Vehicles		
	(1) PROD	(2) PROD	(3) PROD	(1) PROD	(2) PROD	(3) PROD	(1) PROD	(2) PROD	(3) PROD
METALS	-0.045 (0.05)		-0.095 (0.17)	0.628 (0.88)		0.599 (1.25)	1.295* (2.05)		-0.127 (0.49)
HOURS		1.286*** (3.56)	1.288*** (3.36)		0.856*** (3.34)	0.851*** (3.42)		1.371*** (11.28)	1.420*** (8.77)
CONSTANT	58.192 (0.84)	-59.366 (1.81)	-51.639 (0.90)	2.537 (0.04)	-33.847 (1.25)	-82.505 (1.75)	-39.913 (0.76)	-32.553*** (3.56)	-25.629 (1.49)
<i>Observations</i>	11	11	11	11	11	11	11	11	11
<i>R-squared</i>	0.00	0.58	0.59	0.08	0.55	0.63	0.32	0.93	0.94
t-values in brackets *significant at 10%; **significant at 5%; ***significant at 1% Regressions are run with OLS									

Table 2.5: Results of regression 2.1 for shipbuilding, rolling stock and motor vehicles

Chapter 3

The Italian Climacteric[†]

3.1 Introduction

How fast was productivity growth during the Fascist era? This question has been the subject of endless controversy among economists and economic historians. Some have argued that this was a period of slow economic and technical progress, characterised by a slowdown in the rate of growth of productivity (Ciocca, 2007). Others have put forward the idea that Fascism was a ‘developmental dictatorship’ (Gregor, 1979), with technological innovation leading to fast productivity growth. This school of thought argues that, far from being a period of stagnation, the interwar years were the springboard for the fast economic development which Italy experienced during

[†] *This paper benefited from comments by Bob Allen, Nicholas Dimsdale, Emanuele Felice, Claire Giordano, Knick Harley, Marco Maffezzoli, Anna Missiaia, Tommy Murphy, Tamas Vonyó and from participants to seminars at Oxford, Bocconi and Groningen Universities. I am grateful to my supervisor, Brian A’Hearn, for encouragement and many helpful suggestions, as well as to Steve Broadberry, Claire Giordano, Mark Spoerer, Alan Taylor, Michelangelo Vasta, Giovanni Vecchi, Tamas Vonyo, Jeffrey Williamson and Francesco Zollino for sharing with me unpublished work and data. The usual disclaimer applies.*

the Golden Age (Petri, 2002).

This controversy is particularly hard to solve because of the absence of a GDP series covering the interwar era which economists and economic historians can agree upon. Ever since the first attempt by ISTAT (1957a), a number of different series have been produced. However, none of them has been unanimously seen as an acceptable starting point for an analysis of the Italian economy during the period. The absence of a common basis on which to build the analysis has, quite obviously, not prevented scholars from attempting to describe and analyse such trends. However, adjudicating among the different opinions on this period of Italian history is an extremely hard task, as the conclusions reached by each scholar largely depend on their choice with regard to the GDP series.

The problems associated with the lack of a reliable GDP series spill over into the analysis of productivity growth. The most widely used indicator to understand the sources of economic growth - total factor productivity - usually relies on data from the primal side and therefore on the good quality of national accounts. A project coordinated by the Bank of Italy is working in the direction of building a new series covering the entire period between 1861 and 2011, but the fruits of this effort cannot yet be reaped¹. In the meanwhile, scholars interested in the evolution of the Italian economy during the Fascist era have to find alternatives to relying on primal side

¹The new series has now been completed. It was first presented in December 2011, after the submission of this thesis.

data².

This paper aims to evaluate between the “failure” and the “success” views by estimating measures of total factor productivity growth (TFPG) employing data on factor prices. It employs the dual approach to growth accounting popularised by Hsieh (1999; 2002) in his work on TFPG in the East Asian Tigers and applied by Antras and Voth (2003) to the case of the British Industrial Revolution. These price-based estimates of TFPG measure the outward shift of the factor price frontier as a share-weighted average of the growth rate of real factor prices. The key idea behind this procedure is that rising factor prices can only be sustained if output is increasing for given inputs. Its main advantage for our purposes lies in the fact that it allows one to reduce the role played by dubious primal side data, such as the national output series.

The new estimates presented here cover the period between 1890 and 1939, allowing one to compare the performance of Fascist Italy with the one of the late liberal Italy. They also have the advantage of being comparable to similarly constructed ones which have been obtained for Germany and Britain, allowing one to put the Italian experience in a comparative perspective. The framework is first applied to a two-factor model, which only looks at the role played by capital and labour and then expanded to explore the role played by *(a) land* and *(b) human capital*. This is done

²It is important to emphasise that the output series is not the only one suffering from important limitations. The reconstruction of a reliable series for the labour input has also proven particularly difficult for researchers. A pioneering effort was made in Rossi, Sorgato and Toniolo (1993), but, as it will be emphasised in Section 3.3.2, this series does not fall short of criticisms.

using a newly constructed dataset, which includes a range of new archival material with information on the evolution of the price of land and of the skill premium. The main conclusion of our growth accounting exercise is that total factor productivity severely slowed down during the Fascist period, reaching, in our preferred estimate, zero growth. For this reason, we define the era of Fascism as the Italian “climacteric”³. Changes in the specification of the model do not modify the main conclusion of the paper, which is also robust to a range of robustness checks.

The structure of the paper is as follows. Section 3.2, provides the main justification for the estimation of dual estimates of total factor productivity growth by outlining the problems with the current GDP series, particularly for what concerns the interwar era. Section 3.3 offers some historiographic evidence on the “success” and “failure” views on the Italian economy over the period and on the existing literature on Italian TFP growth. Section 3.4 briefly outlines the main model used in this paper. Section 3.5 presents the data and the results of the baseline model. Section 3.6 extends the baseline model by incorporating evidence on the role of land and human capital. Section 3.7 compares the new estimates with similarly obtained ones for Britain and Germany, allowing one to put the Italian experience in a comparative perspective, while Section 3.8 concludes.

³As it will be explained more lengthily in Section 3.7 this word has been used to describe the experience of the British economy at the turn of the 20th century, when it underwent ‘a sharp reduction in trend growth and a cessation of TFP growth’ (Crafts, 2004). As the dual procedure we employ in this paper does not allow one to pinpoint what happened to economic growth, our use of the word “climacteric” only refers to the second part of the definition given by Crafts.

3.2 The controversy over the GDP series

Unfortunately for the scholars interested in studying the evolution of the Italian economy over the interwar era, there exists no second-generation estimates of GDP for the period⁴. The construction of a GDP series relative to the period between 1861 and 1913, recently completed after many decades of meticulous work by Fenoaltea (2005b) will, at the very least, help researchers to put future discussions on the evolution of the economy until World War I within a common framework. This is a privilege which already exists for the researchers who look at the period after 1951, where the Golinelli and Monterastelli (1990) series is seen as almost completely reliable⁵. For the intermediate period, however, the picture is more unclear and no fully reliable estimates exist.

The earliest attempt to construct a GDP series for Italy was the *Indagine di Statistica sullo sviluppo del Reddito dell'Italia dal 1861 al 1956* (ISTAT, 1957a), which reconstructed the expenditure side of GDP at both current and constant (1938) prices. The GDP estimates obtained from the output side were initially constructed only at current prices. The work was completed by the so-called "Ancona Group", led by Giorgio Fuà, which reconstructed the output side series at constant prices (Fuà, 1978). The combined effort of ISTAT and of the Ancona Group led to a set of series which are currently known as the ISTAT-Fuà series. Unfortunately for those who

⁴An excellent outline, which I use as a very helpful basis for this section, is Fenoaltea (2010).

⁵To be completely precise, the level of the existing series for the period between 1951 and 1970 may change as a result of the incorporation of the benchmark for 1951, as estimated in Rey-Banca d'Italia (1992; 2000). However, the cyclical component seems rather uncontroversial.

have tried to test the robustness of the series, Fuà (1978) only presents very short descriptions of the sources and methods used to elaborate it. This is of particular importance, in light of the many criticisms the series has attracted⁶.

A second series was constructed by Angus Maddison (1991), who recalculated the growth of the Italian economy for the period between 1861 and 1989, using a series at constant (1985) prices. Maddison corrected the industrial series by ISTAT-Fuà series by accepting the revisions made by Fenoaltea (1972; 1982b; 1986; 1987; 1988a; 1988b) for the industrial sector for the period until 1913. Despite these improvements, the data for the service and the agricultural sectors and for industry after 1913 were still the same as for the ISTAT-Fuà series. This means that the short- and medium-term movements at the aggregate level remained essentially the same as the original ISTAT-Fuà series (Fenoaltea, 2010).

A third series was produced by Rossi, Sorgato and Toniolo (1993) in a pioneering piece of work which underpins their own estimates of TFP growth. This series, starting in 1890 and ending in 1990, uses two new benchmarks for the years 1911 and 1951. The first benchmark comes from the data collected in Rey-Banca d'Italia (1992), while the second one comes from Golinelli and Monterastelli (1990). The main problem with this series is that, for the interwar years, the authors use the cyclical component of the ISTAT-Fuà. Hence, it is only the use of the new benchmarks that makes the series by Rossi, Sorgato and Toniolo different from the original

⁶For an overview, see Fenoaltea (2005b) or Bardini, Carreras and Lains (1995).

ISTAT series: if one distrusts the way in which the original ISTAT series was constructed (and there are some good reasons to do so), one necessarily has to distrust the Rossi, Sorgato and Toniolo (1993) series, as well as the one by Maddison (1991).

A much larger project, led by Guido Rey for the Banca d'Italia (1992; 2000), has reconstructed estimates of value added at current prices for the agricultural, industrial and service sectors for the benchmark years 1891, 1911, 1938 and 1951. The main problem with the new estimates, however, is that the Banca d'Italia is yet to present the results of the last stage of this study, the one involving the reconstruction of the entire series and not just of the benchmarks⁷. Canullo (2000) elaborated a first reconstruction of the series at current and constant prices based on these benchmarks for the period between 1891 and 1998, but his cyclical dynamic in between the benchmarks is, once again, based on the original ISTAT (1957a) series. More recently, Carreras and Felice (2010) have used these benchmarks to construct the first set of estimates of industrial value added for the period between 1911 and 1938 not based on the ISTAT-Fuà cycle, but on 86 specific series which are largely taken from Carreras' doctoral thesis (Carreras, 1982). However, as it has been remarked in Chapter 2 of this thesis, these series misrepresent the behaviour of the secondary sector during the Great Depression cycle. Furthermore, they would still need to be complemented by series for the agricultural and service sector. A project coordinated by the Bank of Italy is working in the direction of building a new GDP series covering the entire period between 1861 and 2011, but this has not yet been published. Until that

⁷The new series has now been completed. It was first presented in December 2011, after the submission of this thesis.

occurs, any evaluation of the performance of the Italian economy in the interwar era based on the analysis of the Italian GDP will attract the same skepticism as the underlying series the analysis is based upon.

3.3 The existing evidence

The previous Section has outlined the main problems with the existing GDP series covering the first half of the twentieth century. For scholars interested in evaluating whether the Italian economy during the Fascist era was a “success” or a “failure”, this is important in two respects. Firstly, the data on GDP offer some important initial evidence, which is useful to assess how well an economy did during a given era. Secondly and more importantly for the purposes of this paper, the data from the national accounts are a crucial building block to construct primal estimates of TFPG. Data on the evolution of TFP provide good *prima facie* evidence on the ability of an economy to generate economic growth independently of factor accumulation. When TFPG estimates are obtained from the primal side, the evolution of the Solow residual is only as reliable as the output and input series used to make the calculations. If GDP growth is overestimated for a period, and the changes in the growth rate of the different inputs are not, then the Solow residual will be biased upwards, suggesting the presence of increments in productivity which never occurred.

A correct estimation of TFP growth in the period is particularly important. The growth of total factor productivity may be driven either by the shift of resources out

of low-productivity sectors, such as agriculture, to high-productivity sector, such as industry, or by technical progress. In the Italian case, there is little controversy over the important role played by structural change in fostering total factor productivity growth over the period⁸. During the interwar era labour moved from the primary to the secondary and tertiary sectors at a relatively fast pace. According to data from the population census, the share of employment in agriculture fell from 59.1% in 1921 to 52% in 1936, with services and industry gaining, respectively, 3.1 and 4 percentage points. It is therefore no surprise that Petri (2002) has described the 1920s and 1930s as the first phase of the age of industrialisation. This phase only ended in 1962, when industrial output and employment overtook comprehensively agricultural output and employment⁹.

While there is relatively little debate on the importance of structural change throughout the 1920s and 1930s, the historiography appears to be divided over whether or not the Fascist regime was successful at generating technical progress. Two main views have emerged in the literature. The first one, supporting the view of Fascism as a process of economic modernisation, has traditionally been associated with the name of Gregor (1979), who defined Fascism as a “developmental dictatorship”. More recently, a relatively benign view of the role of Fascism has

⁸This is consistent with the view that structural change was particularly important in helping the catching-up process by laggard countries throughout the late 19th and early 20th century. Broadberry (1998) has argued that this was at the basis of the process which led Germany and the United States to overtake Britain in terms of labour productivity.

⁹Although Italian industrial output had been higher than Italian agricultural output since the first half of the 1920s, it was only in the second half of the 1950s that industrial employment overtook the agricultural one.

been presented by Rolf Petri (2002), who has argued that the Fascist era was the springboard for the post-World War Two Golden Age. An opposite second view, underlining the failure of the Fascist regime at promoting technical change, has been presented by Toniolo (1980) and by Cohen (1988), whose work offers an outright rebuttal of Gregor's thesis. This critical outlook has been recently restated and refined by Ciocca (2007), with Giannetti (1998) and Vasta (1999) taking a somewhat intermediate position in the debate. This section, aims to offer an overall summary of the existing evidence on this issue. Section 3.3.1 summarises the main qualitative views present in the historiography. Section 3.3.2 presents the existing evidence on TFP growth, which is shown to be inconclusive in adjudicating the controversy.

3.3.1 Technical progress in Fascist Italy

The view that Fascism supported the modernisation of the Italian economy has been traditionally associated with Gregor's work (1979). In his book, he defined Fascism as a developmental dictatorship, where 'the term "development" [...] refers to both modernisation [...] and industrialisation - the employment of technological innovation to enhance per capita productivity, the spread of commerce, and the expansion and diversification of manufacturing and extractive plants, as well as the steady and sustained growth of GNP' (Gregor, 1979, p. 305). This process came at the expenses of the labouring classes and used 'overt and subtle coercion', but was not simply aimed at serving the interests of the aristocracy, since it was 'instrumental to [*the country's*] overall developmental needs' (Gregor, 1979, p. 311). Such a program 'judged by purely economic criteria, produced good results' (Gregor, 1979, p. 316)

particularly because it came at a cost which, in terms of coercion, was relatively small. A second, more recent, positive account of the ability of Fascism to promote technical growth can be found in the work of Rolf Petri. In Petri's view, there was a substantial continuity between the economic policy of the Fascist era and the one of the post-war Golden Age¹⁰. Industry underwent an important modernisation process and some branches of manufacturing - mainly chemicals and the utilities - developed some fundamental innovations, whose timing enabled Italy not to be left behind in an era of significant technical change (Petri, 1997, pp. 245-7).

These accounts describing Fascism as successful at promoting technical change have not remained unchallenged. In his account of the Italian economy during the Fascist era, Gianni Toniolo flatly states that, during the interwar years, 'Italy lacked a stimulus to the accumulation of factors of production deriving from technological development or from growing productivity' (Toniolo, 1980, p. 299). This was partly due to the policies enacted by the regime: in his rebuttal of Gregor's work, Cohen (1998) stressed how 'many strictly fascist policies, such as the revaluation of the lira (the so-called *Quota 90*), compulsory cartelization, prohibitive agricultural tariffs, investment and import licensing, and restrictions on labour mobility, raised the costs of doing business, promoted price rigidities, and led to an inefficient allocation of labour and other inputs, none of which [...] favoured economic expansion' (Cohen, 1988, p. 110). In fact, in his recent book on the economic history of Italy, Pier-

¹⁰Petri argues that the Italian economy did not fully take off in the 1930s because of four factors: overpopulation, the international trade slowdown, lack of raw materials and excessive dependence on foreign imports. 'When, in the 1950s, these knots were undone, the structural movement of the economy underwent a decisive acceleration' (Petri, 2002, p. 28).

luigi Ciocca claims that these policies limited ‘the tendency by industrial firms to search for productivity through innovation, technological change and rationalisation of productive structures during the recessions’ (Ciocca, 2007, p. 213). Although the pessimist school does not deny that Italian productivity growth may have benefitted from some sort of structural change both between macro-sectors¹¹ and within industry, these positive factors do not appear sufficiently significant to compensate for the negative impact of industrial policy.

A somewhat intermediate position between these two schools of thought has been taken by Renato Giannetti and Michelangelo Vasta, who have looked more specifically at the regime’s and at the individual firms’ attitude towards innovation. On the positive side of things, Vasta (1999, p. 1088) remarks how, since at least 1926, the regime attempted to pursue policies aimed at actively promoting the application of science and technology within the Italian economy. In fact, he argues that the regime had understood the huge potential which scientific and technological research had for Italy¹². Among the examples he cites to support this hypothesis, Vasta refers to the range of research institutes created by the regime, including the one for the study of fossil fuels which was established in Milan in 1927, as well as the reorganisation of the Italian research council, the *Consiglio Nazionale delle Ricerche*

¹¹‘The shares of industry and of the tertiary sector increased, both in terms of value-added and of employment [...] At the end of the Fascist period, the Italian economy was more tertiary than industrial’ (Ciocca, 2007, p. 209).

¹²Viale (1996, pp. 31-2) holds a similar view. He argues that the realisation by the regime of the importance of the role played technology can be traced back to World War One. The war had, in fact, shown how science and technology could be an important tool to strengthen the international position of Italy.

(CNR), which had originally been set up in 1923. Individual firms also contributed to innovation. According to Giannetti (1998), in fact, throughout the interwar years Italian businesses showed a remarkable capacity to adopt foreign technology, a claim which he supports citing a range of case studies by Petri (1997a; 1997b) which we will lengthily describe in Chapter 4.

These positive elements were accompanied by a range of more negative factors. Partly because of a range of inherent weaknesses of the Italian innovation system¹³, the regime's policies fell short of their objectives. Despite the rhetoric in favour of innovation, state funding towards R&D remained low, and, during the autarkic period, was wasted to pursue a range of scientifically unsound projects (Vasta, 1999, p. 1088). As for the attitude of individual firms, Giannetti (1998) stresses how these failed to turn from imitators into innovators. His evidence on the patenting activity of Italian enterprises shows that, although Italy's relative position compared to other European countries remained stable throughout the interwar years, the number of *per capita* patents obtained by Italian citizens in the US¹⁴ fell continuously throughout the 1930s¹⁵.

¹³Vasta (1999, p. 1089) refers to the limited interest of entrepreneurs towards technology, the faults of Italian bureaucracy and the generalised failure of the Italian education system.

¹⁴The data from the US patent office permit a meaningful comparison of patenting activities in different countries, as they allow researchers to overcome the problems associated with the fact that different countries may have different criteria for awarding a patent. The Italian *ufficio brevetti*, for example, was particularly loose when awarding patents as it did not collect information on the originality and usefulness of a given patent (Giannetti, 1998, p. 47).

¹⁵These figures are complemented by the statistics presented by Vasta (1999, pp. 1119-20) on the number of patents awarded in the US to Italian citizens (taken as a proportion of those awarded to all foreign citizens). This figure, which had almost quadrupled between 1891 and 1911, fell by more than a third between 1921 and 1941.

3.3.2 The existing evidence on TFP growth

To adjudicate between the optimistic and the pessimistic view, one strategy is to look at the evolution of total factor productivity growth in the Italian economy over the period and to compare it with what occurred in other periods of Italian history and in other countries. There is surprisingly limited evidence on this measure, most of which is tied to the work of Rossi and Toniolo (1992; 1993)¹⁶. Rossi and Toniolo estimated TFP growth for the Italian economy using the dataset from Rossi, Sorgato and Toniolo (1993), including, among a range of other economic indicators, the GDP series which I have described at length in Section 3.2. Differently from the growth accounting approach taken in this paper, Rossi and Toniolo chose to estimate TFP growth econometrically. Drawing on the work by Morrison (1988; 1992), they employed a Generalized Leontief production function to estimate a primal measure of TFP growth (the output elasticity with respect to technology), and a dual measure, (the cost elasticity with respect to technology). The main advantage of the model employed by Rossi and Toniolo is that, differently from the standard models used in most computations of total factor productivity, it allows them to adjust the residuals by taking into account the existence of quasi-fixed factors, economies of scale and market power.

The authors apply this technique to two different models: in their 1992 paper, which analysed the behaviour of the Italian economy over the 1895-1939 period,

¹⁶Broadberry, Giordano and Zollino (2011) are producing new estimates of TFPG for the Italian economy over the 1861-2011 period using the new GDP data produced by the Bank of Italy. However, their results were published only after the submission of this Thesis.

they estimated TFP growth assuming a production function with two variable inputs (labour and imports) and a quasi-fixed one (capital). In their 1993 paper, instead, which covered the entire 1893-1990 period, they estimated a five-factor model, with three variable inputs (labour, energy imports and other imports) and two quasi-fixed ones (private and public capital). The results are different depending on the model chosen and on whether the residual is adjusted or not. The fact that, in the different papers, the authors chose different temporal benchmarks makes the comparison of the results even harder.

Table 3.1 presents the results obtained by Rossi and Toniolo using their 1992 three-factor model¹⁷. The unadjusted primal and dual measures for the Fascist era (1925-1939) are equal, respectively, to 1.4% and 1.8% per year. Both measures compare extremely well with the residuals for the other periods: the dual measure is higher than for any other period under consideration, while the primal measure is higher than the one for all the other periods but 1895-1905. When the authors adjust the residuals to account for the presence of market power, economies of scale and capacity utilisation, both the dual and the primal residuals for the period 1925 to 1939 fall to 0.0%. In both the primal and the dual cases, this is a performance which is slightly worse than the one relative to the overall 1895-1939 period.

The picture changes if one looks at the results obtained by Rossi and Toniolo (1993) using a five-factor model, which are also described in Table 3.1. Firstly, the

¹⁷In order to facilitate comparability, the dual measure, representing a potential cost reduction for given factor inputs, is expressed in positive terms when showing an improvement in the residual.

	Unadjusted		Adjusted	
	<i>Primal</i>	<i>Dual</i>	<i>Primal</i>	<i>Dual</i>
Rossi and Toniolo (1992)				
1895-1905	1.6	0.8	-0.1	-0.3
1905-1925	1.0	0.2	0.2	0.2
1925-1939	1.4	1.8	0.0	0.0
<i>1895-1939</i>	<i>1.3</i>	<i>0.8</i>	<i>0.1</i>	<i>0.1</i>
Rossi and Toniolo (1993)				
1893-1914	1.69	2.64	1.54	2.66
1919-1939	0.67	2.85	1.61	2.45
1946-1963	5.14	6.24	2.26	4.59
1964-1973	4.14	4.07	0.57	0.67
1974-1990	0.89	0.99	-0.68	-0.86
<i>1893-1990</i>	<i>1.46</i>	<i>2.91</i>	<i>0.87</i>	<i>1.64</i>

Table 3.1: Total factor productivity growth (in %, per annum)
Sources: Rossi and Toniolo (1992; 1993)

residuals are much higher for all periods, ranging, for the 1919-1939 era, from 0.67% to 2.85%. If one looks at the unadjusted primal measure of TFP growth, the interwar economy seems to be performing rather poorly. Conversely, the other measures for the Fascist era compare favourably with the ones of other periods. In particular, the adjusted primal measure for 1919-1939 (1.61% per year) is higher than any other period except for the Golden Age (2.26% per year), while the dual one is higher than the average for the entire period.

The number of models presented and the differences in the results obtained make it hard to understand whether, by looking at Rossi and Toniolo's work, one should consider the Fascist economy a success or a failure. In their article, the authors argue that 'the downturn of the Italian economy in the Fascist years incorporates a productivity slowdown' (Rossi and Toniolo, 1992, p. 551), which, much in the spirit of the pessimist school, they largely attribute to the policies enacted by the Fascist regime¹⁸. Despite this statement, however, the lessons to be drawn by the Rossi and Toniolo work appear much less conclusive. Firstly, one should remember that the primal estimates rely on a dataset which, although pioneering, is disputed. The problems are mainly associated with the employment of a GDP series based on the old ISTAT-Fuà cycle, but also extend to the series for the capital and labour¹⁹ inputs. Secondly, the unadjusted residuals relative to the interwar era obtained in both models appear to be very large if compared to those obtained for other countries and suggest that Italy was the success story of the interwar era. In fact, primal side estimates for TFP

¹⁸The policy environment of the mid 1920s and of the 1930s can be safely expected to have militated against productivity improvements: higher barriers to entry, a lower rate of exit of the inefficient firms, and more generally the encouragement of restrictive practices all played a significant role in accounting for Italy's productivity trends. However, over and above these elements [...] we consider that increased insulation of the Fascist economy from the outside world meant a sudden, large drop in the import of capital goods, thereby halting the ability of the economy to import technology' (Rossi and Toniolo, 1992, p. 551).

¹⁹Rossi, Sorgato and Toniolo (1992) are aware of the limitations of their pioneering work on the labour input, as they define their elaborations as 'adventurous' and 'approximative' (Rossi, Sorgato and Toniolo, 1993, p. 4 and p. 9). These problems include the decision to construct their series for industrial employment by interpolating the data from the 1911, 1927, 1937-40 and 1951 industrial (rather than population) censuses through a range of different indicators. This appears problematic, as the 1911 benchmark for industrial output, which they use to construct their GDP series, is obtained working on the assumption that the coverage of the 1911 IC was incomplete and that the population census should be used instead (see Fenoaltea, 2003b, pp. 1095-1097). This makes the output and labour input series largely incompatible with each other, adding a further bias to their primal TFP estimates.

growth in Britain during the 1920s and 1930s show that TFP grew at 0.6% per year (Crafts, 2004, p. 11). Even for the US, Kendrick (1961) reports primal estimates of average annual TFP growth which are equal to 1.4% for the 1920s 1.1% for the 1930s.

Rossi and Toniolo argue that looking at the unadjusted figure is misleading and that one should really look at the adjusted figures to evaluate the performance of the interwar era. Yet, there are at least two main problems with this statement. Firstly, when looking at the 1993 paper it is clear that the adjusted figures are supportive of the optimist view as they show growth in the residual which is larger than the 1893-1990 average. Secondly, the adjustments made do not look entirely convincing. The time-series showing the changes in the level of market power, economies of scale and capacity utilisation in the Italian economy appear, at least in part, unrealistic. What is particularly puzzling is the time series showing the changes in the level of market power in the economy. The first puzzling aspect is the size of the parameter. In their study of the concentration ratios of Italian industries, Giannetti, Federico and Toninelli (1994) find the level of market power obtained by Rossi and Toniolo to be implausibly high and inconsistent with their own micro-level evidence. A second aspect concerns the way in which this variable changed over the Fascist period. In their 1992 paper, the authors find that market power steadily declines from 1932 to 1937, a result which appears implausible in light of the historical evidence on the cartelisation of the economy occurring as of 1932²⁰. In their 1993 paper, this trend characterises the whole of the Fascist era, which would appear to be an era of *increas-*

²⁰For more details, see Chapter 4 of this thesis.

ing competition. These two results appear in stark contrast with the description of the era given by the two authors who, as we have seen, have emphasised the negative role played by the restrictive practices occurring at the time.

Despite their statement of allegiance to the pessimist field, Rossi and Toniolo present evidence which could easily be used by both sides. Furthermore, as noted by Federico, one wonders whether their results ‘are robust to changes in the database’ (Federico, 1996, p. 781). This relative inconclusiveness of their results suggests that a new look at what occurred to total factor productivity during the period would not be entirely out of place. Rather than relying on econometric modelling, this investigation will be based on a growth accounting framework. This framework limits as much as possible the employment of controversial primal side data and mostly relies on using data on factor prices. Throughout the exercise, a range of robustness checks are also performed so as to make sure that, when alternative data exist, their inclusion in the calculations does not affect the overall conclusions of this work.

3.4 The model

For the reasons described in Section 3.2, estimating primal measures of TFP growth will not be particularly useful until a new reliable series for GDP is constructed. In such circumstances, it is helpful to think in terms of dual estimates of productivity growth, which could then be compared to future primal estimates obtained using the

new GDP data. Rather than relying on the econometric estimation of the residual, this paper employs a dual growth accounting framework²¹ as popularised by Hsieh (1999; 2002)²² and employed by Antras and Voth (2003) to re-estimate TFP growth during the British Industrial Revolution²³. The baseline model assumes that the economy analysed has two factors of production, namely labour (L) and capital (K). This model can be extended to incorporate land and human capital, something which will be do in later Sections. Denoting time with t , I have that output (Y) is a function of K , L at date t .

$$Y_t = F(K_t, L_t) \quad (3.1)$$

Following Hsieh (1999; 2002), one can derive dual estimates of productivity growth on the basis of the national income accounting identity. This states that the value of national output has to be equal to the payments to the factors of production. Hence

$$Y_t = r_t K_t + w_t L_t \quad (3.2)$$

where w and r are the real wage and the real rental rate of capital. Differentiating

²¹As emphasised in Antras and Voth (2003), there is a long tradition of economic historians who have used factor prices to estimate productivity growth. The list includes, among many others, McCloskey (1972), Clark (1999) and McCloskey (1994).

²²Hsieh (1999; 2002) used this model to solve the East Asian productivity puzzle. A number of growth accounting exercises had found that the extraordinary rate of output growth experienced by some of the Asian Tigers was due to factor accumulation rather than to technical progress. Hsieh's dual estimates of total factor productivity growth showed how, in the Singaporean case, TFP growth was 2% higher than what was estimated using primal techniques.

²³Such estimates substantially confirmed the influential Crafts and Harley (1992) view of the British Industrial Revolution.

with respect to t gives

$$\frac{dY}{dt} = \frac{dr}{dt}K + \frac{dK}{dt}r + \frac{dw}{dt}L + \frac{dL}{dt}w \quad (3.3)$$

Dividing both sides by Y , and using a hat to indicate proportional growth rates, one obtains

$$\hat{Y} = \frac{dr}{dt} \frac{K}{Y} + \frac{dK}{dt} \frac{r}{Y} + \frac{dw}{dt} \frac{L}{Y} + \frac{dL}{dt} \frac{w}{Y} \quad (3.4)$$

Using a simple transformation (multiplying and dividing each addend on the right-hand side by, respectively, r , K , w and L), one can rewrite this as

$$\hat{Y} = \hat{r} \frac{rK}{Y} + \hat{K} \frac{rK}{Y} + \hat{w} \frac{wL}{Y} + \hat{L} \frac{wL}{Y} \quad (3.5)$$

Defining $\alpha = \frac{rK}{Y}$ and $\beta = \frac{wL}{Y}$ one can rewrite this as

$$\hat{Y} = \alpha(\hat{r} + \hat{K}) + \beta(\hat{w} + \hat{L}) \quad (3.6)$$

Where α and β are the shares of income going respectively to capital and labour. If one rearranges this, it is possible to obtain the following equation

$$\hat{Y} - \alpha\hat{K} - \beta\hat{L} = \alpha\hat{r} + \beta\hat{w} \quad (3.7)$$

Equation 3.7 implies that growth in the traditional Solow residual, as expressed on the left-hand side of the equation, is equal to a weighted sum of the growth rates of real factor prices. This is our dual measure of productivity growth. For this to

truthfully measure total factor productivity, one needs a number of assumptions. These include perfect competition and constant returns to scale, which guarantee that factors of production are paid the value of their marginal product.

It is clearly unlikely that these assumptions held over the period under considerations. To only give one example, as it is shown in Chapter 4 of this thesis, market power in the industrial sector, as measured by a range of indicators, increased throughout the 1930s. Yet, as evidence by Giannetti, Federico and Toninelli (1994) and Giannetti and Vasta (2006) shows, even in the secondary sector, market power has remained low by international standards. Since the economy as a whole is likely to have been characterised by a lower and more stable level of market power than industry, the assumption of perfect competition may be actually be seen as less restrictive than it is generally thought. Furthermore, as stressed by Hsieh (1999; 2002), these assumptions are exactly the same needed for the more traditionally used primal measures of productivity growth (the left-hand side of Equation 3.7) to be an unbiased measure of total factor productivity growth²⁴. This consideration guarantees that the measure presented here will suffer, in most cases, from exactly the same biases as the primal measure and will not be any worse than it. Since a range of studies on the evolution of TFP in the very long run in Italy (Broadberry, Giordano and Zollino, 2011) and abroad²⁵ have relied on the same set of assump-

²⁴The only exception to this result is that, for the equivalence between primal and dual measures of productivity, one relies on the consistency between the national accounts and the data on factor prices. This means, for example, that the two measures may differ when national output exceeds the sum of the payments to the factors of production.

²⁵For the case of Spain, see Prados de la Escosura and Rosés (2009).

tions, these estimates should be at least as good as those presented in these studies²⁶.

3.5 Alternative estimates of TFP growth for Italy

Having outlined the model, we can now proceed to apply it to the Italian case. We first present a baseline with two factors of production, namely labour and capital. In Section 3.6, we then incorporate new evidence on land rents and the skill premium to emphasise the problems associated with ignoring these factors of production. The periods of observation covered in this study are two, namely 1890-1913 and 1923-1939.

a) Returns to labour

In order to obtain a series for the change in the real returns to labour, we rely on the changes of an aggregate wage, which is a weighted average of the wages of different types of workers:

$$\hat{w} = \sum_{j=1}^m s_{l_j} \hat{w}_j \quad (3.8)$$

where s_{l_j} is the share of payments and $\hat{w}_j$ is the change in the wage of a worker of type j . Four types of workers are considered, that is those employed in agriculture, industry, service and P.A.

²⁶It should also be emphasised that models which were designed to account for changes in the level of market power can yield counter-intuitive result. As Section 3.3.2 of this paper has shown, this was the case of the results presented by Rossi and Toniolo (1992; 1993).

When estimating the returns to labour, we proceed in two different ways. A first calculation lets the share of payments s_{l_j} vary over time. This means that the movement of workers out of low-paid agriculture and into relatively high-paid industry and services makes the aggregate wage rise faster than if we had measured the aggregate wage for a given structure of the economy. The difference between the two measures is the effect of structural change. The resulting estimates of TFPG will, therefore, not control for its effect and will generally be higher than if we had controlled for it.

The second strategy, which is the one we use to construct most of the estimates in this paper, seeks to control for the effect of structural change. This is done by using the same shares of payments over the entire period under analysis. As a result, the movement of workers from low-paid agriculture in to high-paid industry and services will not affect the aggregate wage, whose rate of growth will be zero as long as the wage of a worker in a given sector does not change.

Although this second technique allows us to control for structural change occurring *across* the four macro-sectors considered, it does not allow us to control for structural change occurring *within* the four macro-sectors considered. Furthermore, it does not control for changes in the quality of labour due to educational improvements. To control for these effects, I would need a wider range of data on the wages of workers in different sectors and with different levels of educational attainment. Such data, unfortunately, does not exist, preventing me from increasing the number

of categories I aggregate in equation 3.8²⁷.

We can now turn to the different elementary series. The four elementary series employed are constructed as follows. For industry, for the Fascist era, we use an index of the hourly wages of industrial workers taken from Zamagni (1976). For the previous period, we rely on the index of the daily wages of industrial workers as in Scholliers and Zamagni (1995)²⁸. For agriculture, for the years 1923-38 we employ the elaboration by Zamagni (1980) of Arcari's (1936) hourly wage series relative to normal-time male workers²⁹. For the years 1905-1913, we apply the methodology used by Zamagni to Arcari's original data, so as to obtain a series which is consistent with hers³⁰. As for the years before 1905 and for 1939, in the absence of other sources, we assume that agricultural wages followed the same trend as industrial wages.

²⁷In Section 3.6, I partially address the problem of human capital accumulation by employing some limited evidence on changes in the skill premium.

²⁸Using daily wages could be problematic if there was evidence of substantial changes in the number of hours worked over the period. However, the limited available evidence shows this not to have been the case. Huberman's (2004) figures show that, in the Italian case, hours worked per week were roughly stable between 1890 and 1913, only falling from 63.6 hours in 1890 to 62.4 in 1913. This is equivalent, on average, to a fall of 0.08% per year. Accounting for this small change would not substantially change our results.

²⁹This choice is different from the one made by Rossi and Toniolo (1992; 1993), who rely on Arcari's original wage data. The advantage of using Zamagni's (1980) series is two-fold. Firstly, Zamagni's series completes Arcari's series by extending her dataset to the years between 1933 and 1938. Secondly, it has the further advantage of weighing the individual provincial series using data on employment, rather than relying on simple averages as originally done by Arcari. One potential problem with Zamagni's work is that she only concentrates on male wages. However, she does so as she finds this series to be the most reliable one. Furthermore, the exclusion of the lower wages relative to women and children is compensated by the exclusion of the higher overtime wages. For more details, see Zamagni (1980).

³⁰This means weighing Arcari's provincial wages for the years relative to 1905-13 using data from the 1911 population census.

For what concerns the service sector, the only available evidence are the daily wages of workers in retail and tourism, covering the period 1930-1938 (Zamagni, 1976, p. 32). We use these data and correct them for changes the number of hours worked per day³¹. For all other years, we have assume that the wage grew at the same rate as the one in the industrial sector. As for workers in the public administration, we use data on the daily wages of low ranking government employees (*applicato*), which is available from ISTAT (1958) over the entire period³².

Turning to the shares $s_{t,j}$, we use the daily wage data as described beforehand and multiply them by the total number of days worked in the different sectors of the economy³³. As explained beforehand, we calculate two different series for the change in the returns to labour. The first one allows the shares to vary over time. This means

³¹Differently from the pre-World War One era, these changed dramatically over the Fascist era. In the absence of evidence relative to how hours changed in the service sector, we use data on the number of hours worked in the industrial service (Zamagni, 1976, p. 370).

³²Once again, we control for changes in the number of hours worked per day by using the data relative to industrial workers (Zamagni, 1980, p. 370).

³³The calculation of the total number of days worked in each sector requires information on the number of workers in each sector and on the number of days worked, on average, in each sector. The data on the number of workers comes from the dataset underlying Broadberry, Giordano and Zollino (2011) to which we refer. As for the number of days worked, on average, in each sector, the evidence is extremely scanty, so one has to rely on previous approximations. For industry, it is assumed that this was 290. This figure is consistent with the coefficient chosen by Fenoaltea (1992, p. 141 and p.143) relatively to workers of large firms, which is what the Zamagni data used here mostly refer to (Zamagni, 1984, p. 60; Zamagni, 1976, p. 362). Further it is assumed that workers in the service and P.A. sectors worked for 270 days a year. As for the agricultural sector, it is assumed that labourers worked 230 days a year. This figure is consistent with the one chosen by O'Brien and Toniolo (1991) for "regular workers". As a last point, it is worth underlining that for both industry and agriculture we use the number of days relative to the category of workers which worked the most ("regular workers" for agriculture and "large and medium size firm workers" for industry). This may introduce an upward bias when calculating the total compensation going to both categories. However, since we are only interested in the *relative* sizes of the wage bills, this appears more acceptable than introducing biases going in different directions.

that the resulting TFPG figures will not control for structural change. The second one uses the shares as in 1911. The resulting TFPG figures will be lower and will control for structural change across macro-sectors. It is worth noting that the year chosen to calculate the latter estimates is 1911. This is done for consistency with the methodology used to calculate the factor shares, which are also based on 1911 data³⁴.

Finally, in order to deflate the individual series, the GDP deflator from Fuà (1978) is employed. This deflator has been subject to criticisms (Cohen and Federico, 2001). However, the only alternative (a cost of living index) would be inappropriate as it would suffer from the conceptual drawback of including the price of imports and excluding the one of exports (Antras and Voth, 2003, p. 64).

b) Returns to capital

The rental rate of capital is estimated using the Hall-Jorgenson (1967) formula

$$r = \frac{P_k}{P}(i - \pi + \delta) \quad (3.9)$$

One therefore needs data on the price of capital, the real interest rate and the depreciation rate. The price of capital comes from Fuà (1978) and corresponds to the gross private investment deflator. This is a weighted average of the prices of different types of investment goods³⁵. The depreciation rate comes from Rossi and

³⁴Using different weights would not significantly affect the results. For example, using 1938 weights instead of 1911 ones would increase the growth rate of the composite real wage by 0.08 percentage points for the 1923-1939 period, while reducing it by 0.06 percentage points over the 1890-1913 period. As for the overall effect on TFP growth, this would be even smaller.

³⁵The limited availability of data makes it impossible to account for changes in the quality of

Toniolo (1993), who calculate it using data on gross and net investments and on the capital stock taken from Fuà (1978).

The most problematic variable to calculate is the real interest rate. As discussed in Hsieh (2002), it is possible to employ two alternative methodologies. The first one is to assume that all assets earn a given nominal return and subtract the rate of inflation from the nominal rate. The second one is to use a market-determined real rate, such as the return to equity, dividend yield or the E/P ratio³⁶. To pursue the first approach, ideally one would need the nominal returns of an asset which is perfectly correlated with the country's capital stock. Since such an asset does not exist, one could replace it with information on the interest rate charged in the private sector³⁷. The major problem with this approach is that it obliges one to derive the estimated real rate by subtracting expected inflation from a nominal rate. In turn, this requires making the right assumptions with regard to inflation expectations, which is hardly a trivial matter (Hall, 1990)³⁸.

capital. However, as it is explained when discussing in details the results, this problem should not significantly bias this paper's estimates of TFP growth.

³⁶See Harper, Brendt and Wood (1989) for a comprehensive discussion of alternative methods for calculating the real interest rate.

³⁷In the absence of such data, scholars have used the interest on government debt. In particular, Rossi and Toniolo (1992; 1993) have used the interest on Italian consols, while Antras and Voth (2003) have used the one on British consols.

³⁸In the Italian case, Rossi and Toniolo (1992; 1993) have computed the expected real rate of interest as the one period ahead forecast of a second-order autoregressive rolling regression. However, in their study of the behaviour of the Italian consol rate over the 1845-1993 period, Muscatelli and Spinelli (2000) find that, during the pre-World War Two era expected inflation was equal to zero. This finding, which is broadly consistent with studies looking at the experience of interest rates in Britain (Barsky and Summers, 1988; Mills, 2008) and in other European countries (Chadha and Dimsdale, 1999), indicates that one should treat the nominal interest rate as the *de facto* real interest rate over the period.

In order to limit the pervasiveness of this problem, it is deemed preferable to follow Hall (1990) and employ a market-determined interest rate. This is possible for the interwar era, a period for which one can make use of the data on the aggregate return on equity of Italian manufacturing firms (Giannetti and Vasta, 2006)³⁹, which is used as the real interest rate in equation 3.9. Unfortunately, this particular source only covers the 1900-1971 period and there are no comparable studies relative to the 19th century. For this reason, for the pre-World War One era one has to revert back to the first approach and use an external rate of return⁴⁰. Rather than relying on the interest rate on government bonds as done in previous work⁴¹, it is deemed preferable to use data on the interest rate charged in the private sector. Hence, data on the interest rate charged on commercial paper yields as taken from the *Global Financial Data* dataset, are used. Following Muscatelli and Spinelli (2000), it is assumed that

³⁹Giannetti and Vasta (2006) examine 142,042 balance sheets from all the joint-stock companies belonging to the manufacturing sector, the mining sector and the utilities included in the different editions of the *Notizie Statistiche* from Assonime. The sample is very broad as it includes, on average, 80 to 90% of the total share capital of Italian firms in the analysed macro-sectors. The *aggregate* figure is preferred over the *average* figure as the latter measure would give an equal weight to all firms, independently of their size. Since there was no meaningful way to aggregate the data relative to all manufacturing, mining and the utilities, we chose to use the data relative to the first macro-sector as it is the largest and most significant of the three. For a discussion of the possible biases in the sample, see Giannetti and Vasta (2006, p. 155). For a discussion of how the return on equity was calculated, see Giannetti and Vasta (2006, pp. 156-7).

⁴⁰The conclusions of this paper are not affected by the decision to use different methodologies to model the interest rate in the two periods. If I used the interest rate charged on commercial paper yields as the relevant real interest rate for the interwar era, I would obtain an even slower growth of the real rental rate of capital than the baseline one. This would imply an even slower rate of TFP growth for the era than those presented in this work.

⁴¹Rossi and Toniolo (1992; 1993) rely on data from Fratianni and Spinelli (1991). For the period between 1890 and 1913, these data are the average yearly returns of the *Rendita Italiana*. For the period between 1914 and 1939, they are the Italian consol rate (see Fratianni and Spinelli, 1991, pp. 47-48).

expected inflation was zero over the period and therefore the nominal interest rate is treated as the real interest rate.

For both the pre-World War One era and the interwar eras, the conventional smoothing procedure designed by Hsieh (2002) is followed. Therefore, the growth rate of the rental rate of capital is calculated by dividing the point estimate of the time trend of the sum of the interest rate and the depreciation rate by its average value and adding this to the average growth rate of the relative price of capital.

c) Factor Shares

In addition to the the prices of the individual inputs, factor shares are needed to weigh their individual contribution. Two approaches have been pursued in the literature with regard to their calculation. One naïf solution is to assume that they are stable and equal to some predetermined level, which is often set equal to 0.3 for capital and 0.7 for labour on the basis of stylised facts regarding the American economy. Such a solution, however, may not reflect the reality of the Italian economy of the period. A second, more sophisticated, solution is to estimate factor shares for individual years and then use the average of the shares in the two years over which the growth rate of TFP is calculated⁴². Such procedure usually involves the direct estimation of the labour share and the calculation of the capital share as a reciprocal of the labour share. Hence it should be adopted when one is reasonably confident of the primal data used and when one wants to limit the analysis to a relatively small number

⁴²This approach has been adopted in the most recent studies on TFP growth. See Prados de la Escosura and Rosés (2009) or Young (1995).

of factors of production (usually two). This is not the case of this study, as the premise for computing dual estimates of TFP growth is, precisely, the relative unreliability of Italian primal data. Moreover, as we would like to expand our analysis to incorporate land as well as human capital, we cannot simply calculate the share going to labour and then assume that the share going to capital is one minus this figure.

The approach used here to calculate factor shares is, therefore, a different one. The general unreliability of Italian primal side data is, in part compensated by the quality of the data relative to some specific years. Because of the decision by the government to take both an industrial and a population census, the year 1911 is characterised by a wealth of data from the primal side which can be used for our purposes⁴³. In particular, one can rely on the social accounting matrix (SAM) produced by Federico and O'Rourke (2000) in order to construct a computational general equilibrium (CGE) model of the Italian economy⁴⁴. The SAM produced by Federico and O'Rourke builds on the benchmark estimates of Italian GDP for the year as in Rey-Banca d'Italia (1992), as well as on an input-output table by Vitali (1992). It assumes the presence of four primary inputs, namely labour, capital, human capital and land, which are conveniently those which this analysis is interested in examining.

⁴³The year 1911 also has the advantage of being conveniently located half-way through the period of our analysis, which spans between 1890 and 1939.

⁴⁴Federico and O'Rourke (1999) use this model to investigate the effects of protectionism on the 19th century Italian economy. Their findings are that the sectoral and redistributionary effects of the tariff were quite modest. Although CGE had been widely used in economic history (see, among others, Pope 1972; James, 1978; Harley, 1992; O'Rourke, 1997) the work by Federico and O'Rourke remains the only application of this type of modelling to the Italian case.

For these reasons the data thereby presented are employed to calculate the factor shares. In the initial two-factor analysis, which ignores the role played by land and human capital, the labour share is obtained by combining the shares of total output going to labour and human capital⁴⁵. The capital share is initially obtained combining the shares of income going to capital and land, and those collected as capital and land tax⁴⁶. As a result, a labour share of 0.54 and a capital share of 0.46 are obtained⁴⁷.

d) Estimates of TFP growth

Table 3.2 presents our preferred estimates of TFP growth in Italy for the periods under consideration, together with the unadjusted primal and dual estimates from Rossi and Toniolo (1992; 1993). The estimates presented in the Table are obtained using estimates of the returns to labour which net out the effect of structural change on TFPG. Another set of estimates, which does not net it out, is presented later on in this section. A comparison of the two sets is also included.

⁴⁵For details on how these figures were obtained, see Federico and O'Rourke (2000).

⁴⁶Production taxes are included following Young (1995, pp. 654-5): 'In order to estimate the share of labor and capital in total payments to factors of production, it is necessary to measure value added from the point of view of the producer. This requires removing all indirect business taxes on the value of output (including all sales and excise taxes), while retaining all subsidies and taxes on factors of production (such as license fees and profits taxes)'. It is important to notice that Federico and O'Rourke assume no taxes on wages.

⁴⁷This figure is similar to the one obtained by Matthews, Feinstein and Odling-Smee (1982) for pre-World War One Britain, as they assign a share of 0.57 to capital and one of 0.43 to labour. This comparison may appear surprising, given that Britain was a substantially more industrialised country than Italy. However, it must be recalled that the Italian share for capital was obtained summing the share for capital and the share for land. This factor of production is ignored in the British case as the share of land rent in total income during World War One is only 2% (see Section 3.7.2). When land is included as a separate factor of production (See Section 3.6.1), the structure of the Italian economy at the time will appear to be clearly different from that of the more industrialised Britain.

	$\hat{w}$	$\hat{r}$	TFP
Benchmark Estimates I			
1890-1913	1.80	1.12	1.49
1923-1939	0.90	-1.09	-0.02
Rossi and Toniolo (1992 - Primal)			
1895-1905			1.6
1905-1925			1.0
1925-1939			1.4
Rossi and Toniolo (1992 - Dual)			
1895-1905			0.8
1905-1925			0.2
1925-1939			1.8
Rossi and Toniolo (1993 - Primal)			
1893-1914			1.69
1919-1939			0.67
Rossi and Toniolo (1993 - Dual)			
1893-1914			2.64
1919-1939			2.85

Table 3.2: Estimates of TFP growth for Italy (1), 1890-1939 (in %, per annum)
Sources: see text and Rossi and Toniolo (1992; 1993)

According to the new results, the pre-World War One era was characterised by rising real wages and real rental rate of capital. Wages rose fast, particularly because of the increase in the wages of industrial workers, a pattern which Zamagni (1984, pp. 75-76) interprets in a Gerschenkronian fashion, that is as the result of fast industrialisation. The rental rate of capital also rose, largely because of an increase in

the interest rate, while the real price of capital remained more or less stable. The sustained increase in both factor prices led to an increase in the rate of TFP growth in the region of 1.5% per year, a figure which appears more than respectable.

Differently from the pre-World War One era, the interwar years look like a much bleaker time. The real wage rose, but at a much slower rate than during the period of the late liberal Italy⁴⁸. The rental rate of capital fell at a relatively fast rate, largely because of a quickly falling real price of capital, while the sum of the real interest rate and of the depreciation rate fell slowly⁴⁹. The implied performance of total factor productivity is particularly weak. In this baseline two-sector model, it is practically zero, showing a substantial slowdown from the rates achieved during the

⁴⁸The increase in real hourly wages is not in contrast with the finding by Zamagni (1976, p. 346), who has shown how Italy was the only country in Europe to experience a descending trend in the real wages of industrial workers. Her analysis is based on daily wages, which suffered because of the reduction in the number of hours worked. A second reason for this difference is that our index includes industrial as well as non-industrial wages.

⁴⁹It could be argued that the fall in the real price of capital was due to the effect of sanctions and autarky, which limited imports of equipment worsening the average quality of capital goods and leading to a fall in their price. This possibility is confirmed by a document written by Italo Locatelli, the Director of the *Associazione Nazionale fra gli Industriali Meccanici ed Affini*. Locatelli (1937) lamented how Italy imported around 40 million lire worth of equipment every year, and how these imports were particularly significant for agriculture. He also claimed that the sanctions had confirmed to industrialists and to the government that ‘the output of the Italian mechanical engineering industry is of lower quality than that of foreign producers’ (Locatelli, 1937, p. 327). Yet, despite these fears, there appears to be no evidence of the fact that sanctions had a significant impact on the quality of equipment used in Italian firms. Locatelli offers a range of examples of machines for the textile industry where Italian firms managed to close the gap with foreign competitors. The impressions by Locatelli - which may be affected by the propagandistic nature of the volume he writes in - are confirmed by the work by Toniolo (1980), who openly talks about a “noteworthy” process of import substitution going on in the production of machine tools. Interestingly, it appears that this success story was largely tied to the operations of small and medium-sized artisan workshops. Their operation prevented a deterioration in the quality of machine tools in Italian industry, which, therefore, does not explain the fall in the price of capital occurring in the interwar years.

period of the late liberal Italy.

When comparing the newly obtained results with those from Rossi and Toniolo (1992; 1993), it is clear that our estimates relative to the pre-1913 era are largely consistent with those from Rossi and Toniolo (1993), that is the only paper which uses a periodisation which is similar to the one used here. Conversely, the new estimates for the Fascist era appear much lower than all the four estimates obtained by the two scholars. Padoxically, these new results offer stronger support to the pessimist theses of Rossi and Toniolo than the one they could find in their own estimates and suggest that technical change throughout the interwar year probably occurred at a very slow rate.

As a last point, it is helpful to compare the benchmark estimates presented in Table 3.2 with estimates obtained without seeking to control for structural change. As it was explained earlier on in this Section, this can be done by letting the share of payments going to different types of workers vary over time. The results, which are not shown in the Table, show that the alternative estimates of TFPG are 1.69% for the first period and 0.28% for the second period. Not controlling for structural change in the calculations of TFPG does not, therefore, affect our main result - that there was a slowdown in the speed of total factor productivity growth between the late liberal period and the interwar years. However, a comparison between the two sets of estimates can help to better understand what was driving TFPG in the two eras. Structural change played a significant role in the pre-World War One age.

However, the pace of TFPG is very fast even when one controls for it. This means that technical progress had, arguably, a greater role in this period. Conversely, the relative importance of structural change was much greater in the interwar era. Estimates of TFPG obtained without controlling for structural change show a slightly positive rate of growth of the residual. When we control for structural change, the residual falls to zero. This results support the view that structural change did play a role in fostering economic growth during the Fascist period. It does, however, also suggest that it was not accompanied by significant technical progress.

3.6 The role of land and human capital

The baseline model described in Section 3.5 only relies on labour and capital as two inputs in production. This Section aims to build on this model to incorporate indicators for two other factors of production, land and human capital, which have been virtually ignored by the literature. Section 3.6.1 presents a model which incorporates land, while the role of human capital is investigated in Section 3.6.2.

3.6.1 The role of land

The decision to include land as a factor of production follows from the importance that the agricultural sector had in the Italian economy well into the 20th century. As shown by Cohen and Federico (2001) using data from the population censuses, the agricultural sector employed 59.1% of the Italian labour force in 1911, 52% in 1936 and 44.3% in 1951, when it was still the sector the relative majority of Italians

worked in. If one concentrates on value added rather than employment, the estimates by Rossi, Sorgato and Toniolo (1993) show how the contribution of agriculture to aggregate value added was higher than the one of industry until the 1930s.

Despite the importance of agriculture, the difficulties in measuring the exact amount of land have often led researchers to ignore it when performing growth accounting exercises⁵⁰. Furthermore, it has been argued that land is a relatively fixed factor of production and that, therefore, neglecting it should not bias estimates of the rate of change of total factor productivity (Matthews, Feinstein and Odling-Smee, 1982, p. 206). This latter statement has been successfully rebutted by Prados de la Escosura and Rosès (2009, p. 1073) who have argued that, since the amount of land is relatively fixed, by assuming that it grows at the same rate as capital one is likely to underestimate the rate of TFP growth. Furthermore, the relative fixity of land appears hard to justify in the period under consideration, as the Italian governments attempted to increase the stock of land through a range of different policies. This process was already undergone during the era before World War One when, according to Bandini (1963, p. 181), 790,000 hectares of land were drained as the government tried to control the spread of malaria and to increase the amount of land which was available for pasture (Cohen, 1973, p. 353). These policies were continued during the Fascist period, under the leadership of the Undersecretary to the Ministry of Agriculture, Arrigo Serpieri. In particular, the government launched a program of *bonifica integrale*, whose aims included the extension of the amount of arable surface. This

⁵⁰See Matthews, Feinstein and Odling-Smee (1982, p. 205) and Maddison (1987, p. 660).

decision was connected to a general policy of exploitation of marginal lands, which was part of its so-called “battle for wheat”, launched by Mussolini in July 1925. The first law in this direction dates 1924⁵¹, and it was mainly aimed at coordinating all the different draining projects under a unique plan. This plan came in the shape of the 1928 Mussolini Law⁵². This law stated that the government should spend a total of seven billion lire into the drainage of the marshes⁵³. The outcome of the campaign was the drainage of 220-225.000 hectares of land (Bandini, 1963, p. 161), a figure which, although far smaller than the 900,000 hectares stated by the regime, does not appear to be insignificant⁵⁴.

A further point which should be made is that in dual TFP calculations it is important to think in terms of payments to a factor of production rather than in terms of factor quantities. 45% of the total value added produced in agriculture in 1911 was appropriated as rent (Federico and O’Rourke, 2000), a share which was equal to 18% of national income. By ignoring the movement of land rents, one risks biasing the estimates of total factor productivity. The size of this bias can be calculated by recalling the national income accounting identity. Suppose that $Y = rK + wL + qT$, where q is land rent and T is the quantity of land. It can be easily shown that, if one incorporates payments to land into payments to capital, the measure of TFP growth would suffer from a bias equal to $s_t(\hat{r} - \hat{q})$, where s_t is the share of payments going

⁵¹R.D.L. 18th May 1924, n. 732.

⁵²R.D.L. 24th December 1928, n. 3134.

⁵³4.3 billion would be provided by the government and the remaining part by privates.

⁵⁴The policy has been hailed as a moderate success even by historians of Fascist Italy who have otherwise taken a very critical stance towards the policies pursued by the regime. See, among others, Mack Smith (1997, pp. 472-3).

to land. This bias equals zero if and only if real land rents and the real rental rate of capital rise at the same rate (or, more trivially, if the share of payments going to land is equal to zero). Were real land rents to rise at a lower rate than the real rental rate of capital, a model excluding land would overestimate TFP growth, while the opposite would obviously be true if land rents were rising faster.

For these reason, in agreement with a stream of recent historical research⁵⁵, we collected original data to include land as a separate factor of production. This was a far from trivial task: as it has been remarked, in the Italian case, there is a general absence of ‘nice long series’ (Poni, 1978, p. 803) for most variables associated with land, and, in particular, there appears to be no series for land rents for Italy covering the entire period of our study⁵⁶. The strategy I adopt to obtain such series is twofold. For the pre-World War One series, there is simply not enough material to construct a time-series which is representative of what was happening in the whole of Italy. As Galassi and Zamagni (1994) have written in their review of micro-level studies on the Italian agrarian firms between 1860 and 1914, ‘agrarian micro-historical studies between Unification and World War One are relatively few’ (Galassi and Zamagni,

⁵⁵See Crafts (1995); Antras and Voth (2003); Prados de la Escosura and Rosés (2009). More specifically to the Italian case, see Federico (2007). Bosworth and Collins (2008) also include land as an independent factor in their study of China and India.

⁵⁶An indirect confirmation of this statement comes from the work of Williamson. In his study of wage-rental ratios, land-labour ratios, the terms of trade and other variables for the greater Atlantic economy and the periphery, Williamson (2002) does not include Italy, which he had included in a similar study on the relative price of capital goods (Collins and Williamson, 2001). This is likely to be due to the absence of data on this particular variable. Furthermore, in her study of income distribution between 1919 and 1922, the lack of direct data on this particular variable obliged Zamagni (1981) to calculate land rents as a residual, by subtracting from GDP estimates of income accruing to labour and capital.

1994, p. 9) and tend to cover the period before the 1890s⁵⁷ so that the ‘the terms of the growth (or of the slowdown) of Italian agriculture before World War One [...] are still covered by large dark zones’ (Galassi and Zamagni, 1994, p. 4).

The problems associated with the limited availability of sources are to some extent compensated by the specificities of the historical period, one in which historical contingencies particular to any one country tended to matter less than in the interwar years. In fact, although each country experienced a variety of idiosyncratic shocks, they were also all subject to the strong trends of increasing globalisation, which have been studied in a wide and well-documented literature⁵⁸. Within this literature, a study which is of particular interest is the fore-mentioned one by Williamson (2002), looking at the evolution of wage-rental ratios, land-labour ratios and the terms of trade for the greater Atlantic economy and the periphery over the 1870-1940 period. In this paper, Williamson divides the countries under study in three categories, namely land-abundant overseas settlements, land-scarce European countries that stuck to free trade and land-scarce European countries that raised tariffs to help fend off the winds of competition, a group in which he includes Spain, France and Germany.

There is abundant evidence in the literature⁵⁹ that in the era between 1890 and

⁵⁷It is strange to note how many of the studies which follow individual firms throughout the dark years of falling prices cease around the mid-1890s’ (Galassi and Zamagni, 1994, p. 12).

⁵⁸This is largely associated with the work of Kevin O’Rourke, Alan Taylor and Jeffrey Williamson. For a review, see Williamson (1996), O’Rourke, Taylor and Williamson (1996) or O’Rourke and Williamson (1999).

⁵⁹For a review, see Fenoaltea (2006).

1913, Italy pursued a protectionist policy, at least for what concerned the agricultural sector⁶⁰. This means that the evolution of real rents in Italy is likely to have matched that of the fore-mentioned protectionist, land-scarce countries for which rents data are available. To choose which countries should best mirror Italy, we investigate how the level of protection of agricultural products in these three countries compared to the Italian one. This evidence is far from being abundant. Until the late 1990s, the only study which had looked at the different duties of identical commodities was the work by Grunzel (1916). He found that, for the case of wheat - the only agricultural product included in his study - the level of protection in Italy was lower than the one present in Germany, but roughly similar to the one present in Spain and France⁶¹. In the late 1990s, a study by Estevadeordal (1997) complemented this evidence by calculating a range of more complex indicators which could go beyond this single product and also address some of the methodological problems with Grunzel's measure⁶². In particular, he estimated the trade intensity ratio, the adjusted trade intensity ratio and an openness index for a sectoral aggregate of "agricultural products" relative to 1913. In all cases, the level of protection enjoyed by Italy was similar to the one of Spain and France, with Germany displaying a different pattern, which, according to these broader indicators was one of lower protectionism⁶³. This

⁶⁰Federico and Tena (1998) have recently questioned this proposition at the aggregate level, but not specifically for the agricultural sector.

⁶¹Grunzel (1916) found that the level of protection was \$0.72 per 100 pounds in Italy, \$0.67 in France, \$0.76 in Spain and \$6.47 in Germany.

⁶²For a thorough review of these issues, see Estevadeordal, 1997, pp. 90-3

⁶³Italy's trade intensity ratio was equal to 4.75, with Spain's being 5.40, France's 7.63 and Germany's 10.63. In the case of the adjusted trade intensity ratio, Italy's index (-3.22) was intermediate between Spain's (-3.74) and France's (-2.21), with Germany's being significantly higher (0.61). A similar pattern is also found when an openness measure is calculated (Italy's one is 5.96, Spain's one is 5.91, France's is 7.75 and Germany's 10.61). For more details on how these

evidence shows that, of the three countries for which Williamson (2002) has collected data, Spain and France appear to be the best proxies for Italy. For this reason, for the period between 1890 and 1913, we proxy real land rents in Italy over the period as the *average*⁶⁴ of real land rents in France and Spain⁶⁵.

The strategy outlined here cannot be easily applied to the interwar years. Here, idiosyncratic shocks of much greater magnitude⁶⁶ affected the two countries and relying on their time series as a proxy for Italy would seem completely out of place. Furthermore, differently from the pre-World War One period, there exist a larger range of micro-level studies one can draw from to construct a new series for this particular variable. This is largely thanks to the decision by Arrigo Serpieri to create, on 30th December 1923, the *Istituto di economia e statistica agraria* (INEA), whose aim was to collect agricultural statistics and to promote research on agrarian firms. Among the studies conducted by the institute, the most relevant ones for this study are seven surveys of agrarian firms conducted by Giuseppe Tassinari and Dario

indices are calculated, see Estevadeordal (1997, pp. 103-6).

⁶⁴Averaging out the two data sources is a way of limiting the impact of the idiosyncratic shocks affecting the variable in each one of the two countries. This is also why we prefer to combine data from two countries rather than relying on Spanish data alone, arguably the country with the most similar tariff structure to Italy (Estervadeordal, 1997, pp. 109-13). For a more detailed study, see Tena Junguito (2010).

⁶⁵The price level in the two countries is taken from the dataset used by Obstfeld and Taylor (1998). I prefer to deflate the two series by their own country-specific price index, as this avoids the problems related to country-specific idiosyncrasies in inflation. As a practical matter, this choice is not particularly significant. If I chose to deflate the two series by the Italian price index to maintain consistency throughout the exercise, the average annual percentage change in real rents over the 1890-1913 period would be only be 0.07% lower. The resulting difference in TFP growth rates would be in the region of 0.01%.

⁶⁶To only quote a few examples, the Civil War in Spain, or hyperinflation in France.

Perini over the period between 1926 and 1938⁶⁷ and referring to the years between 1921 and 1936⁶⁸. This allows to collect data relative to the entire period between 1923 and 1936⁶⁹.

The advantage of these new sources is triple. The first one is that the information presented is largely made of repeated observations on the same agrarian firms, allowing comparability over time. This is an advantage which was acknowledged by the scholars whose work we rely on⁷⁰. In order to maintain this comparability, I prefer to only use data from those firms which were sampled repeatedly. The main problem is that, unfortunately, it is impossible to construct a series which is only made of observations on the same firms throughout the entire 1923-1939 period. The continuity can be guaranteed over three sub-periods, namely 1923-5, 1925-1932 and 1933-6, while the sample changes when moving from one sub-period to the other⁷¹.

This problem is, anyway, minimised by the second advantage of these sources,

⁶⁷See Tassinari (1926); Tassinari (1931); Perini (1932); Tassinari (1935); Perini (1935); Perini (1937); Perini (1938).

⁶⁸Galassi and Zamagni (1994) also agree on the importance of these sources: ‘The *Risultati economici di aziende agrarie* are, perhaps the most interesting pieces of research among those produced by the *Istituto* for a history of agrarian institutions’ (Galassi and Zamagni, 1994, p. 13).

⁶⁹As the publication stops with data relative to 1936, it is impossible to extend the series to 1939. A possibility would be to extrapolate it to 1939 using a different series, but no alternative series (e.g. value added in agriculture) appears to closely match the behaviour of this particular dataset over the 1923-1936 period. Hence, it is deemed preferable to assume that the series for the period 1923-1936 is representative of what occurs over the whole 1923-1939 period.

⁷⁰‘To be able to follow the happy and sad repercussions of the economic cycle on the same representative agrarian firm is undoubtedly interesting’ (Tassinari, 1935, p. 9).

⁷¹This is potentially problematic: however, it is possible to use a publication by Perini (1935) to extend the 1933-6 sample backwards and therefore see if the behaviour of the two series over the years 1931-2 is significantly different. This does not appear to be too large, reassuring us that this problem is not too serious.

namely the fact that the researchers made a special effort to survey agrarian firms which were representative of what was happening in the whole of Italian agriculture. This is particularly important, as the problem of representativeness of the surveyed sample has long tainted the agricultural history of Italy⁷². The sample hereby used addresses it in two ways. Firstly, it must be said that, when choosing which agrarian firms to survey, Tassinari and Perini seemed to be aware of the problem and put effort in choosing representative ones⁷³. Secondly, their surveys were large enough that they allow us to rely on a relatively large sample, at least for what concerns the period 1925-1936⁷⁴. Table 3.3 shows the total number of firms surveyed in the publications and the number of firms which are employed in the construction of the series, together with the number of Italian regions which can be covered thanks to the source. The regional distribution of the number of firms included in the sample is also shown in Figure 3.1. As it is clear from these Table and Figure, the sample presented in each one of the studies is sufficiently large, allowing us to use information on around 40 agrarian firms over the period between 1925 and 1936. The regional coverage is also rather good, as it limits the well-known problem in Italian agricultural history of over-reliance on information coming from Tuscany and Emilia Romagna, two regions where the type of contract enforced (*mezzadria*) obliged the

⁷²For a thorough discussion of this issue, see Galassi and Zamagni (1994, pp. 5-9).

⁷³The choice of which agrarian firm to sample followed a long, meditated choice of the different agrarian structures, so that we could choose which ones best represented the *average type* (Tassinari, 1931, p. 23); 'similarly to what was done in the surveys by Tassinari, our researches were aimed at identifying *normal* agrarian firms, which were chosen after a preliminary examination of their environment' (Perini, 1932, p. 4).

⁷⁴Unfortunately, for the period between 1921 and 1925 we can only rely on three agrarian firms. This is regrettable, but we can at least rely on the judgement of Tassinari who explicitly says that these three types of agrarian firms 'can be taken as the three most widespread agrarian systems in Italy' (Tassinari, 1926, p. 281).

	Source	N°of agrarian firms surveyed	N°of agrarian firms used in this study	N°of regions covered
1925-32	<i>Tassinari (1935)</i>	65	40	10
1933-5	<i>Perini (1937)</i>	94	35	7
1936	<i>Perini (1938)</i>	109	35	7

Table 3.3: Characteristics of the sample of agrarian firms

Sources: *Tassinari (1935)*; *Perini (1937, 1938)*

farmers to keep a detailed record of the performance of the firm (Galassi and Zamagni, 1994, p. 7).

The third advantage of the sources is the wealth of data thereby included. The sources contain information on a range of variables, including the value of the land (price per hectare) and land income, which includes both *land rent* and *profit*. In theory, the data on land income would be the closest to the data we need, that is land rents. However, this particular variable is calculated as a residual and is, therefore, extremely volatile. For this reason, it is deemed preferable to rely on the data on the price of land⁷⁵ and calculate the growth rate of the real rental rate of land in the same way as we calculated the growth rate of the real rental rate of capital⁷⁶

⁷⁵Unfortunately, the data do not refer to the price of ‘unimproved land’, which would be the relevant one for this study, but to the price of land, which includes improvements which are a capital input. This is a problem which is common to most studies of this sort (see Prados de la Escosura and Rosés, 2009, pp. 1072-3) and which cannot be corrected with the data sources I have.

⁷⁶This means dividing the point estimate of the time trend of the sum of the interest rate and the

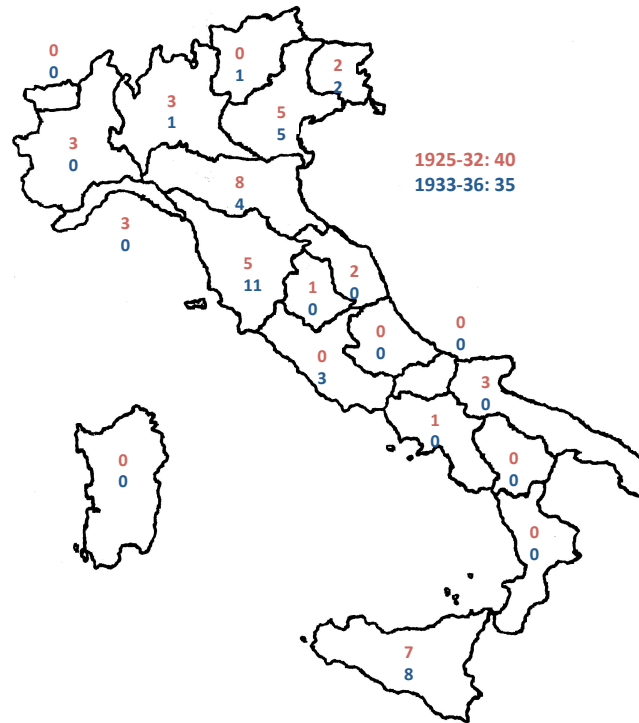


Figure 3.1: Regional location of the sample of agrarian firms
Sources: Tassinari (1935); Perini (1937; 1938)

Figure 3.2 presents the new series for the annual changes in the real rental rate of land over the period. The results appear consistent with the existing literature and largely reflects the thoughts expressed by Tassinari and Perini in their own work. The very early 1920s are characterised by fast rising rents, reflecting the large increase in agricultural production of those years emphasised, among others by Toniolo (1980)⁷⁷.

depreciation rate by its average value and adding this to the average growth rate of the relative price of land. The data used for the interest rate are the same as those used to calculate the real rental rate of capital. Differently from the calculation of the rental rate of capital, a zero depreciation rate is assumed.

⁷⁷Analysing the ISTAT-Fuà data, Toniolo underlines how 'the average annual growth of production over the 1922-5 period was equal to 3.6%' (Toniolo, 1980, p. 304).

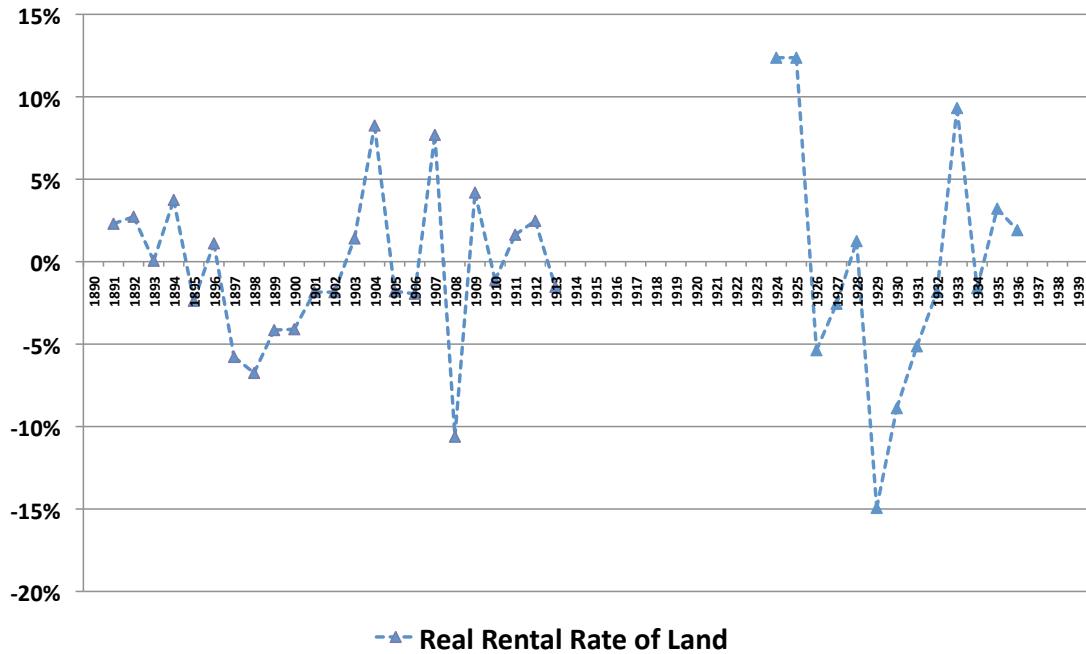


Figure 3.2: Changes in the real rental rate of land, 1890-1939 (in %, per annum)
Sources: see text.

This is followed by some particularly bad years, culminating in the Depression. In those, years, the fall in the value of agricultural production, which was largely driven by the fall in the relative prices of agricultural goods, had a negative effect on the price of land (Perini, 1932, pp. xx-xxi). Positive rates of growth of real rents only occurred with some consistency after 1934, reflecting the view expressed by Toniolo that agriculture fully recovered from the recession only around that year⁷⁸. More generally, the overall trend of the data fits well with the overall picture presented by Corner (1975), who has talked of a largely stagnating agricultural sector over the in-

⁷⁸In the recovery after 1934, the primary sector started to grow again: over the 1935-7 period, its growth rate was roughly equal to that realised in the previous boom (1922-1925)' (Toniolo, 1980, p. 304).

terwar era. Using these new data, one can proceed to calculate alternative estimates of TFP growth for Italy for the period. This is done using a three-factor model, in which the weights assigned to real wages, real rental rate of capital and real land rents are, respectively 0.54, 0.26 and 0.2⁷⁹. Unsurprisingly, these are different from those calculated for Britain⁸⁰ and are also different from those obtained by Prados de la Escosura and Rosés (2009) for Spain over the 1850-1950 period⁸¹.

The results displayed in Table 3.4 present the new estimates, including land, as our preferred estimates, and compare them with the benchmark model obtained excluding land and with the unadjusted estimates taken from Rossi and Toniolo (1992; 1993). These results show that properly accounting for what is happening to land rents does not significantly affect the conclusion that there was a significant slowdown in TFP growth between the pre-World War One era and the interwar years. The main difference between our preferred estimates and those obtained in Section 3.5 is that, when including land, the rate of TFP growth over the late liberal era falls by around 0.4 percentage points. This figure is significantly lower than the one obtained in Rossi and Toniolo (1993). This result is largely due to the fact that, while the rental rate of capital was rising throughout the period, land rents fell because of the effects of globalisation in factor and product markets which are well documented in Williamson (2002). Properly accounting for land, therefore, reduces the weighted average of factor prices, which did not rise as much as it appeared by

⁷⁹Once again, this follows the work by Federico and O'Rourke (2000).

⁸⁰Recall that, in the British case, Matthews, Feinstein and Odling-Smee (1982) calculate for the pre-World War One economy shares equal to 0.57 for capital and 0.43 for labour.

⁸¹These shares are equal to 0.241 for capital, 0.075 for land and 0.684 for labour.

	$\hat{w}$	$\hat{r}$	$\hat{q}$	$\hat{TFP}$
Preferred Estimates				
1890-1913	1.80	1.12	-0.45	1.17
1923-1939	0.90	-1.09	-0.90	0.02
Benchmark Estimates I				
1890-1913	1.80	1.12	-	1.49
1923-1939	0.90	-1.09	-	-0.02
Rossi and Toniolo (1992 - Primal)				
1895-1905				1.6
1905-1925				1.0
1925-1939				1.4
Rossi and Toniolo (1992 - Dual)				
1895-1905				0.8
1905-1925				0.2
1925-1939				1.8
Rossi and Toniolo (1993 - Primal)				
1893-1914				1.69
1919-1939				0.67
Rossi and Toniolo (1993 - Dual)				
1893-1914				2.64
1919-1939				2.85

Table 3.4: Estimates of TFP growth for Italy (2), 1890-1939 (in %, per annum)
Sources: see text

ignoring land. Despite this revision, the gap between the performance of TFP in the period of the late liberal Italy and the one occurring during the Fascist era remains large, confirming the overall slowdown in the variable occurring in the interwar era

which we had already found in Section 3.5. In fact, it is interesting to notice how the effect of introducing land rents in the Fascist era is almost negligible. This result would seem to confirm the view that the *bonifica integrale* had a very negligible effect on the Italian economy of the period⁸².

As a last point, it should be added that these results are robust to changes in the factor shares. A possible alternative is to use as shares those estimated by Prados de la Escosura and Rosés (2009) for Spain over the 1850-1950 period. When one re-estimates our favourite model, one obtains a slight improvement in the average annual rate of TFP growth during the Fascist period, which rises to 0.29%. However, these figures are still well below those of the previous era. Using the same shares as Prados de la Escosura and Rosés (2009), TFP growth in the pre-World War one era would, in fact, be equal to 1.46%, a figure which is very similar to the one obtained in the estimates we obtained when ignoring the role of land.

3.6.2 Accounting for human capital

The estimates of TFP growth presented in Sections 3.5 and 3.6.1 are obtained netting out the effect of structural change from the returns to labour. However, they do not control for the impact of changing skills. A rising proportion of unskilled workers in the workforce would exert downward pressure on wages as measured by real wage indices. The opposite would be true of an increase in the proportion of skilled workers,

⁸²See Corner (1976) and, in particular, Cohen (1973, p. 366): ‘Despite the publicity accompanying the draining of the marshes, projects proceeded slowly and, as the data indicate, the amount of new lands which could be cultivated was small. The program was largely slowed by the inadequacy of its funding [...] and by Mussolini’s reluctance in obliging landowners to obey the law’.

which would ultimately lead to an overestimation of TFP growth. According to much of the existing literature, this issue should not apply to the Italian experience of the time. To only quote one example, Vasta (1999, p. 1045) has argued that ‘despite the large amount of attention devoted to it by the political world, the Italian educational system has not undergone throughout the years too dramatic changes’. Yet, a careful re-examination of the historical record shows that human capital accumulation did differ between the liberal age and the Fascist age. In particular, there is evidence that the provision of human capital slowly improved throughout the liberal age, a process which was halted - if not plainly reversed - during the Fascist era.

These trends appear slightly less visible in the case of primary education. The latest figures by A’Hearn, Auria and Vecchi (2011) show that literacy grew slowly throughout the 1861-1913 period. The failures of the Casati Law⁸³ were only partly addressed by the 1877 Coppino Law⁸⁴ and the 1904 Orlando Law⁸⁵, which raised the number of years of compulsory education - respectively - to three and six. It was only when the 1911 Daneo-Credaro Law transferred the management of primary education to the state⁸⁶ that there was a significant improvement in both literacy and enrollment rates (A’Hearn, Auria and Vecchi, 2011). This seeming failure of

⁸³R.D.L. 13th November 1859, n. 3725. This was the ‘*Magna Charta*’ of the Italian school system (Borghi, 1951, p. 91). It disposed that all students were to be provided with two years of compulsory and free education. However, the lion’s share of the cost of the system had to be born by the local communities, some of which lacked the resources to provide any education at all to the local children (Koon, 1985, p. 35).

⁸⁴R.D.L. 15th July 1877, n. 3961.

⁸⁵R.D.L. 8th July 1904, n. 407.

⁸⁶This was accompanied by an increase in the resources devoted to education. As shown in Zamagni (1993b, p. 21), public expenditure in education trebled in nominal terms between 1899 and 1912.

liberal Italy, however, appears a moderate success compared to what occurred under the Fascist regime. Data from Zamagni (1993a, p. 305) show that, between 1921 and 1926 enrollment in primary education fell from 87% to 73%⁸⁷. This was largely due to the Gentile reform⁸⁸, whose primary aim was to reduce the amount of students going into secondary schools, which Gentile saw as overpopulated⁸⁹. To do so, Gentile created the *scuola complementare*, a junior high school which would not lead to further education and which effectively encouraged parents to withdraw their children from school. The abolition of these schools in 1929, provided for by the counter-reform by Giuseppe Belluzzo, helped to resume the growth of both literacy and enrollment indicators, which, however, remained well below the corresponding ones in other developed countries (A'Hearn, Auria and Vecchi, 2011).

The difference between the late liberal era and the Fascist age appears more pronounced when one looks at secondary education⁹⁰, and, in particular, at the provision of technical skills. In the pre-World War One era, a key role in this process was played by “technical schools”⁹¹ and by the *scuole d’arti e mestieri*, which pro-

⁸⁷A drop is also visible in A'Hearn, Auria and Vecchi's (2011) indicator.

⁸⁸R.D.L. 31st December 1922, n. 1679; R.D.L. 16th July 1923, n. 1753; R.D.L. 6 May 1923, n. 1054; R.D.L. 30th September 1923, n. 2102; R.D.L. 1st October 1923, n. 2185.

⁸⁹It also provided for obligatory school attendance until the age of fourteen, ‘but this goal remained more a hope than a reality’ (Koon, 1985, p. 49).

⁹⁰It should be emphasised that enrollment rates in secondary and higher education remained low throughout the period. Zamagni (1993a, p. 305) has calculated that, in 1936, the enrollment rate in secondary and higher educations were, respectively, as low as 10.9% and 2%, barely twice as high as the level reached ten years before.

⁹¹To be more precise with the taxonomy, the *scuole tecniche* were the lower level of technical education, which could then be continued in the *istituti tecnici*. These were introduced in the Casati Law alongside the humanity-focussed *ginnasio-liceo*. While the latter was the privileged route to access University, the former would provide a well-rounded education together with a range of more school-specific vocational subjects.

vided vocational training which was largely tailored for local needs. Their impact on technical education was far from insignificant. Between 1862 and 1914, the students of the *scuole tecniche* and *istituti tecnici* increased by a factor of fourteen, and, as of 1881, the growth of the *scuole d'arti e mestieri* also accelerated (Zamagni, 1978b, p. 152). Although Vasta (1999, p. 1061) has argued that most of this boom was concentrated among the lower level *scuole tecniche*, rather than in the higher level *istituti tecnici*, and that the former only taught basic skills which 'could not respond to the needs of technical change', this argument does not appear entirely true. The number of students enrolled in the *istituti tecnici* as a proportion of students enrolled in secondary education, in fact, rose from 18% in 1862 to 34% in 1911 (Zamagni, 1993b, p. 34), proving that a growing share of students undergoing secondary education was, in fact, undergoing more advanced technical training. This process, which Zamagni (1993a) has seen as a key factor in the process of industrialisation Italy underwent in the pre-World War One era, came to a halt with the Gentile reform of the Fascist period. The abolition of "technical schools" and their replacement with the *scuole complementari* led to a fast reduction in the enrollment rates and to a quick decline in the spread of technical education in the country. The counter-reform by Giuseppe Belluzzo made the new technical schools better than the old *scuole complementari*, but the damage had been done. The new schools, in fact, remained 'dumping grounds' (Ambrosoli, 1990, p.130), much as the old creation by Gentile.

That technical education was promoted in the late liberal Italy more than during

the Fascist era is confirmed by what occurred to higher education. Although universities remained mostly dominated by humanities throughout the period, it appears useful to analyse the trends in the proportion of students enrolled in engineering and scientific degrees. Vasta (1999, p. 1066) shows how the proportion of students in higher education doing sciences or engineering rose, between 1891 and 1911, from 17.2% to 24.8%, with the share of students enrolled in engineering degrees increasing from 14.1% to 20% of the total. This trend was reversed during the interwar era: between 1921 and 1941, the former indicator fell from 31.7% to 18.3%, while the latter shrank from 23% to well below the 1891 levels, that is 5.1%. Even accounting for the role played by World War One in increasing the demand for engineering skills (Vasta, 1999, p. 1067), these numbers appear very striking and confirm the presence of a discontinuity in the provision of human capital between the two eras under consideration.

In light of such changes, it appears advisable to control for human capital formation when calculating our estimates of total factor productivity growth. The most appropriate way of doing so would be to calculate separate wage series for each skill category (Hsieh, 2002, p. 506). However, as it was underlined by Federico and O'Rourke, for the Italian case over the period of this study, there is not enough information to perform this exercise⁹². This important limitation can, however, be circumvented. This is done using a combination of existing and newly compiled data from the construction sector to gain some useful understanding of what was

⁹²'There are no data on the proportion of skilled workers in the total workforce or on the skill premium' (Federico and O'Rourke, 2000, p. 22).

happening to the returns to skilled and unskilled labour over the period 1890-1939. Although these figures will suffer from some limitations, they can help us to understand the likely direction and size of the bias introduced in our baseline estimates of TFP growth. In order to account for these changes, the national accounting identity is revised as follows

$$Y_t = r_t K_t + u_t R_t + q_t T_t + z_t H_t \quad (3.10)$$

Equation 3.10 includes four factors of production. Together with capital and land, there are now two different factors of production, R , which only represents "raw labour", and H , which stands for the stock of human capital in the population. In this scenario, u is the real return to raw labour, while z is the real return to human capital. The corresponding dual estimates of TFP growth can, therefore, be calculated as follows

$$TF\hat{P}_{dual} = \alpha \hat{r} + \beta \hat{u}_t + \gamma \hat{q}_t + \omega \hat{z} \quad (3.11)$$

To estimate this model, we, once again, take the relevant factor shares from Federico and O'Rourke (2000). The returns to capital (r) and to land (q) are obtained in the same fashion as for our previous models. Conversely, the returns to raw labour and human capital are obtained using information on a particular sector of the economy, namely the construction industry. The data employed in this section, which are described at length in Appendix 3.B, include information on the wages of *muratori* (masons) and *manovali* (labourers). The wage series relative to *manovali* is used to

proxy the returns to raw labour, while the difference between wage of *muratori* and that of *manovali* is used as the proxy for the returns to human capital⁹³. Both series are deflated using the GDP deflator.

The data used here have two advantages. The first one is their wide availability, which allows to construct a time series covering the entire period under consideration. This consideration rules out alternative measures, such as data on the level of education of the workforce, which is simply not available at a disaggregated enough level. Their second advantage is that they allow to insulate the trends we identify from sectoral shocks. A possible alternative would, in fact, have been to concentrate on manual and non-manual wages, using as the relevant series the returns to labour in construction and the one of clerical workers. Yet, this alternative indicator would have been affected by changes in the sectoral structure of the economy. To only give an example, the construction boom characterising the late 1890s and leading to a generalised increase in the wage of construction workers would have caused a spurious reduction in the returns to human capital.

Clearly, the type of evidence used here has three important limitations. Firstly, the process of human capital formation in the construction sector did not depend on the formal education sector, but on on-the-job training. This means that the data

⁹³Measuring the returns to human capital as the earnings in excess of the wage earned by the common labourer is a technique widely used in data-scarce historical studies. Williamson (1985, p. 99) offers a thorough discussion of this assumption. The way in which Crafts (1995, p. 752) obtains the factor share relative to human capital in his study of TFP growth in the British economy between 1760 and 1913 is also based on this assumption, and so are the calculations by Federico and O'Rourke (2000).

here-by used may not adequately depict the trends described in the previous section. Secondly, differentials based on standard rates may be a worse guide to market-clearing differentials than, say, differentials based on actual earnings. Thirdly, differentials based on one sector and a few occupations may not be representative of the workforce as a whole. Yet, the work by Anderson (1998, 2001) has shown that for a group of eight now-developed countries over the period 1870-1970, differentials based on official wage rates track closely differentials based on actual earnings and that the trends of the differentials were similar across sectors. His conclusions reassure us that the conclusions we obtain from our data can offer some meaningful guidance for what was occurring in the economy as a whole.

Table 3.5 shows the effects of accounting for human capital in this growth accounting exercise. The benchmark estimates "II" and "III" are obtained including "raw labour" and "human capital" as two separate factors of production. While the former model only includes capital as an additional factor of production, the latter also has land. Although these figures are not directly comparable to the other two models as the series for the returns to labour now changes, they provide us with a good platform to interpret what was occurring to skills in the two periods we consider.

The first observation to make is that the returns to skills (z) were practically stagnant throughout the age of liberal Italy, while they rose steadily throughout Fascism. This finding is broadly consistent with the one obtained by Betrán and Pons (2004)

	$\hat{w}$	$\hat{r}$	$\hat{q}$	$\hat{u}$	$\hat{z}$	$\hat{\text{TFP}}$
Preferred Estimates						
1890-1913	1.80	1.12	-0.45	-	-	1.17
1923-1939	0.90	-1.09	-0.90	-	-	0.02
Benchmark Estimates I						
1890-1913	1.80	1.12	-	-	-	1.49
1923-1939	- 0.90	-1.09	-	-	-	-0.02
Benchmark Estimates II						
1890-1913	-	1.12	-	1.46	0.09	1.06
1923-1939	-	-1.09	-	1.02	1.06	0.06
Benchmark Estimates III						
1890-1913	-	1.12	-0.45	1.46	0.09	0.74
1923-1939	-	-1.09	-0.90	1.02	1.06	0.09

Table 3.5: Estimates of TFP growth for Italy (3), 1890-1939 (in %, per annum)
Sources: see text

in their study of the skill ratio in five countries⁹⁴. It could be argued that these trends have nothing to do with changes in the provision of human capital and can be explained within the framework of increasing globalisation which characterised the late 19th century and of increasing protectionism characterising the interwar years.

⁹⁴In their paper, Betrán and Pons (2004) find that the Italian skill premium, which they define as the ratio of skilled to unskilled wages, fell between 1880 and 1914, while it rose between 1914 and 1930. The difference between results is due to the fact that the indicators used in the two papers are different. In this paper, in fact, we use the real difference of the wages of skilled and unskilled workers $\left(\frac{(w_s - w_u)}{p}\right)$. Conversely, Betrán and Pons employ the nominal skill ratio $\left(\frac{w_s}{w_u}\right)$, an indicator which falls every time unskilled wages rise faster or decrease more slowly than skilled wages. Vecchi and Del Papa (2003) calculate the same indicator as Betrán and Pons using the same data that we use in our calculations and find evidence of a falling skill ratio between 1880 and 1913. This confirms that the difference in the results is only due to the different methodology employed.

As argued by O'Rourke and Williamson (1999), during the pre-World War One era the integration of commodity markets and trade growth increased the demand for unskilled labour in countries where this was relatively abundant, and reduced it where it was relatively scarce. Mass migration from the Old World to the New World reduced the supply of unskilled labour in labour-abundant countries and increased it in the New World. The result was an overall decrease in inequality in the Old World and an increase in the New World⁹⁵. As the integration of factor markets diminished following the backlash against globalisation occurring in the interwar years, inequality fell in the New World to rise again in the Old World⁹⁶.

Yet, the study by Betrán and Pons (2004) confirms that there was more at play than globalisation only and that the technological change occurring during the second industrial revolution also played a role. Although, in principle, the technologies of the second industrial revolution could have displaced both skilled and unskilled workers (Harley, 1974, p. 394), recent studies have shown that the introduction of continuous-processes and batch methods in production and electrification since the first half of the 20th century have led to the emergence of the technology-skill complementarity which is still present in the contemporary world (Goldin and Katz, 2008). This hypothesis finds support in the empirical analysis by Betrán and Pons, who show that technological change at the time was largely skill-biased and, together with structural change, can explain over 50% of the rate of growth of the skill pre-

⁹⁵This result is obtained in research by Williamson (1996), Hatton and Williamson (1998) and O'Rourke and Williamson (1999).

⁹⁶The pre-World War One trends are confirmed in the forementioned study by Anderson (2001), who, however, does not find a reversal of the effect occurring in the interwar era.

mium. The two scholars also claim that, in the Italian case, skill-biased technological change was a particularly strong explanatory variable for changes in the skill premium.

These results are nicely explained by the trends in human capital formation we have outlined in the previous part of this Subsection. As outlined by Federico (1996, p. 772), during the pre-World War One era, Italy saw fast growth in its light industries, which became competitive in the world market as of 1890s. Technology was comparatively labour intensive and did not need skilled workers. The slow growing demand for skills was matched by a sufficiently adequate improvement in the skill-set of the population, due to the improvements in technical education. This led to an overall equilibrium in the demand and supply of skills which is confirmed by the stability of the skill premium. This process no longer occurred in the interwar era. In this period, electrification and the introduction of new production processes introduced with the second industrial revolution implied a rise in the demand for skills. However, as we have argued in the previous part of this Section, the process of human capital formation was inadequate for the demands of a transforming economy. The rise in the returns to human capital identified in Table 3.5 is the effect of an overall imbalance between demand and supply of skills which characterised the Fascist economy.

These movements are helpful in explaining the rate of growth of TFP, which we also observe in Table 3.5. When accounting for human capital, the rate of TFP

growth for the 1890-1913 period is reduced, while it remains unchanged for the interwar years. This can be explained with reference to the role of skills and human capital. In the earlier period, our preferred model might have overestimated TFP growth as it ignored the improvements in human capital which characterised the Italian population. The higher wages earned by Italian workers were partly due to the improvement in their skill-set and not to generalised technical change as captured by total factor productivity. This was not true of the interwar era. In this period, human capital formation was limited and wages did not rise as a result of improvements in the skill set. The TFP measure obtained in our preferred model relatively to the Fascist era does not appear to suffer from upward biases due to human capital accumulation.

Even accounting for the role played by human capital, Table 3.5 confirms that there was a substantial slowdown in total factor productivity growth between the two periods under consideration. All models show significant differences between the estimates referring to the period of the late liberal Italy and those referring to the period of Fascist Italy. The results of the analysis so far conducted show that Italy experienced a true ‘climacteric’ in terms of TFP growth in the interwar era, with TFP growth slowing down substantially if compared to the previous period.

3.7 International comparisons

It could be argued that the low productivity performance experienced by Italy in the interwar years was not attributable to the Fascist regime's economic policy, but was a consequence of the wider negative trends affecting the whole of the world economy. Since all economies were affected by these woes, any critique of Italy's economic performance can be made more convincing by showing that the country performed poorly not just in absolute terms or compared to contiguous epochs, but also relative to other industrialised countries. For this reason, this section compares the newly obtained estimates of TFP growth in Italy with estimates obtained for Britain and Germany. The two countries were chosen as they represent the two extremes in the productivity race of the late 19th and early 20th century, with Germany doing much better than Britain. For this reason, they can offer two interesting comparative benchmarks to assess exactly how bad TFP growth in Italy was. The choice of the German economy is further justified by the apparent similarities between the policies in place in the two countries. Although a full scale comparison of the two economies is beyond the scope of this paper, it is fair to say that both countries attempted to shift resources towards the newer sector of industry, in order to build a "military-industrial" complex - a trend which became particularly clear after 1935⁹⁷. Unfortunately, since the technique employed in this paper requires a sufficiently large number of data-points, it is impossible to extract meaningful information from a comparison which only looks at the 1935-9 period. This is why we

⁹⁷For a detailed comparison of the economic policies pursued by the two regimes, see Toniolo (1980) and De Grand (1995).

rely on a longer time-span.

In order to maintain comparability, all estimates have been obtained employing the dual technique by Hsieh (2003) and are, therefore, subject to the same set of assumptions as those constructed for Italy⁹⁸. Section 3.7.1 offers a brief account of the existing evidence on the evolution of total factor productivity in the two countries, while Section 3.7.2 presents the new estimates for Germany and Britain, comparing them with those obtained for Italy in earlier sections of this paper.

3.7.1 The Anglo-German productivity race

The Anglo-German productivity race has captured much of the attention of scholars interested in productivity growth in Europe between the late 19th century and World War Two⁹⁹. This is partly due to the large availability of data, but also to the fact that, over this period, Britain and Germany were, in a sense, the mirror image of each other. Germany, together with the United States, has, in fact, been seen as the success stories of the second industrial revolution, while Britain has been seen as its failure¹⁰⁰.

⁹⁸The details of how the estimates for the other two other countries were obtained is provided in Appendix 3.A.

⁹⁹There have been some notable exceptions. See, among others, the comparative works by Wolff (1991), Enflo and Baten (2007), Madsen (2007), Carreras and Josephson (2010) and Allen (2011).

¹⁰⁰This view, held, among others, by Gerschenkron (1962) and Landes (1969), may explain why much of the literature has focussed on the comparative performance of the manufacturing sector. Notable exceptions are the contributions by Broadberry (1997; 1998; 2004), who has looked at the role played by agriculture and services, emphasising the importance of structural change and of the tertiary sector in explaining the convergence in productivity levels occurring between the two countries.

	Output	Income	Expenditure	Compromise	Balanced
1889-1899	0.5	0.9	0.9	0.8	0.8
1899-1907	0.2	-0.3	-0.6	-0.3	-0.1
1907-1913	0.5	0.2	0.6	0.4	0.5
1924-1929	0.9	1.7	0.9	1.2	1.0
1929-1937	0.8	0.5	0.3	0.6	0.6

Table 3.6: TFP growth estimates for Britain, 1889-1937 (in %, per annum)
Source: Crafts (2004)

Table 3.6, taken from Crafts (2004), presents different primal estimates of TFP growth for Britain, obtained using a range of different GDP estimates. Most of the figures come from the work by Matthews, Feinstein and Odling-Smee (1982)¹⁰¹, while the “balanced” estimates come from Solomou and Weale (1991), who preferred to weight the different results according to their reliability¹⁰². These figures present the well-known U-shaped growth trajectory of TFP growth which seemingly characterised the British economy between the end of the 19th century and the inter-war years. This pattern was composed of two different phases. The first phase, which represents the descending phase of the trajectory, occurred between the end of the 19th century and 1913. This is the so-called “climacteric”¹⁰³, which has been as-

¹⁰¹TFP is calculated using GDP data as obtained from the output, the income and the expenditure side. The compromise measure is calculated by taking a geometric mean of the expenditure, income and output measures.

¹⁰²In all cases, Crafts (2004) assumes that factor shares for capital and labour were equal to 0.43 and 0.57 for the period before 1913, and 0.3 and 0.7 for the period afterwards.

¹⁰³‘A sharp reduction in trend growth and a cessation of TFP growth’ (Crafts, 2004).

sociated with the decline of steam as a General Purpose Technology¹⁰⁴. Although the presence of a “climacteric” has been widely questioned¹⁰⁵ no new evidence has replaced the one presented in Table 3.6.

As for the second, ascending phase, this occurred in the interwar years. For Matthews, Feinstein and Odling-Smee (1982), this recovery was associated to a range of innovations¹⁰⁶, transforming TFP in one of the main drivers of output growth in the period. This optimistic view over the British performance in the interwar has also been widely criticised. In particular, Matthews, Feinstein and Odling-Smee’s enthusiasm appears less justified when one looks at Britain’s performance in comparative fashion¹⁰⁷. This is evident when reviewing the much scantier evidence on TFP growth for Germany¹⁰⁸, a country for which the substantial contribution of TFP growth to

¹⁰⁴‘The check to the rise in real income in the UK at the end of the 19th century is that the previous rise had been carried forward by the massive application of steam and steel which had not much scope for extension; while the new techniques, especially of electricity, the internal combustion engine, and the new chemical process did not attain massive application until during and after the First World War’ (Phelps-Brown and Handfield-Jones, 1952, p. 283).

¹⁰⁵Greasley (1986) has expressed doubts over the quality of the national income estimates. Crafts, Leybourne and Mills (1989) have questioned the choice by Matthews, Feinstein and Odling-Smee (1982) of specifying in advance the break-points. Crafts and Mills (2004) have argued that the role of steam has been overplayed.

¹⁰⁶‘Belated adaptation to earlier sources of technical innovation, stimulated by the increase in the size of the productivity gap compared with the United States, by the jolt to the system administered by the war, and possibly also in some sectors by the depression; a decline in labour militancy in the aftermath of the General Strike of 1926, affected also by the growth of industry in new regions lacking old traditions of labour relations; and possibly improvements in entrepreneurship, particularly in recruitment’ (Matthews, Feinstein and Odling-Smee, 1982, p. 544).

¹⁰⁷This view has been put forward by Crafts (2004). Crafts does not dispute that TFP growth was high, particularly during the 1920s. However, he identifies a failure of the British interwar economy in comparative terms, that is the inability of Britain to match the results of a number of countries, such as the United States or Germany. To Crafts, this is largely due to a failure of the manufacturing sector, a view which is also shared in Broadberry (1998).

¹⁰⁸The estimation of total factor productivity growth and levels for Germany was limited by the reliability of the capital stock figures. As explained by Broadberry (1998), the data collected by

the growth of national income has been recently emphasised (Buhrop and Wolff, 2005). Primal side figures obtained by Wolff (1991) show that, although Britain enjoyed higher TFP levels than Germany throughout the period under consideration, this difference was eroded because of the substantially faster TFP growth enjoyed by Germany. German TFP growth over the 1880-1938 period was, on average, 1.20% per annum, higher than the 0.75% per annum of Britain. More details on the relative growth of TFP in Britain and Germany over the period are presented in Broadberry (1998), who presents data on relative TFP levels for different sub-periods, while also paying attention to the relative performance of the manufacturing and of the agricultural sector. His data show that German TFP tended to converge to the British level throughout the period under consideration. In Broadberry's number, the era between 1891 and 1911 was characterised by rapid convergence. As for the inter-war era, the years 1925-9 and 1929-1935 were also characterised by moderately fast convergence, which concentrated in the 1920s.

3.7.2 A comparative view on Italian TFP growth

Having reviewed the existing evidence on the evolution of total factor productivity in Britain and Germany, this Section will put the Italian experience in a comparative perspective. To do so, the dual estimates of TFP growth for Italy obtained in this paper are compared with similarly constructed ones for Britain and Germany.

Figure 3.3, presents a set of estimates which is based on our preferred models

Hoffman (1965) are available only at a highly aggregated level and are based in some cases on very limited information.

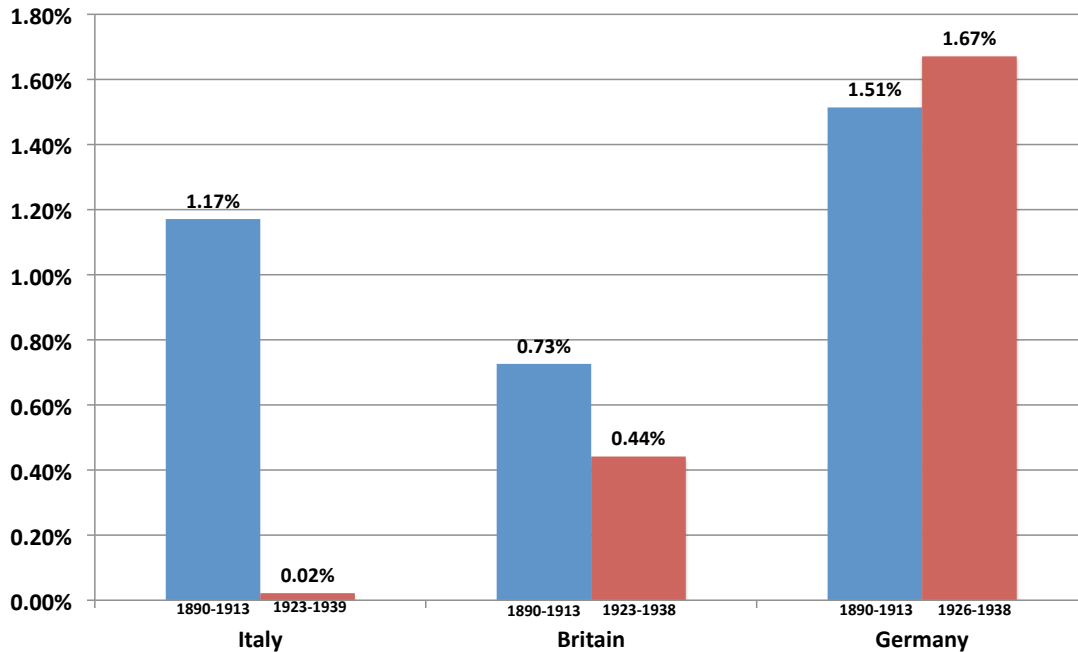


Figure 3.3: TFP growth rates for Italy, Britain and Germany, 1890-1939 (in %, per annum)

Sources: see text and Appendix 3.A

for the three countries. In the case of Britain, the model only includes labour and capital¹⁰⁹, while, in the case of Germany and Italy, includes land, labour and capital¹¹⁰. The estimates produced for Britain and Germany confirm the findings by Wolff (1991) and Broadberry (1998) that TFP growth in Germany was faster than

¹⁰⁹There is only a very weak case to include land. By the late 19th century, in fact, Britain was by all standards an economy based on industry and services. By 1881, the agricultural sector's share of national income was only 10% and its share of capital in 1885 was less than 25% (Turner, 2004, citing Collins, 2000). Agricultural rents as a proportion of total income were somewhere in between the 7% level reached in the 1850s and the 2% reached during World War I (Collins, 2000, citing Feinstein, 1972). It is not surprising, therefore, that the existing literature on TFP growth in Britain during the period has left land out of the calculations (see Matthews, Feinstein and Odling-Smee, 1982).

¹¹⁰A full description of the data employed for Britain and Germany is provided in Appendix 3.A.

in Britain throughout the period. The figures obtained for Germany are fairly consistent with the rate of growth of TFP found by Wolff (1991), even though slightly higher¹¹¹. As for Britain, our figures differ from those presented by Matthews, Feinstein and Odling Smee (1982), as they suggest that TFP growth during the interwar years was slower than in the 1890-1913 period. These findings offer support to the doubts expressed by those revisionists who questioned the presence of a “climacteric” in the Edwardian era and by those who have talked of a British failure throughout the interwar era.

Turning to the performance of the Italian economy, Figure 3.3 shows that TFP growth in liberal Italy was lively even by international standards. TFP grew at a rate which was lower than the German one, but higher than in Britain. Figure 3.3 emphasises how the true failure of the Italian economy occurred during the interwar era. Between 1923 and 1939, Italy experienced zero TFP growth, a “climacteric” which halted the positive performance which had occurred throughout the late liberal era. TFP growth rates fell well below the ones experienced in Germany and in Britain.

Both comparisons appear particularly interesting. As for Britain, it is interesting to see how Italy appears to have done worse than a country whose performance in terms of TFP growth was, by all accounts, far from remarkable. If Britain failed

¹¹¹This may be explained by the fact that, differently from these other calculations, we exclude World War One, when, according to Broadberry’s figure Germany’s convergence halted. See Broadberry (1998).

during the interwar era, then it is impossible not to say the same about Italy. The comparison with Germany is also particularly interesting given the relative similarities of the economic structure of the two countries. The figures hereby presented confirm the view by Toniolo that, despite the similarities at a more superficial level, the Nazi economy was way more capable of producing productivity growth than the Fascist one. As put by Toniolo, ‘the difference with what occurred to the Nazi economy is huge. What is striking without being astonishing is how the strong diversion of resources towards heavy industry did not lead to generalised transformations in terms of productivity and technological growth’ (Toniolo, 1980, p. xxiii). Given the wider consequences of Nazi economic policy this finding should not be seen as entirely unwelcome. Yet, it confirms that the “failure” of the Italian economy during Fascism was not just due to the state of the global economy or to the choice of the particular development path, but was largely associated with the ineffectiveness in the design and implementation of the economic policies pursued by the regime.

3.8 Conclusions

This paper employed data on factor prices to obtain new estimates of total factor productivity growth for Italy for the period between 1890 and 1939. We relied on a dual approach to circumvent the problems associated with the poor reliability of the Italian GDP estimates for the period and to incorporate new information on the evolution of land rents and of the returns to human capital. These estimates were then compared with analogous ones for Britain and Germany, in order to put the

Italian experience in an international perspective.

The results, which appear substantially lower than those obtained in Rossi and Toniolo (1992; 1993), offer strong support for the “pessimist” outlook on the evolution of productivity in Italy during the Fascist era, siding with the views expressed by Toniolo (1980) and Ciocca (2007) and against those outlined by Gregor (1979) and Petri (2002). The different models and the robustness checks presented confirm that, during the interwar era, Italy experienced its “climacteric”, suffering from TFP growth which was weak as compared both to the previous period and to the contemporary performance of other European countries. Far from being a developmental dictatorship, Fascism halted the healthy rates of TFP growth which had occurred during the period of the late liberal Italy, reducing them to close to zero. The international comparisons show that not only did Italian TFP growth rates lag behind the “locomotive” Germany, but that they also slowed down compared to Britain, a country whose performance over the period has traditionally been seen as far from brilliant. The new estimates of TFP growth for the Fascist era appear reasonable even in light of the link between productivity growth and living standards which has been emphasised by Antras and Voth (2003) with regard to the case of Britain during the Industrial Revolution¹¹². The worsening of living conditions during the Fascist era emphasised by Zamagni (1993a) appears much easier to reconcile with

¹¹²The dual approach also highlights the close connection between productivity growth on the one hand and the course of living standards on the other. Some scholars appear comfortable with a pessimistic view of changes in living standards, while at the same time arguing that productivity growth has been understated [...] These are contradictory positions, as dual measurement of productivity growth makes clear’ (Antras and Voth, 2003, p. 71). See also Voth (2003, p.223).

low than with high rates of TFP growth.

Two sets of questions spur from these results. The first one is what drove economic growth during the Fascist era. As these estimates downplay the role played by technical change, structural change and factor accumulation remain as the two most obvious candidate explanations. As for the former factor, in Section 3.5 we have argued that using a simple weighted average wage instead of our favourite wage index would have led to a significant overestimation of “true” TFP growth because of the significant shift of workers out of agriculture into industry. This finding suggests that, at least at the level of the overall economy, economic growth under Fascism is likely to have benefitted from structural change. As for the role of factor accumulation, some understanding can be gained by looking at the behaviour of individual factor prices. In particular the negative growth rate of the real rental rate of capital can be explained as the result of a process of capital accumulation which was not accompanied by technical change. This explanation appears even more convincing in light of the evidence showing that the fall in the real price of capital is unlikely to have been caused by a worsening in the quality of the capital stock¹¹³. Conversely, differently from the pre-World War One era, growth during the Fascist era is unlikely to have benefited from fast human capital accumulation. The rise in the real skill premium which we observe in the data is, in fact, likely to have been caused by the inability of the supply of skills to keep up with the increase in demand caused by the skill-biased technical change which characterised the second industrial revolution.

¹¹³Relatively to the industrial sector, the importance of capital accumulation in explaining productivity growth is confirmed by the regression analysis we perform in Chapter 4.

A different question concerns what can explain such a weak performance of technical progress. Given the difficulties associated with finding long-run series for the individual sectors of the Italian economy¹¹⁴, this paper has only looked at the aggregate trends. Yet, it is likely that an in-depth analysis of the industrial sector would bring results which are in line with those presented here, confirming the hypothesis that industrial policy mattered in slowing down productivity growth¹¹⁵. Systemic failures should also be emphasised: the regime's rhetoric about the importance of innovation and technical progress was not matched by a concrete effort to promote them. Money was scarce, the bureaucracy excessive and the environment built around incumbent firms too cushy to push them to innovate. As Petri (2002) has documented, there were some positive examples of knowledge-transfer from abroad, but the limited evidence available about patents shows that independent innovative activity slowed down significantly during this era.

In 1926, in a speech given to the Italian Society for the Progress of Science (SIPS), Mussolini acknowledged that there had been a severe delay in the promotion of scientific research. Mussolini stated that his contribution to the fostering of research had been *un bel nulla*, that is, "absolutely none". That was correct and, to say the least, prophetic about the times to come. Although historians have often blamed the *Duce* for his lack of coherence and continuous changes of mind, one cannot deny

¹¹⁴In particular, series for the price of capital in the different sectors of the economy appear particularly elusive.

¹¹⁵A negative link between industrial policy and labour productivity growth over the period 1921-1951 is found in Chapter 4 of this thesis, to which we refer.

that, at least in this aspect of economic policy, his views, and, most importantly, his results, displayed nothing short of a remarkable consistency.

3.A Data appendix for Britain and Germany

Britain

Wage Rate: Data on weekly earnings (Feinstein, 1995) are employed. Data refer to the agricultural and the industrial sector, so TFP growth estimates could be affected by structural change. However, it is widely known that Britain had already moved much of its labour force out of agriculture well before the period under consideration, so the bias will not be significant. Data are corrected for changes in the number of hours worked per week. For 1890-1913, the number of hours worked per week comes from Huberman and Minns (2007, p. 542). The data are linearly interpolated for missing years. As for 1923-1938, the data come from Matthews, Feinstein and Odling-Smee (1982), who provide an estimate for 1924 and 1937, which is linearly interpolated. The data for 1938 comes from Huberman and Minns (2007, p. 542) and is very similar to the one provided by Matthews, Feinstein and Odling-Smee (1982) for 1937.

Price Index: Gross domestic product deflator from Feinstein (1972), Table 132.

Price Index for Capital Goods: For the period 1890-1913, Feinstein and Pollard (1988, pp. 470-1); for the period 1923-1938, Feinstein (1972), Table 61.

Interest Rate: Market determined real-interest rates are employed. Following Hall (1990, p. 18) data on dividend yields are used. The data come from two sources. For the pre-World War One era, we use data on the dividend yield of equities traded on

British exchanges, weighted by market capitalisation, which are taken from Grossman (2002, p. 136). The data include 40,677 observations on 3,103 securities issued by 2,740 companies. These are companies doing business primarily in Britain, as well as foreign companies listed on British exchanges. Although the author does not say what proportion of his dataset is made of this last group, this should not significantly bias our results. As for the interwar era, data on dividend yields taken from *Global Financial Data* are used. The data come largely from London and Cambridge Economic Service (1964), which presents a continuous series of annual average prices of industrial ordinary shares in the United Kingdom from 1900 to 1976, with dividend yields attached. This is preferred to the Barclays-de Zoete-Wedd (BZW) index as this series is based on more securities (De Long and Grossman, 1993).

Depreciation Rate: It is obtained dividing depreciation by the gross capital stock. For the period 1890-1913, data on depreciation come from Feinstein and Pollard (1988, p.429) and data on the gross capital stock from Feinstein and Pollard (1988, p.427); for the interwar era, data on depreciation come from Feinstein (1976), Table 47 and data on the gross capital stock from Feinstein and Pollard (1988), Table 46.

Factor Shares: The shares employed for labour and capital are, respectively, 0.635 and 0.365. This is an average between the shares employed for the two sub-periods 1890-1913 and 1923-1938 by Matthews, Feinstein and Odling-Smee (1982).

Germany

Wage Rate: The wage rate used in the TFP calculations for Germany employs the series for nominal annual earnings by Hohls (1995, pp. 220-221). This series is chosen over the series by Bry (1960) for two main reasons. Firstly, while the series by Bry (1960) only covers industry, the series by Hohls covers 35 branches of the German economy, including a range of branches in agriculture and in the service sector. Secondly, as discussed in Wiegand (1982) and Broadberry and Burhop (2009), the series by Hohls employs data from accident insurance statistics, a dataset which is superior to the one employed by Bry (1960). The main problem with the series employed by Hohls concerns the fact that there were significant changes in the number of hours worked over the period. To correct for these changes, data on the number of annual hours worked (Huberman and Minns, 2007, p. 548) are used. The data are interpolated linearly for missing years.

Price Index: Net national product deflator from Hoffmann (1965, pp. 825-28).

Price Index for Capital Goods: For the period 1890-1913, the price of capital goods from Hoffmann (1965, pp. 598-600) is used. For the period 1926-1938, the superior industry-specific series of the price of capital goods as in Baumgart and Krenzel (1970) is employed. The authors present a price index for construction goods and and branch-specific price indices for equipment. The construction price index refers to the building prices of residential buildings, adjusted for changes in the composition of material and factor inputs in the construction of the "standard building".

The direct data source is the *Statistisches Jahrbuch für die Bundesrepublik Deutschland*, as published by *Statistisches Bundesamt*. Conversely, the branch-specific price indices for equipment were constructed on the basis of wholesale prices for capital goods, which were drawn from the *Statistisches Jahrbuch für das Deutsche Reich*, published by the *Statistisches Reichsamt* in 1933 and 1941-2. In order to combine these series into an individual index, information on the size of the capital stock in different branches in 1939 is used. This procedure was devised and first employed by Vonyó (2011).

Interest Rate: Market determined real-interest rates are employed, using data on the return on equity of German industrial stock corporations from Spoerer (1996). The original source is the *Bilanzstatistik*, a branchwise aggregation of disclosed balance sheets of stock corporations compiled and published by the *Statistische Reichsamt* and its predecessor dating back to 1870. We use data on the return on equity as disclosed, referring to all branches of the industrial sector over the 1890-1938 period (see Table 1; Table 6, column h (A)). It should be noticed that the returns on equity from the *Bilanzstatistik* for the interwar period is likely to be underestimating the real growth of the return on equity, particularly in the late 1930s, because of likely under-reporting. This point, which has been repeatedly made by Spoerer (1996), means that our estimates for the growth rate of the real rental rate of capital are likely to underestimate the growth of this variable, biasing our TFP growth measure downwards.

Depreciation Rate: In the absence of data, the relevant British series is employed.

Land Rent: For the period 1890-1913, data from Hoffmann (1965, pp. 569-70) are employed. This series does not cover the whole of the interwar era, so, for the period 1926-1938, we assume that the land rents grew at the same rate as capital rents.

Factor Shares: The primal side data on the total compensation going to the factors of production is incomplete and extremely volatile (Liesner, 1989). Hence, one has to assume suitable factor shares. The first consideration to be made is whether or not one should include land in the model. Throughout the 1890-1938 period, Germany was considerably less industrialised than Britain. According to census data presented in Broadberry (1997), around 49.5% of the German population was employed in the agricultural sector in 1875, and this proportion was still equal to 29.9% in 1935. This is a higher proportion than the one employed in Britain in 1871 (22.2%), but lower than the one employed in Italy in 1936 (52%). Given these considerations, it seems important to include land in the model. We assume that the factor shares for labour, capital and land are, respectively, 0.6, 0.3 and 0.1. These are intermediate between those assumed by Crafts (2004) for the pre-World War I British economy (0.6, 0.4, 0) and the ones assumed by Crafts (1995) and Antras and Voth (2003) for the British economy during the Industrial Revolution (0.55, 0.35, 0.1). The share of land in Germany is anyway lower than the one for Italy (0.2).

3.B Data appendix for wages in the construction sector

In order to construct the series for the returns to raw labour and human capital, we rely on a range of sources relative to the hourly wages of adult male workers in the construction industry. For the period 1890-1913, we rely on the work by Vecchi and Del Papa (2003), who have used data collected by the *Corpo del Genio Civile*¹¹⁶ to estimate a ratio of skilled to unskilled wages over the 1861-1913 period. With the exception of Fenoaltea (2002), this is the only available series for the period which looks separately at the wages of skilled and unskilled workers in the same sector. Differently from Vecchi and Del Papa, however, Fenoaltea constructs his series for the wages of skilled workers ‘including data on unskilled workers from the industrial sector, as well as data on women and children’ (Vecchi and Del Papa, 2003, p. 2). These problems are absent from the work by Vecchi and Del Papa (2003), leading us to prefer this series over Fenoaltea’s one. The data from Vecchi and Del Papa cover eighteen of the sixty-nine Italian provinces, including almost all the regional capitals. The data for skilled workers relate *muratori di prima classe*, while the data for unskilled workers relate to *manovali*¹¹⁷.

Differently from the era of liberal Italy, there is no existing study looking at the

¹¹⁶This was the division of the Ministry of Public Works in charge of compiling the budgets for the different public work projects. For more information on the division and on the data sources, see Vecchi and Del Papa (2003, pp. 2-5).

¹¹⁷For more details on the tasks undergone in these two jobs, see Vecchi and Del Papa (2003, pp. 5-6).

evolution of the wages of skilled and unskilled workers over the whole of the Fascist period. The existing evidence concentrates on the period up to 1930. For this period, one can rely on the study by Lasorsa (1931), who collected data on the salaries of skilled and unskilled workers in a range of professions, including construction, over the 1920-9 period, both for Italy as a whole and for a range of Italian cities. For the case of the construction industry, the series can be extended to 1932 using the primary source Lasorsa relies on, namely the *Bollettino Statistico del Ministero dei Lavori Pubblici e dell'Azienda Autonoma Statale della Strada*, a publication from the Ministry of Public Works containing information on the public works commissioned by the Italian State. Unfortunately, the publication of data on hourly wages is suspended in 1932. Thereafter, the data are only available in a range of provincial legal bulletins (*Fogli degli Annunzi Legali*), each one containing information on an individual province only. For this reason, it was decided to concentrate on the province of Rome. For the period 1920-9, we employed data on the daily wages of masons and labourers in the city of Rome, taken from Lasorsa (1931, p. 91) and assume that both types of workers worked for the same number of hours, as in Zamagni (1976, p. 378). For the period 1930-2, we used the hourly wages relative to the city of Rome collected from the *Bollettino Statistico del Ministero dei Lavori Pubblici e dell'Azienda Autonoma Statale della Strada* and relative to *muratori* and *manovali di prima classe*. There is a blank in the data between 1933 and 1937. As for 1938 and 1939, we collected data relative to Roman *muratori* and *manovali edili in genere* from the *Fogli degli Annunzi Legali della Provincia di Roma*.

Chapter 4

A Tale of Two Fascisms[†]

4.1 Introduction

The evolution of labour productivity in Italian industry over the interwar era has been mainly looked at from an aggregate point of view. Filosa, Rey and Sitzia (1976) have shown that it was generally slow throughout the 1922-1938 period. More recently, Broadberry, Giordano and Zollino (2011), in their long-term analysis of Italy's growth process, find similar results, with not only growth rates falling, but also comparative labour productivity levels relative to the UK deteriorating after 1911. And since the US was ploughing ahead in those years, it is clear that Italy was dropping even further behind from the new technological frontier. Only after World War Two

[†] *This chapter is based on joint work with Claire Giordano, Divisione Storia Economica e Finanziaria, Banca d'Italia. We are grateful to Brian A'Hearn, Emanuele Felice and Anna Missiaia for commenting on earlier versions of this paper, as well as to participants to a seminar in Oxford. We also thank Stephen Broadberry, Carlo Ciccarelli and Kevin O'Rourke for useful suggestions and Stefano Fenoaltea and Emanuele Felice for sharing unpublished data with us. The usual disclaimer applies.*

did Italy decidedly embark on a catching-up trajectory.

An aggregate analysis is, however, far from satisfactory. Studies conducted over the last twenty years on a range of countries¹ have shown that the evolution of labour productivity in the different branches of the industrial sector was generally heterogeneous. Even when grouping branches together, “new” industries often experienced rates of productivity growth which were very different from those registered by the “old staples”². Disaggregated analysis, important *per se*, also enables researchers to use shift-share analysis to distinguish whether productivity growth was due to internal productivity growth or to structural change, i.e. shifts of resources from low-productivity level industrial sectors to high-level ones. Lastly, disaggregated data can allow researchers to exploit the cross-sectional variation between industries to better study which factors truly drove productivity growth and, in particular, whether a given type of industrial policy had a positive or a negative effect on productivity growth.

All the mentioned lines of research are particularly appealing in the Italian case. The asymmetric performance of old and new industries, the role of structural change and the impact of active industrial policies in the interwar period have all been referred to in the literature. The division between new and old industries is particularly important, so much that Tattara and Toniolo (1976) have openly talked about

¹For example, for Britain and the US, see, among others, Broadberry and Crafts (1990b; 1992), Broadberry (1997) and De Jong and Woltjer (2011); for Britain and Germany, see Broadberry and Fremdling (1990) and Fremdling, De Jong and Timmer (2007).

²For example, in the British case, see Broadberry and Crafts (1990a).

a “dual economy”: using information from the industrial censuses taken in the second half of the 1930s, they argued that the productivity gap, as measured in levels, between new and old industries was larger in Italy than in Germany or in Britain (Tattara and Toniolo, 1976, p. 150). In their view, this gap was the consequence of the different dynamics in investments, with the level of horsepower rising much faster in the new industries than it did in the old ones. Although the two scholars do not analyse productivity dynamics in detail, they hint at the fact that such differences in levels may have not translated into large productivity growth differentials. This is because employment dynamics largely followed those of investments, so that structural change might have actually hampered productivity growth *within* new sectors by increasing employment more than output.

An analysis of structural change within industry³ cannot, however, be detached from a more general analysis of Fascist industrial policy, which tended to favour new industries over the old staples. The decision to revalue the lira in 1926-7 and the increase in import duties which accompanied it favoured the more modern sectors of the Italian economy while penalising the export-oriented old industries, starting what has been defined as ‘a deliberate policy of forced redistribution of resources’ (Tattara and Toniolo, 1976, p.105). This included a general retrenchment from competition in the product market. Although the literature has emphasized the importance of this retrenchment, doubts remain over whether its impact on productivity growth was positive or, in fact, negative. This question can also be answered via a disaggregated

³Broadberry, Giordano and Zollino (2011) measure the effects of structural change between agriculture, industry and services, which we here do not touch upon.

analysis of productivity growth.

The only study that has thus far looked at the evolution of labour productivity in the individual sectors of Italian industry is a preliminary conference paper by Bardini (1998)⁴, which presented information on labour productivity of 28 sectors of Italy's manufacturing industry for the three benchmark years 1911, 1936 and 1951⁵. Bardini found that *(i)* Italian heavy industries did not start off badly in 1911; *(ii)* structural change during Fascism was accompanied by some gain in relative productivity in the heavy-industry sectors; and *(iii)* the light industries generally experienced only small improvements in productivity. The main conclusion of his paper is that 'Italian heavy sectors seem to have been in better waters than it is generally thought [...] and the growth of their relative weight results as the major dynamic component of Italian manufacturing in the first period of our study [1911-1936]; if anything, one could rather argue that the restructuring in favour of them was not pushed far enough' (Bardini, 1998, p. 99).

The limitations of Bardini's study are twofold. Firstly, Bardini treats the period between 1911 and 1936 as a single time span, without accounting for its heterogeneity. This appears unfortunate, as industrial policy changed quite dramatically towards the end of the 1920s and a good understanding of the period calls for an

⁴This work builds on Bardini (1996).

⁵The nature of the paper is such that little information is provided on how the estimates are obtained and why certain data choices were made. Furthermore Bardini himself states that his results are preliminary, 'with much room for improving them' (Bardini, 1998, p. 95), a venture he unfortunately never pursued.

examination of this discontinuity. Secondly, Bardini does not attempt to single out the individual factors driving productivity growth. The techniques he employs allow to distinguish between internal productivity growth and structural change, but do not provide an examination of the potential impact of Fascist industrial policy.

Our paper aims to address these two shortcomings. Firstly, by employing the new disaggregated yearly series for industrial value added produced by Carreras and Felice (2010)⁶ we are able to analyse the performance of the different sectors of Italian industry between 1911 and 1951, introducing a larger set of benchmarks and paying close attention to the discontinuity occurring at the end of the 1920s. By doing so, we are able to track down more precisely when productivity growth accelerated and when exactly structural change occurred. Secondly, by relying on a newly compiled dataset, we construct an econometric model to better understand the drivers of productivity growth. In particular, following Broadberry and Crafts (1992), we aim to assess whether the anticompetitive industrial policy pursued by the Fascist regime had a positive or a negative effect on productivity growth, helping or hindering the development of the Italian economy.

The paper is constructed as follows. Section 4.2 provides a short account of industrial policy in post-Unification Italy, with a specific focus on the Fascist era. A range of qualitative and quantitative indicators show that competition in the product market was effectively reduced circa 1927 and that this reduction largely

⁶A discussion of why the Carreras and Felice (2010) series is employed despite the limitations outlined in Chapter 2 is provided in Section 4.3.2.

characterised the new industries. This section justifies our choice of splitting the analysis of labour productivity into more sub-periods than was done in previous work; it also confirms the importance of analysing the impact of competition policy on the evolution of labour productivity. The first task is undertaken in Section 4.3. This Section displays our findings on the evolution of labour productivity growth in Italian industry between 1911 and 1951, using a larger number of benchmarks than in Bardini (1998). Three sets of results emerge. Firstly, over the 1911-1951 period old industries grew at rate which is comparable to the one of new industries. Secondly, the 1930s were characterised by slower productivity growth than the 1920s. Thirdly, productivity growth was largely driven by internal productivity growth, with structural change only playing a role in the 1920s, that is before the regime's active intervention. These results, which are found to be largely robust to the inclusion of newly compiled data on changes in the number of hours worked, would suggest that Fascist industrial policy hampered productivity growth. This claim is corroborated by evidence presented in Section 4.4. In this section, we employ standard panel data techniques to better understand the link between Fascist competition policy and labour productivity growth. Our econometric evidence shows that the reduction of competition went hand in hand with a slowdown in productivity. This result, which is robust to the inclusion of a range of control variables, is confirmed by a set of more qualitative evidence which we also include in this Section. The conclusions of our paper are presented in Section 4.5.

4.2 Shifts in Italian industrial policy

The existing quantitative literature on productivity in Italian industry has treated the Fascist era as a homogenous period. The analysis by Bardini (1998) went as far as finding a continuity between the 1910s and the years of Fascism. Bardini's argument is that World War One marked a strong acceleration in state intervention in the economy which was neither interrupted nor reversed by the Fascist regime. On the contrary, in the post-war environment the latter took measures to support those industries which had developed throughout the conflict. For this reason Bardini concludes that 'it does not seem too incorrect to look [...] at the changes in the whole 1911-1936 time span as the results of Fascist economic policy' (Bardini, 1998, p. 96).

Such considerations, however, clash with the periodisation conventionally used in the historiography. As remarked by Rossi and Toniolo, '1914-46 and even 1922-43 (the Fascist years) were far from being homogenous periods: not only were there exogenous shocks of a hitherto unprecedented magnitude, but economic policies were anything but consistent over time' (Rossi and Toniolo, 1992, p. 545). More specifically, the Fascist era has traditionally been divided between a more liberal period, covering the early part of the 1920s and one characterised by a more invasive industrial policy, which spanned between the end of the 1920s and World War Two.

As will be argued in this Section, the significance of this rupture goes beyond the mere periodisation of Fascism. In fact, the promotion of the new industries oc-

curing in the second era of Fascism and the tools through which this was carried out marked a discontinuity with the approach to industrial policy which had been taken before World War One and which had been temporarily suspended during the War before being resumed in the early 1920s. While industrial policy in these more liberal phases had come in the shape of trade policy, sporadic industrial bailouts and state purchases of goods, the late 1920s and 1930s saw four sets of measures being introduced, namely direct intervention in the labour market, autarky, direct state management of firms and cartelisation in the product market.

This section and this paper are mainly concerned with this last set of measures⁷ which, we argue, had a significant effect on Italian industry. We first outline the evolution of competition policy in Italian industry between the late 19th century and World War Two and then offer some quantitative evidence to back up our claims. In Section 4.2.1 we argue that industrial policy in the pre-World War One era was largely unconcerned with competition issues and was pursued through alternative avenues. In Section 4.2.2 we outline the changes introduced during the War and argue that they were largely reversed by the policies enacted in the first years of Fascism. This policy stance changed following the revaluation of the lira in 1926-7, which led to the introduction of a range of measures promoting concentration and cartelisation. In Section 4.2.3, we present a range of new quantitative indicators, showing that competition in the product market did decrease significantly over the 1930s. This evidence justifies our decision to break up the Fascist era into two

⁷For a brief summary of the other two innovative channels in Fascist industrial policy, see Federico and Giannetti (1999, pp. 132-3).

phases, in particular by separating its early *laissez-faire* stage from its second, more interventionist spell. It also suggests that a full understanding of productivity growth over the Fascist period has to take into account the role played by the regime's anticompetitive policies.

4.2.1 Pre-Fascism industrial and competition policy

A three-pronged approach to industrial policy, 1861-1913

It would be a gross mistake to assume that active industrial policy came to Italy with the advent of Mussolini. In fact, after a relatively liberal period in the decades immediately following the country's political unification in 1861, the 1876 elections, which brought a left-wing government to power, led to a more interventionist policy stance. A detailed account of the policies pursued in those years and their impact is beyond the scope of this paper⁸. Yet, two points should certainly be made. Firstly, it is noteworthy that industrial policy in this period took a three-pronged direction, namely trade policy, public procurement and industrial bailouts⁹. Secondly, as it has been emphasised by a more recent literature which has already been touched upon in Chapter 1, its effects were not particularly significant. Economic historians had long been convinced that industrial policy had significantly shaped the development

⁸For an excellent summary, see Federico and Giannetti (1999, pp. 126-30).

⁹The Italian state, which had until then pursued a relatively free-trade policy inherited from the Piedmontese tradition, started to pursue an activist trade policy, initially raising its duties on a range of products (mainly textiles). In 1887, a new tariff on textiles was introduced, together with a duty on wheat and a new duty on pig iron and steel products. This policy was accompanied by state purchases of a range of goods, including weapons and railway stock, whose scale became more significant after national suppliers were given preferential treatment over foreign ones. With the support of the mixed banks, the Italian state also organised a range of industrial bailouts, including, for example, that of the steel-making firm Terni in the late 1880s.

of the Italian economy in the late 19th century¹⁰. However, more recent research by Federico and Tena (1998b) has shown that duties were not particularly high by European standards¹¹ and their impact on the performance of individual sectors was quite small¹². State purchases in the so-called ‘military-industrial’ complex were also relatively limited, with railways procurement only accounting for around 10% of total value added of engineering and steel products (Fenoaltea, 1982a, p. 129). Finally, industrial bailouts occurred with a much less pronounced frequency than what would happen during the Fascist era. These considerations have led recent researchers to suggest that Italy before World War One followed a “Mancunian” path to industrialisation (Sapelli, 1992; Amatori, 1980), characterised by a relatively limited level of state intervention in the economy which favoured, in particular, the more traditional industries located outside the “military-industrial” complex. The firms of these sectors displayed a remarkable proficiency in adapting foreign machinery (Giannetti, 1994) and in exploiting the low cost of labour to exploit modern labour-intensive technology (Federico, 1996), which allowed them to increase their competitiveness both domestically and abroad.

On the back of these considerations, it should not be surprising that, in spite of

¹⁰For instance, for the case of trade policy, Gerschenkron (1962) criticised the choice made by the government to protect textiles, arguing that mechanical engineering would have been a better choice. Bailouts and state purchases were also seen as helping the development of a “military-industrial” complex, with heavier industries being helped to benefit from economies of scale in spite of a small domestic market.

¹¹They hardly ever exceeded 25 – 30% and were often around 15%.

¹²See Toniolo (1977) on the relatively small losses caused by the protection of steel. Even more recently, Federico and O’Rourke (1999; 2000), by estimating a Computable General Equilibrium (CGE) model for Italy in the year 1911, have come to the conclusion of the ‘unimportance of tariffs’ (Federico and O’Rourke, 2000, p. 29), at least in the twenty years running up to 1911.

the absence of a strong competition law regime, such as the one present in the United States¹³, pre-World War One Italy did not see a rapid rise of industrial concentration or a widespread formation of cartels. There is little quantitative evidence on this aspect, most of which is presented in the work by the economist Francesco Vito, who thoroughly researched the role of cartels in the world and in the Italian economy (Vito, 1930; 1932; 1960; 1961). When describing the rapid evolution of concentration and cartelisation in the Italian economy of the 1930s, Vito noticed how different this process was from what had occurred in the previous years. His figures show that the number of mergers and acquisitions occurring in Italy between 1883 and 1927 was only 219, which, as will become clear when we will examine evidence relative to the Fascist era, was quite low. Cartels were also not particularly widespread. In his 1932 *magnum opus* on the subject, Vito remarked that ‘in Italy, at the turn of the century, cartels were an exceptional form of industrial organisation, which explains why Italian commentators who wanted to write on the subject at the time had to look abroad for examples’. In later years, Vito noticed, the creation of cartels accelerated, though this process occurred at a pace which was ‘relatively less intense than elsewhere’ (Vito, 1932, p. 291).

The relative scarcity of cartels can be easily reconciled with the pattern of industrial policy and development outlined by the revisionist literature. This association is made by Vito himself. The scholar, in fact, noticed that cartelisation is more effective and easier to coordinate in an economy with few large firms. As Italy was charac-

¹³The Sherman Act was passed in the United States in 1890.

terised by a large number of small and medium enterprises, and as the government had done little to promote those industrial sectors which tend to be characterised by larger firms, the role of cartels in Italian development was way smaller than in Germany or, despite the presence of the Sherman Act, the United States (Vito, 1930, pp. 281-4). As emphasised by another contemporary economist, Fausto Pitigliani, most of the cartels organised in the pre-World War One era were in fact agricultural or highly localised (Pitigliani, 1940).

The impact of World War One

Similarly to other countries in Europe, World War One played a significant role in increasing the scope and intensity of industrial policy in Italy. Public procurement became larger in scale, particularly towards the industries of the “military-industrial” complex. There was a proliferation of planning bodies, with the creation of 297 *commissioni speciali per l’economia di guerra* (“special commissions for the war economy”). A particularly important body was the *Mobilitazione Industriale* (Industrial Mobilisation), the arm of the Ministry of War in charge of dealing with private producers¹⁴. This body was in charge of determining which firms were to be considered as “auxiliary firms”, and could therefore enjoy special prices, contributions to investment and a range of fiscal exemptions¹⁵. Because of the advantages tied to this status, it is unsurprising that the number of auxiliary firms kept rising throughout

¹⁴The *Mobilitazione Industriale* was created with two decrees passed on 26th June and 22nd August 1915.

¹⁵The *Mobilitazione* would also coordinate the activity of auxiliary firms with the military factories, intervene in case of economic controversies, overlook the work done by women and minors and manage the training schools for new workmen.

the war, going from 221 in 1915 to 1,976 by the end of the war, when they would employ over 580,000 workers (Caracciolo, 1978b, pp. 208-10). Most importantly for our analysis, these firms were not located uniformly across sectors. Of the mentioned 1,976 auxiliary firms, over 56.7% was located in chemicals, engineering and iron and steel (Caracciolo, 1978b). As a result, this particular discrimination introduced during the war helped the development of new industries in a very significant way.

Although they were not part of a deliberate attempt to curb competition, other aspects of the war economy also ended up distorting the market and favouring a switch towards a more concentrated industrial sector. In particular, the progressive rationing in the supply of raw materials meant that firms either had to lobby to receive a large share of a depleting stock or had to find ways to obtain raw materials independently from the state. This problem was particularly acute in the case of energy supplies, which the government often had to import from its war allies. The rationing process ended up favouring larger firms. It also contributed to the growth of concentration and the strengthening of oligopolistic or monopolistic powers by certain groups (Caracciolo, 1978b, p. 212). Overall, as put by Caracciolo, ‘one can conclude that this emergency situation, which was prolonged for many years, represented a non-negligible discriminating factor among producers and strengthened dominant groups in the heavy industry’ (Caracciolo, 1978b, p. 215). The list certainly includes the vertically integrated conglomerate Ansaldo whose production ranged from iron ore to warships, as well as the aircraft manufacturer Caproni and the car manufacturer Fiat.

4.2.2 Industrial and competition policy in the age of Fascism

A liberal Fascist phase

The discontinuity marked by the war did, initially, spill-over into the post-World War One era. This is evident from the decision taken in 1921 to approve a new general tariff which raised duties on chemicals, engineering goods and steel products. The new tariff was the most tangible sign of the fact that the war had strengthened the arguments of protectionists against free-traders and that trade policy was now taking a stance which was more openly in favour of the new industry. Furthermore, in 1921 a banking consortium led by the Banca d'Italia bailed out the industrial giant Ansaldo, enacting a rescue operation which resulted in the state taking over the industrial concern (Saraceno, 1981). Although this marked a discontinuity with previous bailouts, in that it was the first time the state actually came to own a manufacturing firm, it must be noticed that the state's main preoccupation was that of swiftly selling off the shares and not starting out a full scale industrial policy such as the one which will be undertaken as of the 1930s (Toniolo, 1980, p. 244). In fact, the surprising aspect of the first phase of the Fascist era is that, differently from what is argued by Bardini, the discontinuity brought in by the War did not seem to be long-lived. The measures introduced in the early era of Fascism were largely reminiscent of the three-pronged industrial policy promoted in the pre-World War One era and their scale also appears limited.

When Fascism came to power in 1922, in fact, its industrial policy was very much contiguous to the one of the pre-World War One era. The rhetoric displayed by

Mussolini around that time was supportive of a ‘hands-off approach’ to the running of the economy¹⁶. This belief was mirrored by the appointment as Finance Minister of the liberal academic Alberto De’ Stefani, ‘one of the few ministers, in twenty-three years of Fascism, who was above average competence and matched most of his predecessors in intelligence and honesty’ (Mack Smith, 1981, p.118). Although one should not exaggerate the view of De’ Stefani as a free-marketeer¹⁷, the measures he took during his short term as minister remained largely in line with the industrial policy observed in the pre-World War One period, marking, in this sense, a break with the war economy.

Although the government insisted in bailing out companies in trouble, either directly or through mixed banks¹⁸, De’ Stefani’s management of public finances showed a decisive drive in reducing the amount of government spending, which fell from 35% of GDP in 1922 to 13% in 1926 (Toniolo, 1980, p. 49). This was also the year in which the government budget was finally balanced (Toniolo, 1980, pp. 48-9), falling from a deficit of 23% of GDP registered in 1921 (Toniolo and Salsano 2010, p. 11). As for the trade policy the government chose to pursue, this took a decisively pro-competitive turn. Between 1922 and 1926, De’ Stefani signed 19 agreements, all

¹⁶Mussolini’s initial rhetoric displays a belief that government intervention ‘was absolutely ruinous to the development of the economy’ (Mack Smith, 1981, p. 117). Also, the contemporary economist Benvenuto Griziotti (1926, p. 26) recalls that when the programme of the Fascist National Party came out in 1922, the liberal economist Luigi Einaudi described it on the Italian daily *Corriere della Sera* as marking ‘a return to the liberal ideas of classical economic policy’.

¹⁷Marcoaldi (1986, p. 14) has argued that, at the theoretical level, his conception of the economy was ‘very different from that of theoretical liberalism’, whereas, more recently, Guidi (2000, p. 34) has defined De Stefani’s economic policy as inspired by an ‘authoritarian *laissez-faire*’.

¹⁸This was the case of Ilva, a steel-producing firm, which was rescued by the Banca Commerciale and the Credito Italiano under the auspices of the Italian government. See Toniolo (1980, p. 56).

aiming at reducing the rate of protection enjoyed by Italian goods abroad. The 1921 tariff was also mildly lowered, so that the average rate of protection on Italian goods fell from 10.3% in 1922 to 8.4% in 1925 (Toniolo, 1980, pp. 53-4). De' Stefani's tentative attempt to reduce protectionism did not gain him friends and, in fact, contributed to his downfall¹⁹. When, in March 1925, he attempted to curb a flurry of speculation on the stock market, this resulted in a market crisis which 'helped to crystallise smouldering resentment against him' (Sarti, 1971, p. 58)²⁰. His free-trade policies, which had done little to help newer industries, were criticised by a number of influential senators. Unsurprisingly, on 8th July 1925, Mussolini announced the resignation of his Finance Minister, a decision which was also very much welcome by the industrial establishment (Lyttleton, 1974, p. 546).

In his seminal account of the economic history of Fascist Italy, Toniolo writes that, when judging De' Stefani's term, 'the view that it consisted in "continuity" with the previous financial, fiscal and banking policy would seem to be much nearer the mark than the idea that it represented a form of free-market, liberal policy [...], which is basically foreign to this country' (Toniolo, 1980, p. 247)²¹. This appears largely correct, as his policies were hardly liberal in an orthodox sense. Yet, two points should also be made. Firstly, differently from what is argued by Bardini, the

¹⁹See Toniolo and Salsano (2010, p. 13) for a description of the opposing views on trade policy amongst industrialists in those years. Whereas industries which depended on imported raw materials, fuel and machinery were in favour of reducing tariffs, Italian exporters were against this measure.

²⁰See also Toniolo and Salsano (2010, pp. 18-20).

²¹More recently, in Toniolo and Salsano (2010, p. 11) the two scholars define the Fascist liberal phase as 'the revival of the Giolitti era fiscal orthodoxy'.

period by De' Stefani does mark a break from the more intrusive industrial policy which had understandably characterised the Italian economy during World War One. His decision to limit government expenditure and reduce tariffs are emblematic in this direction. Secondly, if one accepts the revisionist view that, despite all the false rhetoric about the importance of the "military-industrial" complex, pre-World War One economic development in Italy was more "Mancunian" than it was previously thought, the continuity view on De' Stefani's term rightly emphasised by Toniolo can be easily accompanied by a relatively benign judgement on De Stefani's free-marketism. As state intervention had not been so significant before World War One, De' Stefani's policies were both relatively "Mancunian" and continuative of the stances taken by previous governments.

Quota 90

Most importantly, De' Stefani's policies appear significantly different from the stances taken by the Fascist government as of his resignation. His successor was Giuseppe Volpi, a Venetian industrialist and financier who was close to the entrepreneurial establishment²². Although Volpi's holding office as Finance Minister was short-lived²³, his appointment was a clear message to the industrial establishment, which had long demanded more state support (Toniolo, 1980, p. 79). Unsurprisingly, among Volpi's first decisions there was an increase in a range of tariffs²⁴. This was certainly sym-

²²For a detailed biography of Volpi, see Romano (1979).

²³His term only lasted between July 1925 and July 1928.

²⁴Volpi re-introduced the tariff on wheat, cereals and their derivatives, which had been suspended as of 9th June 1921. He also doubled the duty on sugar which, again, had been suspended by De' Stefani in July 1923. Volpi also increased the duty on newspaper paper and on artificial silk, as well as abolishing the customs exemptions on import machinery.

bolic, though not sufficiently significant to make it a breakpoint in Italian industrial policy²⁵. The true paradigm shift in industrial policy occurred circa 1926-7²⁶. The key moment was Mussolini's decision to wage the "battle for the lira", that is the regime's decision to re-enter the gold standard and to fix the exchange rate parity with the pound sterling at 90 to one, the so called *Quota 90*²⁷. The intention to pursue this policy was first announced during the so-called Pesaro Speech held on 18th August 1926, but only became reality on 21st December 1927, when full convertibility of the lira to gold and to foreign currencies was reinstated. In particular, the lira was pegged at 92.46 lire to the pound.

Although Toniolo has argued that, in terms of purchasing power parity, *Quota 90* was just right (Toniolo, 1980, p. 123), it is also true that most industrialists, economists and policymakers favoured a lower exchange rate. Before the Pesaro Speech, the lira had been fluctuating around an exchange rate of 150 to the pound, so rejoining at 120 lire appeared a more realistic target as it would have entailed

²⁵In this respect, Toniolo's definition as 1925 as an *anno cerniera*, or "hinge year" (see Toniolo, 1980, p. 74), in Italian Fascism appears true more from a political than an economic point of view. This seems to be confirmed by the author: 'The change of pace [...] was self-evident and quick. It was a very clear political message' (Toniolo, 1980, p. 79).

²⁶This periodisation has ample support in the literature. See Ciocca and Toniolo (1976, p. 17); Rossi and Toniolo (1992, p. 545). Even more recently, Toniolo and Salsano (2010, p. 18) describe these years as a shift from an exchange policy based on 'benign neglect' to a more interventionist stance.

²⁷The wide-reaching consequences of this decision have widely been recognized in the literature. De Felice (1968, p. 222) went as far as defining it one of the key moments in the formation of the Fascist state. For a discussion of the short- and long-term macroeconomic costs of the return to the gold standard, which went hand in hand with a package of stabilization measures (that included raising interest rates, budgetary stabilization and debt consolidation), and restrictions of note issuance by Banca d'Italia, see Ripa Di Meana (1993).

less deflation and fewer trade restrictions²⁸. There has been a wide debate over the reasons behind this decision. Some have argued that the rate had an intrinsic appeal, as it was the one in force when the Fascists took power in 1922. Restoring it was a way for Mussolini to gain prestige (Mack Smith, 1981, p. 123), both internationally (Falco and Storaci, 1977, p. 17) and at home. Conversely, others have argued that *Quota 90* was consciously chosen to promote autarky, favour newer industries and facilitate government intervention (Gregor, 1979). This view has been rebutted by Cohen. In Cohen's view, the idea that *Quota 90* rewarded those who relied heavily on imported raw materials, while punishing those such as textile and food producers who exported a large proportion of their produce, was wrong. His argument was that, by lowering the price of all tradeables, *Quota 90* affected adversely both exporters and import competing firms. To Cohen (1988, p. 103), 'showing his usual political astuteness, Mussolini saw in Q 90 a way to gain prestige for his regime at home and abroad and, at the same time, to impose his political will on big business, the one group that still retained some autonomy'²⁹.

Cohen's view, however, appears to be somewhat narrow-minded. *Quota 90* did not come on its own but was accompanied by a range of policies which were clearly aimed at favouring some sectors of the economy over others. In particular, there was a generalised increase in tariffs (Guarneri, 1953, p. 134), which largely favoured the newer industries over the older ones. This is acknowledged by Cohen, who does

²⁸Volpi himself was sceptical of the *Quota 90* as he had long tried to stabilise the lira around *Quota 120*.

²⁹See also Cohen (1972).

not deny that such measures affected the composition of domestic demand. The point is that *Quota 90* and the new type of industrial policy should not be evaluated separately, as they were part of the same overall strategy. As argued by Toniolo, *Quota 90* was ‘tied to a game with the industrial leadership’ (Toniolo, 1980, p. 118) whereby concessions were awarded to a given set of industries in exchange for support in the implementation of the new policies. These negotiations were complex and, at times, quite tumultuous³⁰. Yet, the concessions were sufficiently large to bring at least big industrialists on the side of the regime. In April 1927, Antonio Stefano Benni, who was then heading Confindustria, wrote on *Il Popolo d’Italia* that rumors concerning the industrialists’ disapproval of Mussolini’s monetary policy were ‘stupid nonsense’ (Adler, 1995, p. 400). As underlined by Toniolo, some industrialists such as textile producers continued to complain (Toniolo, 1980, pp. 118-9), but their lamentations remained largely ignored.

Competition policy

A fundamental part of the deal struck between the regime and the industrial establishment was the decision by the government to favour concentration and cartelisation in the product market³¹. As it has been mentioned beforehand, these had remained largely limited phenomena in the Italian economy before World War One. Yet, all of this changed as of 1927. The political game started with *Quota 90* was, in fact, ‘aimed at commencing a large-scale experiment of corporatist management and car-

³⁰For a full account, see Adler (1995, pp. 353-7).

³¹In an international perspective, Italy was, however, not the only country to introduce cartelization-enhancing measures during the 1930s. For example, see Broadberry and Crafts (1992) for the UK or Alexander (1994) and Cole and Ohanian (2004) for the US.

tel formation in the main economic sectors, similar to the one which was occurring in Weimar Germany' (Toniolo, 1980, p. 118). The first step in this direction was a law providing fiscal incentives in favour of industrial concentration³². This law stated that mergers and corporate purchases were to be subject to a lump-sum tax of 10 lire, a low sum so as to explicitly encourage industrial concentration (Guarneri, 1988, p. 374).

The effects were immediate. According to later work by Vito, 'many firms decided to form links', leading to 'a powerful wave of concentration and cartelisation' (Vito, 1961, pp. 44-45). This wave did not halt shortly after, but continued over the following couple of years. According to data published in Vito (1930), between the second half of 1927 and the first nine months of 1929, 215 mergers occurred, as many as between 1883 and 1927. These involved 528 companies, for a total value of almost 9 billion lire of the time.

On the other hand, Table 4.1 offers some evidence that, even in 1929, the number of cartels in Italy was still relatively small by international standards³³. The Great Depression was the true watershed. The crisis in fact led the government to pass legislation which was more obviously favourable to cartels, in an attempt to

³²This was announced in a speech given by Mussolini to the Chamber of Deputies on 26th May 1927 and was implemented only a month later in the R.D.L. 23rd June, n. 1206.

³³It is clear that the absolute number of cartels in different countries is a poor indicator of the extent of cartelisation. The size and economic structure of the countries considered in the sample, in fact, differ significantly. Secondly, the data give no information on the coverage and effectiveness of the cartels at raising prices and reducing output. Nonetheless, Table 4.1 still offers some support for our overall argument.

Austria	94	Poland	58
Czechoslovakia	91	Russia	357
Hungary	41	Estonia	4
Switzerland	84	Latvia	3
Netherlands	15	Lithuania	4
Belgium and Luxembourg	59	Italy	28
France	66	Spain	17
United Kingdom	161	Portugal	2
Denmark	9	Jugoslavia	10
Sweden	31	Romania	21
Norway	44	Greece	5
Finland	31	Turkey	4
Danzig	3		

Table 4.1: The number of domestic cartels in the major European countries, 1929
Source: Vito (1930)

rationalise industrial production and to boost profits via price increases. Two laws, in particular, stand out. The first one was a law on ‘obligatory cartels’ (*consorzi obbligatori*), which was passed in June 1932³⁴, while the second one was the one on ‘voluntary cartels’ (*consorzi volontari*)³⁵, passed in April 1937³⁶. We will seek to

³⁴R.D.L. 16th June 1932, n. 834.

³⁵R.D.L. 22nd April 1937, n. 961.

³⁶With “compulsory cartels”, all firms in a given industry would be required by law to join a given cartel. Conversely, with “voluntary cartels”, firms would voluntarily decide to join one, leading to a less significant reduction in competition and allowing entrepreneurs not to lose the right to manage. Compulsory cartels created a dilemma for industrialists. As Adler (1995) put it, ‘they could not afford to refuse public assistance, nor did they want to risk public regulation by accepting public assistance’ (Adler, 1995; p. 419). Their main fear was that ‘compulsory cartels’ could be a first step towards an expropriation of their right to manage production. In order to solve the dilemma, the industrialists took a very pragmatic position. Although Antonio Stefano Benni, then president of Confindustria, had initially rejected Arnaldo Mussolini’s idea of ‘compulsory cartels’, when the law was passed, rather than opposing it, Confindustria managed to establish itself as the relevant administrative agency. Very much a ‘state within the state’, the industrial association ‘saw to it that compulsory cartels were essentially consensual: they would have to represent at least

assess the impact of these laws quantitatively in Section 4.2.3. Yet, it is useful to present here some initial evidence. According to Federico and Giannetti (1999), by 1938 the number of cartels in manufacturing had risen to 144 national and 111 local ones. This number rose further across World War Two. Figure 4.1, shows that the total number of cartels in Italian industry in 1942 was as high as 482³⁷.

Having favoured concentration and cartelisation, the regime also made it more difficult for new firms to enter a given market. This was done through a law on the discipline of industrial plants which was passed in 1933³⁸. This law obliged firms to apply for an authorisation in order to create new productive units or to expand old ones³⁹. According to evidence by Cianci, only 71% of the requests sent in between 1933 and 1937 were actually approved (Cianci, 1977, p. 233). The three major beneficiaries of the licenses were the chemical, steelmaking and engineering sectors (Sarti, 1971, p.108), evidence which, once again, points to a sectoral bias.

This law immediately stood out as an anti-competitive device. In Gualerni's words, the law 'allowed large incumbents to tactically use permits in order to create

four-fifths of any given sector, and their deliberative assemblies could take action only if two-thirds of the members were present' (Adler, 1995; p. 424-5). This meant that Confindustria made sure that the law on "compulsory cartels" 'remained a dead letter' (Sarti, 1971; p. 101) and that the legislation on *consorzi obbligatori* was effectively transformed into a promotion of *consorzi volontari*. The main outcome of the two laws was that Italy saw an overall promotion of voluntary cartels throughout the 1930s.

³⁷Unfortunately, the sources consulted do not reveal the proportion of the market which was cartelised in each individual sector or whether the cartel was regional or national. This limits the usefulness of this type of evidence.

³⁸R.D.L. 12th January 1933, n. 141.

³⁹The law disciplined all industrial sectors with the exception of construction and mining which had their own specific legislation.

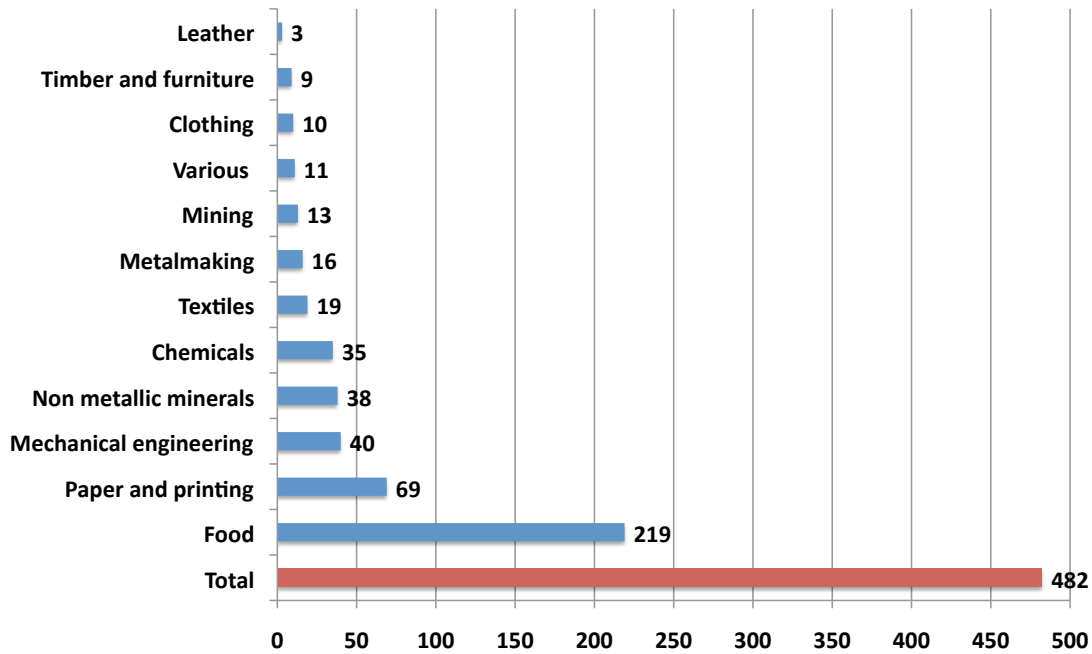


Figure 4.1: Cartels present in the different branches of Italian industry, 1942

Source: Giordano, Piga and Trovato (2011)

a powerful barrier to entry against possible competition’. As the firm applying for a permit was not obliged by law to build or enlarge the plant, a ‘large number of applications was, therefore, made, only to prevent competition’ (Gualerni, 1976, p. 177). In fact, once a license was issued, government officials would most likely reject similar applications to competing firms. In theory, a 10,000 lire fine would be imposed on those failing to act upon a granted license. Yet, as Covino, Gallo and Mantovani (1976) have pointed out, the sanction was rarely applied. Furthermore, as explained by Sarti, even when it was applied, the fine was ‘a relatively small sum given what is at stake’ and was therefore treated as an ‘insurance against competition’ (Sarti,

1971, pp. 108-9)⁴⁰. The quantitative evidence seems to support this view. Gualerni shows that, by the end of World War Two, when licensing was discontinued, only 414 out of 5,114 new plants for which an authorisation had been requested were actually built (Gualerni, 1976, p. 177)⁴¹. In his words, the figures show that the law ‘allowed large incumbents to tactically use permits in order to create a powerful barrier to entry against possible competition. As the firm applying for a permit was not obliged by law to build or enlarge the plant, a ‘large number of applications was, therefore, made, only to prevent competition’ (Gualerni, 1976, p. 177).

The creation of IRI and foreign exchange policy

Another development, which was probably the most innovative policy of the entire Fascist period concerned the creation of the *Istituto per la Ricostruzione Industriale* (IRI) in 1933. It was created as a temporary institution, whose aim was to alleviate the balance sheets of the Italian mixed banks, weighed down by their frozen industrial stakes, following the aggressive purchase strategy pursued in the 1920s⁴². The

⁴⁰The same conclusion was reached by the contemporary economist Luigi Einaudi, then correspondent of *The Economist*. As he wrote at the time: ‘It appears that some people have asked for authorisations to start new plants, without any real intention of starting them, hoping instead that entrepreneurs already on the job would be willing to purchase those rights for the sake of avoiding competition’ (See Einaudi, 1934, p. 356).

⁴¹A large debate, fuelled by Gualerni himself, has discussed the reliability of these numbers. As Covino, Gallo and Mantovani (1976, p. 198) recall, the first figures on the number of authorizations were presented in ASI (1941) and covered the period until 31st December 1940. ISTAT (1946) then published the number of authorizations until 1941 and, for the first time, the number of authorized plants actually built. However in Del Buttero (1946), a publication by the *Ministero per la Costituente*, a much lower ratio of plants built to authorizations released was published, but was later defined ‘too strict’ by Gualerni (1976, p. 177), who, in turn, revised the numbers. Finally, Covino, Gallo and Mantovani (1976) presented numbers disaggregated by sector. Anyhow, all figures produced point to a low share of plants actually built.

⁴²Italy’s main mixed banks were Credito Italiano, Banca Commerciale Italiana and Banco di Roma.

financial troubles affecting these banks were ultimately threatening the solidity of the Bank of Italy, as the latter was exposed towards the banks for sums equivalent to 54% of the total circulation in place at the end of 1932 (De Mattia, 1967, p. 459). In order to definitively end the crisis and to reorganize the banking system, the regime opted for the creation of IRI⁴³. Having acquired the totality of the shareholdings in the three main mixed banks' portfolios, as well as the banks themselves, IRI came to directly control 21.5% of joint-stock companies's capital in Italy. Because of the chain-like nature of shareholding, IRI became the major shareholder in companies representing some 42% of all joint-stock capital in Italy (Zamagni, 1993a, p. 300).

Before the 1930s there had been episodes of the State acting as a lender of last resort of the banking system and, directly or indirectly, supporting industrial shares⁴⁴. However, in these occasions, the State had paid little interest in using these operations to pursue an independent industrial policy⁴⁵. As argued by Cohen, this was also the initial intention of the government when it created IRI⁴⁶. Yet, following the initial moves which were largely targeted at reducing its debt towards the Bank of

⁴³R.D.L. 23rd January 1933, n. 5.

⁴⁴Institutions such as the *Consorzio per Sovvenzioni su Valori Industriali* (CSVI), founded in 1914, and the Liquidation Institute (*Istituto di Liquidazioni*), created in 1926, financed by the State, organized and managed relevant bank bailouts in the 1920s (see, for example, Barbiellini Amidei and Giordano, 2011, p. 26). IRI actually absorbed the Liquidation Institute.

⁴⁵Furthermore, these previous interventions were generalised and concerned all industrial sectors with no particular sectoral bias. For example, Biscaini, Gnes and Roselli, when analysing the CSVI, claim that the Governor of the Bank of Italy, also head of the CSVI, 'never showed any sectoral "vocation" in the credit extension of the Consortium, neither initially nor in its later phase. Conversely, he emphasized, probably in order to avoid risk concentration, the need to commit to multiple industrial branches' (Biscaini, Gnes and Roselli, 1985, p. 157).

⁴⁶'IRI was not the logical fulfillment of a long-term plan but it was instead an emergency measure taken to avert an economic disaster' (Cohen, 1988, p. 106).

Italy, a new type of policy was pursued. Given the abolishment of mixed banks by the 1936 Banking Act⁴⁷, it became obvious that IRI could provide a key role in re-organising the industrial activity of the country⁴⁸. This action was aimed at supporting the whole of Italian industry, including small and medium enterprises, which were defined in an internal document as ‘the basis on which Italian industrial structure can be preserved and strengthened’⁴⁹. Its impact was to be long-lasting as, despite the initial intentions by the government, IRI was made permanent in 1937⁵⁰.

Despite the intent to support the whole of Italian industry, however, IRI invariably ended up having an immediate distortionary effect across sectors. The shareholdings acquired by IRI were, in fact, unequally distributed among sectors and largely included the more capital-intensive sectors, with which the former mixed banks had closer ties to⁵¹. These sectors, which were also those where the investment

⁴⁷As well as explicitly aiming at preventing banking instability, the Banking Act also opened up the way to an active direction of financial flows on behalf of the state towards selected sectors of the economy. The so-called “long-term liability” credit institutions, financed by state-guaranteed bonds, were the only banks allowed to extend long-term loans, as this activity was forbidden to “short-term liability” institutions. Via IRI, the guidance of these long-term credit institutions and the extension of subsidised credit, the state replaced the former mixed banks in allocating credit. Following the transformation of IRI into a permanent institute and the confirmation of the 1936 Banking Act by the *Assemblea Costituente* at the end of World War Two, Italy’s credit policy continued even after the demise of the Fascist government which had introduced it.

⁴⁸This aim was stated in the preamble of the decree which set up IRI. See Toniolo (1980, p. 245).

⁴⁹See an IRI memorandum quoted in Toniolo (1980, p. 267).

⁵⁰IRI Report of 6th May 1937, reported fully in Cianci (1977, pp. 362-371).

⁵¹‘To get an idea of its sphere of influence [...] IRI came to hold: 100% of the iron and steel war industry, of the artillery industry and of the coal-extraction industry; 90% of the naval industry; 80% of naval companies and of the locomotive industry; 40% of the iron and steel industry; 30% of the electricity industry; 20% cent of the rayon industry; 13% of the cotton industry’ (Toniolo 1980, p. 250). It also controlled the mechanical and armaments industries, telephone services, as well as the three ex-mixed banks. In all, IRI owned over 40% of the Italian shareholders’ capital, hence resulting the greatest holding company in Italy. IRI also grouped similar concerns under

of private capital was riskier and least likely to occur after the Great Depression (Tonio, 1980, p. 256), ended up benefitting largely from the *Istituto*.

Interestingly, IRI outlived the Fascist regime and became a key actor in Italy's Golden Age⁵². Following the confirmation of the 1936 Banking Act by the *Assemblea Costituente* at the end of World War Two, Italy's credit policy continued even after the demise of the Fascist government which had introduced it. IRI too was saved since it was widely recognized as not being an arm of the Fascist regime, but rather the product of a highly technical and committed braintrust which had used its experience in bank bailouts to reorganise Italy's financial system, and industrial sector as a result. The contribution of IRI to innovation and growth in Italy in the 1950s and 60s goes beyond, however, the scope of this paper.

Finally, to complete the picture, in the 1930s, as in many other countries hit by the Great Depression, controls on the foreign exchange were introduced, again with an asymmetric effect on Italy's different industrial sectors. In 1931, in fact, the Minister of Finance Antonio Mosconi, who had replaced Volpi, was given the power to issue measures regulating foreign exchange⁵³. Interestingly, Mosconi himself had abolished similar measures only the year before, in 1930, introduced by his predecessor. However, Mosconi used his new power only to dictate general guidelines

the control of new sub-holding companies: STET (1933) for telephone services, Finmare (1936) for shipping companies, Finsider (1937) for steel, Finmeccanica (1947) in the mechanical engineering sector, and Finelettrica (1952) in the electrical sector. IRI further enlarged its reach in the 1950s, obtaining an absolute majority of shares of RAI (the national broadcasting company) in 1952 and taking control over Alitalia (the national airline) in 1957' (Barbiellini Amidei and Giordano, 2011, p. 64).

⁵²See for example Pastorelli, 2006 and Antonelli, Barbiellini Amidei and Fassio 2012.

⁵³Royal legislative decree of 29 September 1931, no. 1207

to Italian banks, guidelines which however were not mandatory and which therefore were not enforced by many parties involved (Guarneri, 1953, p. 432). The next Finance Minister, Guido Jung, changed stance, and regulated foreign exchange heavily. For instance, operations in foreign currency were forbidden if they did not respond to the true needs of industry⁵⁴. Moreover, clearing agreements were drawn with Bulgaria, Romania and Germany⁵⁵. In 1935, the *Sovrintendenza agli scambi e alle valute* (Superintendence of exchanges and currencies) was created. Its aim was to coordinate the complex foreign exchange issues, but also to distribute the scarce means of payments to Italian importers according to the priorities dictated by the needs of the nation (Toniolo, 1980, p.281). This implied strict, but also discretionary, controls on imports. As the head of the Sovrintendenza Felice Guarneri later declared in 1939: ‘the distribution of imported raw materials is to be organised with the aim of insuring the manufacturing firms which export sufficient resources also for the internal market, putting them in a position of clear superiority relative to those firms that enjoy relying on the internal market’ (Guarneri 1939). This implied that import-dependent sectors, such as cotton, cited in Toniolo (1980, p. 275), were forced to export to survive, which often meant relying on dumping procedures given the international closure of those years. The controls on imports also led to corruption and speculation, hidden behind the golden propaganda of the Fascist regime (Toniolo 1980, pp. 286-7). Once again industrial policy was tailored so as to favour certain sectors, namely the modern ones, to the detriment of the other, traditional sectors.

⁵⁴Ministerial decree of 26 May 1934, no. 124.

⁵⁵See Guarneri, 1953, pp. 433-4, for details.

Overall, the account presented in this Section shows that Italian industrial policy underwent a significant shift after the decision to fix the exchange rate with the pound at *Quota 90*. Far from signalling continuity relative to the previous period, the years which followed were characterised by an innovative approach to industrial policy. This included a decisive attempt to tamper with competition in the product market which was followed by a new, more intrusive, state action through the newly created IRI and foreign exchange controls. These policies often affected the market in an asymmetric way, favouring newer industries at the expenses of the more traditional ones. Their impact was all more significant, as they came after an era of relative liberalisation, the age of De' Stefani, which had reversed at least some of the trends which had characterised the economy during World War One. Although the legislative evidence appears relatively strong to back-up our claims *a)* that any analysis of the evolution of labour productivity in Italian industry cannot treat the Fascist era as a homogenous period and *b)* that the relation between industrial policy and productivity ought to be tested empirically, it appears essential to provide evidence that the legislative changes occurring in the era did change the behaviour of Italian firms. As discussed in Chapter 1, the relationship between industrialists and the regime was, in fact, relatively complex with continuous games being played between the two actors (Sarti, 1971; Adler, 1995). Hence, it is possible that the propaganda by the regime masked a lack of application of its laws. Using the limited existing evidence and some newly constructed measures, Section 4.2.3 shows that the legislative changes in competition policy were truly matched by changes in various indicators of concentration in the economy. We also provide evidence that these

changes affected older and newer industries asymmetrically.

4.2.3 Measuring the effects of shifts in competition policy

The policy shift occurring as of the second half of the 1920s can be traced in a range of economic indicators showing changes in the level of competition in the industrial sector⁵⁶. This Section looks at two sets of indicators. The first one, presented in Section 4.2.3, is evidence on concentration indices. Although an imperfect proxy for competition, disaggregated data on concentration are available for a number of benchmarks over the 1911-1951 period. In order to complement these results, in Section 4.2.3 we present a second set of indicators, namely changes in prices and in the Cowling index. Although they are only available for a limited number of branches and years, these measures have the advantage of looking at the effects of anti-competitive behaviour rather than at one of the possible causes. As both indicators behave quite similarly in response to the main changes occurring over the period, we find strong evidence that the legislative changes outlined in the previous

⁵⁶This may have not necessarily been the case for the economy as a whole. In two distinct papers, Rossi and Toniolo (1992; 1993) calculated the aggregate mark-up in the Italian economy building on a model by Morrison (1992). In their 1992 paper, the two scholars assumed the presence of three factors of production (labour, imports and capital). Their estimates of market power over the period between 1922 and 1938 are high and volatile. They find that market power declines almost continuously between 1922 and 1929 (from 2.03 to 1.29), before rising between 1929 and 1932 (from 1.29 to 1.92). Surprisingly, this value then falls throughout the 1930s, reaching 1.40 in 1938. In the estimates presented in their 1993 paper, the scholars re-calculate the aggregate mark-up for an economy with five factors of production (labour, energy inputs, other imported inputs, private capital and public capital). In this case the level of the mark-up remains high but the volatility disappears (their estimate of market power is mostly bound between 1.65 and 1.75). In this case, the decline in market power is steady and happens almost continuously throughout the 1920s and 30s. Since this evidence refers to the economy as a whole rather than to the industrial sector, it does not contrast directly with our findings. Moreover, the results remain controversial (Federico, 1996, p. 781).

Section did have an impact on the behaviour of Italian firms.

The evidence on concentration

Studies on the evolution of concentration in Italian industry in the first half of the 20th century trace back to the pioneering work by two contemporary statisticians, Felice Vinci and Mario Saibante. In particular, using data on corporate capital and an aggregate Gini inequality index, Saibante found that concentration in industrial joint-stock companies stayed substantially stable between 1916 and 1926, only increasing from 78.80 to 80.82, before jumping to 88.92 in 1932 (Saibante, 1934)⁵⁷. This would suggest that there was a sudden acceleration in the concentration of the Italian industrial structure after *Quota 90*. However, this evidence is of limited use as it does not allow one to explore the evolution of concentration in the different industrial branches. This was done by a later economist, Profumieri, who in the 1970s calculated the proportion of share capital which was controlled by the largest firm in a number of sectors for 1938 using data taken from an extensive study carried out in the *Rapporto della Commissione Economica all'Assemblea Costituente* (Ministero per la Costituente, 1948, pp. 289-300). His results⁵⁸ led him to conclude that, in the 1930s, 'there is much evidence that the reorganization and concentration of share and financial capital went along with state intervention' (Profumieri, 1972, p. 684). Notwithstanding the limited size of this dataset, this study also confirms that the policies we outlined in the previous Section did have a relevant impact on the market

⁵⁷This study builds on the earlier work by Vinci (1918) and Saibante (1926).

⁵⁸He found the C1 ratio to be: 100% for tyres, 70% for phone cables, 100% for rayon, 75% for chemical fertilisers, 83% for cars, 65% for artificial fibres and 45% for electricity. See Profumieri (1972, p. 684).

structure of Italian industry.

A more comprehensive dataset, looking at broader indicators than Profumieri's C1 ratios, is the one on the evolution of concentration in the corporate capital-base⁵⁹ put together more recently by Giannetti and Vasta (2006)⁶⁰. The two scholars calculated the C4 index⁶¹ of assets of listed manufacturing firms⁶². The firms considered were those present in the *Imita.db*⁶³ dataset over seven benchmark years for the period 1913-1971⁶⁴. They define as *competitive* a sector whose C4 index is below 40%, *semi-competitive* if its value is between 40% and 59% and *monopolistic* if the index is above this last threshold. The scholars present both their raw results and those adjusted for the role of groups, that is consolidating assets for those firms re-

⁵⁹This is an imperfect indicator. Ideally, one would like to base the calculation on value added or production of the considered firms. However, this evidence is not available.

⁶⁰This work builds on a previous paper by Giannetti, Federico and Toninelli (1994).

⁶¹C4 is the percentage quota of the observed variable (in this case, assets) for the four largest firms. The authors also constructed a Herfindhal index, which was strongly correlated (0.85) with their preferred indicator (Giannetti and Vasta, 2006, p. 51).

⁶²The fact that the database only takes into account listed firms could potentially bias the results. Giannetti, Federico and Toninelli (1994) effectively rebutted this criticism, underlining how the selection of firms subjects the dataset to two contrasting biases. On the one hand, the database understates concentration because it ignores the role played by cartels. On the other, however, it overstates it, as multisectoral firms are counted only once and because it ignores the presence of firms which either were too small or were not joint stock.

⁶³IMITA.db (IMprese ITALiane Data Base) is the historical archive of the Italian joint stock companies. It represents the digital version of a serial source based on a collection of published volumes, edited from 1908 to 1926 by the Credito Italiano, and then from 1928 by the association of Italian joint-stock companies, the *Associazione fra le società italiane per azioni* (Asipa). This source includes all the joint-stock companies listed in at least one of the Italian stock markets, together with all those companies based in Italy, which in their last balance sheet reported capital higher than a given threshold, which was fixed at different levels in different years. The database includes information on individual companies and on boards' members, for the period between 1900 and 1983.

⁶⁴The years were chosen to be close to the years of the industrial censuses (Giannetti and Vasta, 2006, p. 52).

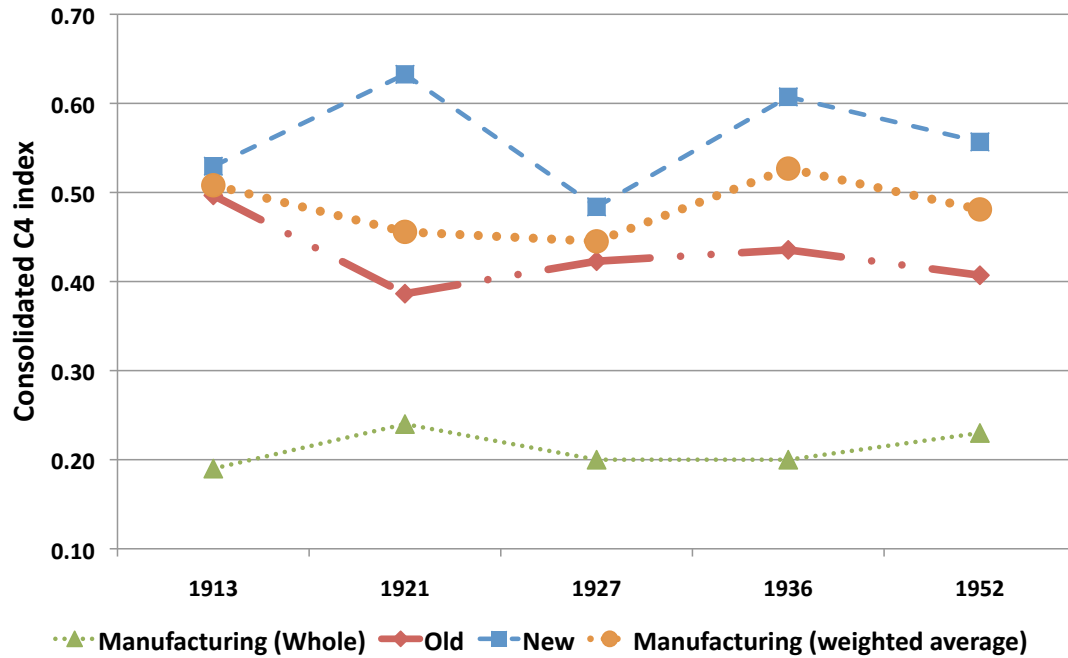


Figure 4.2: Consolidated C4 ratios in manufacturing, 1913-1952
Sources: Giannetti and Vasta (2006) and our elaborations on their data

ciprocally linked by interlocking directorates. Since we find the latter measure to be more interesting for our study, we only present Giannetti and Vasta’s ‘consolidated’ C4 index for manufacturing in Figure 4.2. The Figure looks at the five benchmarks which are most relevant for our work, namely 1913, 1921, 1927, 1936 and 1952.

Giannetti and Vasta’s consolidated index shows little change over the five benchmarks which are most relevant to this study. Despite being relatively small, the changes occurring in between 1913 and 1927 are consistent with what we expect from the historical narrative. Concentration rose over the war, before declining between 1921 and 1927. Conversely, there seems to be no change in the C4 index between

1927 and 1936 and only a small change between 1936 and 1952. Such results would suggest that the liberal phase of Fascism was only able to return concentration levels in the manufacturing sector to those registered in the pre-World War One era and that there was practically no “regime break” in the Fascist years. Furthermore, manufacturing results as a “competitive” sector throughout.

However, drawing such conclusions from this piece of evidence appears quite rushed. The indicator presented by Giannetti and Vasta appears of little use for those interested in the level of competition within Italian manufacturing. By calculating a C4 index for manufacturing as a whole, Giannetti and Vasta in fact analyse a market which is too broadly defined and therefore dilutes the resulting concentration measures. For this reason, Figure 4.2 also shows a different aggregate indicator which we have calculated weighting the concentration ratios for each branch (available in Giannetti and Vasta, 2006) by branch-specific value added at current prices⁶⁵. This new indicator behaves differently from Giannetti and Vasta’s. The level of concentration between 1913 and 1927 was roughly stable, with the period of liberal Fascism being characterised by a gentle decrease in concentration. The second phase of the Fascist era was, conversely, characterised by a rise of our indicator from 0.47 (semi-competitive) to 0.56 (nearly monopolistic) in just under ten years, providing some useful support to the theory that the new policy regime introduced as of 1926-7 did have a significant effect on concentration in the product market.

⁶⁵For the years 1913, 1921, 1927 and 1936, we employ data from Carreras and Felice (2010). For the year 1952, we employ data relative to 1951, taken from Fenoaltea and Bardini (2000b).

Our further elaborations on Giannetti and Vasta's data, which divide the industrial sector into new and old industries⁶⁶, and which are also presented in Figure 4.2, shed some light on the heterogeneous performance of the different branches of Italian manufacturing. Generally speaking, concentration was quite high in both groups⁶⁷. The old industries were characterised by falling concentration between 1913 and 1921 and by a relatively stable C4 ratio thereafter. Conversely, between 1913 and 1952, concentration increased quite substantially in the newer industries. For these industries, changes in the individual sub-periods were rather dramatic. Concentration rose fast during World War One, and then fell below 1913 levels during the era of liberal Fascism. Conversely, the 1930s saw a fast acceleration in the process of consolidation in the new industries, as our indicator rises by 0.12 in less than 10 years. In particular, the C4 ratio for the coke and petroleum products industry rose by 0.22, while the one for chemicals and chemical products by 0.13. These results contrast with what happened over the same period to the textiles, textile products and leather industries, where the C4 ratio fell⁶⁸. Overall, these findings suggest that the new industries underwent the most dramatic changes in concentration, and that these changes closely map the historical narrative we have outlined in the previous Section. Conversely, the regime changes we have identified over the period were less felt in the old industries.

⁶⁶For a description of this classification, please refer to Section 4.3.2.

⁶⁷This is confirmed by Giannetti and Vasta (2006). Using the consolidated C4 ratio, 'competitive sectors diminish greatly, while the monopolistic sectors prevail; amongst these we find both those sectors linked to the technological regime of the second industrial revolution, as also the majority of the traditional sectors' (Giannetti and Vasta, 2007, p. 61).

⁶⁸This is based on our elaborations, here not shown.

Prices and Cowling indices

The concentration data presented in Section 4.2.3 provide some initial evidence that the level of product-market competition responded to the policy changes introduced over the period and that these changes were particularly dramatic for the new industries. However, concentration may not be indicative of what is happening to the level of competition in a given product market. Although a high concentration ratio can favour the establishment of an anticompetitive environment, there is no monotonic relation between the number of firms in a sector, or the concentration of production, and the level of competition⁶⁹. Therefore, it is useful to look at the pricing behaviour of firms to understand whether increased concentration was also accompanied by reduced competition.

Unfortunately, evidence on the pricing behaviour of firms is more piecemeal than the one on concentration⁷⁰. Some evidence is however presented in a recent study by Giordano, Piga and Trovato (2011). Similarly to Cole and Ohanian (2004), who analysed the US manufacturing sector, Giordano, Piga and Trovato (2011) measured the relative prices of a selection of goods produced by cartels in Italy for the period 1932-8, after the introduction of the law on *consorzi obbligatori*, mentioned in Section

⁶⁹The standard Bertrand (1883) model shows that, under stringent assumptions, the presence of only two firms in a market can result in competitive pricing. The theory of contestable markets, first presented by Baumol (1982), has shown that the threat of entry can be sufficiently severe to induce a reduction in the mark-up even in a monopolistic market. Conversely, although collusive agreements are harder to sustain in the presence of a large number of firms, a market with many firms can be characterised by super-normal profits in presence of a cartel.

⁷⁰'Despite the importance which some attribute to the measures aiming at regulating competition, it is impossible to evaluate quantitatively their relevance in slowing down the fall of the prices of industrial products' (Toniolo, 1980, p. 163).

4.2.2. The ratio is computed with respect to a private services deflator, where private services represent one of the few not-cartelised sectors in the 1930s. Their main finding is that the relative prices of cartelised goods rose after 1932, and remained high throughout the 1930s. Their conclusion is that, ‘even if the Fascist cartels rarely included all the firms of an industry, they seem to have been effective in reducing competition and raising the prices of goods (Giordano, Piga and Trovato, 2011, p. 15).

The problem with this type of evidence is two-fold. Firstly, because of data limitations, Giordano, Piga and Trovato (2011) cannot offer a systematic view of all sectors of Italian industry and have to limit their analysis to selected products. Secondly, the evidence they present can be misleading in the case of processed goods. In this case, rather than being a consequence of the establishment or of the improvement in the functioning of a cartel, their result may be due to changes in the prices of inputs, not necessarily due to the presence of other cartels, which could have driven up the prices of final output⁷¹.

In order to avoid the problems related to the comovement of inputs and output prices, one possible approach is to calculate branch-specific price-cost margins, through the so-called Cowling index. For branch i , this means calculating $(VA_i - w_i L_i)/VA_i$, where VA is value added and wL is the wage bill (Cowling, 1982)⁷². This indicator has been used extensively in the international literature, as

⁷¹In Giordano, Piga and Trovato (2011)’s sample of products, two are in fact processed goods.

⁷²Broadberry and Crafts (1992) use this measure in their analysis of the impact of cartelisation

it has the advantage of looking at the *effects* of competition rather than at the possible *causes*⁷³.

The calculation of price-cost margins in the Italian case is not straightforward, as information on ‘value added’ and on ‘wage bills’ only began to appear in the official statistics in the 1937-9 industrial census. However, thanks to the recent effort in the reconstruction of the Italian national accounts, branch-specific data on value added at current prices are now available in the literature. Conversely, calculating the wage bill is less straight-forward and requires using a wide range of sources. Data on payroll is only available for the 1937-9 and 1951 industrial censuses and, even in these cases, because of the incomplete coverage of the industrial censuses⁷⁴, they only refer to a fraction of Italian workers. To make these figures comparable with the available evidence for value added, which refer to the whole of the Italian working population, we combine information from the relevant industrial censuses with data from the population censuses. This procedure is also applied to the pre-1938 datapoints, where a range of independent sources is employed to obtain data on hourly and daily

on productivity growth in Britain in the 1930s. Alexander (1994) uses a slightly modified version in order to examine the effects of the National Industrial Recovery Act in the US. One must be aware, however, that a potential problem with the price-cost margins estimated through the Cowling index is that they inappropriately include in the supernormal profits the return on capital. Data limitations are however such that this issue cannot be tackled.

⁷³This is also the case of the indicator used in Giordano, Piga and Trovato (2011). Another recently developed measure of the effects of competition is the profit elasticity (Boone and van Leuvensteijn, 2010), which measures the percentage fall in a firm’s profits in response to a 1% fall in the firm’s efficiency. The more competitive the environment, the bigger the fall in profits due to a given loss in efficiency. The data required to compute this measure are profits and marginal costs, which, however, are not available for Italy in the period under study. Hence this type of indicator has not been explored in this paper.

⁷⁴For more details, see Section 4.3.2.

wages and on the number of hours worked⁷⁵. The main point to be made here is that this procedure only allows us to calculate Cowling indices for four benchmark years, namely 1911, 1927, 1938 and 1951, instead of the five benchmarks available in the analysis of concentration ratios. The absence of an industrial census between the years 1911 and 1927 prevents us from constructing a post-World War One benchmark, which would be useful to distinguish between the war and the De' Stefani era⁷⁶.

Figure 4.3 shows the Cowling index for the benchmark years 1911, 1927, 1938 and 1951. We present data for the whole of industry⁷⁷, for manufacturing⁷⁸, and for old and new industries. All the indicators represent weighted averages, which are calculated multiplying the price-cost margin of each branch by weights based on the value added generated in that year. This figure shows that there was a significant difference in the behaviour of the product market between, respectively, 1911 and 1927, and 1927 and 1938. In industry as a whole, price-cost margins stayed roughly stable between 1911 and 1927, before rising substantially in the second period. This increase is then followed by a fall in the margins which characterised the 1938-1951 period, showing that the experience of the post-World War Two era was different from what occurred in the 1930s.

⁷⁵Full details of how the estimates are obtained are provided in Appendix 4.A to which we refer.

⁷⁶This will also be the reason why, in our econometric exercise performed in Section 4.4.2, we prefer to rely on concentration ratios rather than on the Cowling indices.

⁷⁷As in the later Sections of this work, we prefer to drop construction, a sector whose behaviour is deemed to be excessively cyclical to produce meaningful results in this type of study.

⁷⁸We plot data referring to manufacturing only to allow comparability with the data on C4 presented in Figure 4.2, which refer to manufacturing only.

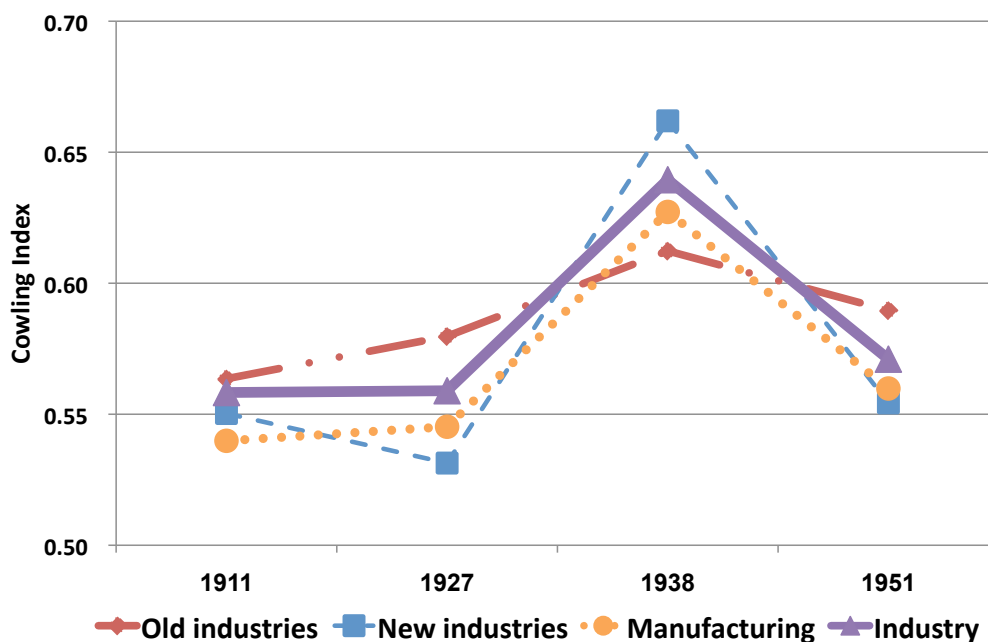


Figure 4.3: Cowling Index for Italian industry and manufacturing, 1911-1951
Sources: see text

Generally speaking, the trends observed in industry as a whole are confirmed by the data relative to manufacturing, which allow a more direct comparison with what was happening to concentration ratios supplied in the previous Section. Although it is not possible to say how the two measures relate over the 1911-1927 period because of the lack of a post-World War One benchmark, for the other periods the movements of the aggregate price cost margins tend to mirror those of the aggregate concentration ratio. In both cases, a significant break is present after 1927, proving that the second phase of Fascism made Italian industry much less competitive.

When we look at the different behaviour of the price cost margins for the new and

old industries, just as in the case of the concentration ratios, we can appreciate some significant differences between the two categories. In the case of old industries, price-cost margins rose gently in both 1911-1927 and in 1927-1938, before falling, again, quite mildly, between 1938 and 1951. These changes contrast vividly with those occurring among new industries. In this case, the period between 1911 and 1927 is marked by slightly falling price-cost margins, which then rose very fast in the 1930s, before falling in the 1940s. These results confirm the view that the anticompetitive shift occurring in the 1930s was largely driven by what occurred in the new industries.

Overall, the evidence on concentration ratios and on the pricing behaviour of firms shows that the legislative changes occurring between 1911 and 1951 did have an effect on the behaviour of agents in the product market. The era of liberal Fascism marked a shift from the war economy which was then reversed throughout the 1930s, when product market competition was severely limited, largely because of what occurred in the new industries. This analysis fully justifies our decision to analyse productivity growth in Italian industry over the period using a larger set of benchmarks than done in previous work, something which we spell out in Section 4.3. It also justifies our decision to assess whether these changes had a positive or a negative impact on productivity growth, a task which we undertake in Section 4.4.

4.3 Labour productivity growth dynamics and structural change

This Section examines the evolution of labour productivity growth in Italian industry, during its different phases and within its component sectors, between 1911 and 1951. Building on a new dataset described in Section 4.3.1, in Section 4.3.2 we present crude figures on the growth rates of output per worker in key sub-periods, whereas in Section 4.3.3 we attempt to refine our results in order to account for changes in the number of hours worked. What clearly captures our attention is the different growth rates registered in the two phases of Fascism, as well as the heterogeneous performance of new and old industries. In both sections, we complete our analysis by decomposing, via shift-share techniques, our estimated productivity growth rates, so as to disentangle the effects of internal productivity growth and of shifts of labour resources from low-level productivity sectors to high-level productivity ones.

4.3.1 Output per worker: data

In order to analyse the patterns in Italian industrial labour productivity growth, many issues concerning the data available have to be first tackled. Value added estimates for the period under study were heavily unreliable until the most recent past. Official ISTAT (1957) and semi-official ISTAT (Fuà, 1978) data, constructed on the basis of dubious, or simply not described methodologies, were found to suspiciously amplify Italy's industrial growth during World War One, which thus led Italy to outperform all other European belligerent countries (Broadberry, 2005), and

to underestimate the impact of the Great Depression on Italian industry (Giugliano, 2011a). In general, the extant 1911-1951 data were unanimously deemed highly unsatisfactory for economic analysis.

Very recently, Carreras and Felice have produced new annual estimates of Italy's industrial VA for the period 1911-1951 (Carreras and Felice, 2010 and Felice, 2011) which have overcome the flaws in the previous series. Chapter 2 of this thesis has in turn revised some of the underlying elementary series, thus providing even more refined estimates for the decade 1929-38. Given the too short a time-span of these estimates, for the present paper Carreras and Felice's VA estimates are used. A brief description of Carreras and Felice (2010) and Felice (2011) data may be found in Appendix 4.A to which we refer.

If the existing VA series present some problems, the choice of the labour input data is even more controversial. For the headcount of labourers, two possible sources exist: industrial census (IC) or population census (PC) data⁷⁹. Not all the mentioned censuses, however, have the same degree of reliability. For example, the 1921 PC figures were revised at the next census date, in 1931, due to recognized irregularities in the data-collection process (Vitali 1970, p. 272). Similarly, the 1937-9 IC is problematic in that it was taken over three years, so as to measure each industrial branch when it was working at full capacity (Chiaventi, 1987, p. 131). Furthermore, IC data are known to underestimate the labour input as they exclude seasonal and part-time

⁷⁹For those not familiar with Italian censuses, ICs were taken in 1911, 1927, 1937-9 and 1951, in the period considered, whereas PCs date back to 1911, 1921, 1931, 1936 and 1951.

work and cottage industry; PCs on the other hand, by measuring the labour force, are known to overrate employment, since they also count in seasonal workers and (temporarily) unemployed. All things equal, the use of ICs as labour input increases the labour productivity estimate at a given date, whereas the use of PCs brings the estimate down⁸⁰.

These measurement issues are not unknown to other countries, yet in Italy a particularly heated debate concerning the correct measure of employment to be adopted is still ongoing. Just to mention a recent example, when constructing Italy's regional estimates of industrial production for the period 1861-1913, Fenoaltea vouched for PC figures (e.g. Fenoaltea, 2003b, p. 1061), after having criticized Zamagni's use of the 1911 IC in Zamagni (1978a). Felice (2005, p. 5) diplomatically opts for an intermediate solution, assuming that the workers counted in the PC but not in the IC had half the productivity of those who were both in the PC and in the IC. Finally, in their estimates of labour productivity, Broadberry, Giordano and Zollino (2011) in some sense sidestep the issue, by using PC data as an upper-bound estimate of labour in Italy and the IC as a lower-bound in the period 1861-1951, with the "true" value falling somewhere in between⁸¹.

⁸⁰It is noteworthy that the difference between the two census-based estimates decreases significantly over time (Zamagni, 1987, p. 44).

⁸¹Recall, however, that Broadberry, Giordano and Zollino (2011) examine productivity trends in the overall Italian economy from 1861 through to 2010. PC data are therefore necessary to cover the first fifty years of Italian history, as well as to gain information on the agricultural and services sectors which are not covered by the ICs. Refer to the Data Appendix in Broadberry, Giordano and Zollino (2011) for more details concerning historical labour data sources and connected issues.

In this paper we mainly rely on PC figures due to consistency issues: the VA estimates at constant prices used in this paper are constructed assuming that the working population was the one counted in the PCs rather than in the ICs. Sources and methodology are explained in detail in the above-mentioned Appendix 4.A; here we only provide the general gist of our choices and elaborations. Our benchmark years, subject to data availability as well as to the purposes of our analysis, are: 1911, 1921, 1927, 1938 and 1951. The starting and ending years (1911 and 1951) coincide with the two years in which both population and industrial censuses were taken. For both years we use PC data as revised by Vitali (1970), with minor exceptions for a couple of branches in 1911. In order to isolate the World War One years from the rest of the period, the 1921 PC turns out to be crucial. Although the latter census is not the most reliable⁸², it has been used in other studies (e.g. Zamagni, 1987) and was deemed too precious for our analysis to be discarded. Next, so as to highlight the switch in Fascist industrial policy stance as well as the Great Depression years and Italy's subsequent recovery, the two benchmark years supplied by IC data, respectively 1927 and 1938, are ideal. Yet switching to IC data for these two years would jeopardize our estimates. In order to construct a hypothetical PC figure for 1927 we follow a procedure which is roughly analogous to the one employed by Fenoaltea and Bardini (2000a) for 1938⁸³, that is we retropolate the PC figure revised by Vitali (1970) for 1931 to 1927 using a range of branch-specific production series,

⁸²The 1921 PC suffered from a range of irregularities, which were particularly acute in the Southern regions and which led to an overestimation of the population. The data we employ are anyhow those from Vitali (1970), who made a number of correction to solve this problem. For details, see Vitali (1970, pp. 272-84).

⁸³See in particular Bardini and Fenoaltea (2000a, pp. 181-4).

taken from Carreras and Felice (2011). Finally, for 1938, we again adopt Fenoaltea and Bardini's (2000a) estimation procedure pushing forward the 1936 PC figures to 1938. For those branches in which yearly production indices were not available, we employed data on employment coming from a range of other sources, including the *Bollettino di Notizie Economiche* from Assonime⁸⁴ and Banca d'Italia (1938).

Finally, before presenting our labour productivity estimates, a brief description of the industrial sectors analysed may be of use. Compared to Bardini (1998), we expand our viewpoint by considering not only manufacturing, but also mining and utilities since they too present interesting productivity growth patterns in the period under study⁸⁵. Manufacturing is then further disaggregated as in Fenoaltea and Bardini (2000a, p.116) at a two-digit level. Furthermore, a special effort was made to disaggregate the textile industry (woollen and worsted; cotton weaving and spinning; other textiles; silk and artificial textiles), in that whereas the former branches belong to Italy's 'old industries', artificial textiles are new⁸⁶. It was unfortunately not pos-

⁸⁴This source includes the results of the statistical survey run by Confindustria, in agreement with ISTAT and the *Ispettorato dell'Industria e del Lavoro*.

⁸⁵As stated in footnote 77, we choose to exclude construction because of their strongly cyclical nature. "Other industries" are also dropped from the sample as what is included in this residual category changes over time.

⁸⁶Unfortunately, it is not possible to separate silk from artificial textiles, owing to the fact that they are combined in the 1937-9 IC. This is problematic (but unavoidable given our data sources) since silk was a traditional, labour-intensive and competitive industry, tied to agriculture and export-oriented (Federico and Ishii, 2001). Federico and Wolf (2011, p.8), by arguing that most of silk's value consisted in cocoons, a purely agricultural raw material, and since the processing of cocoons settled close to the production areas, actually push the argument even further, and classify silk as an agricultural product until 1939. Conversely artificial textiles were a much more recent and modern industry. Given the impossibility of separating silk from artificial textiles, we have decided to assign them both to the new industries since, in the period under study (1911-1951), the latter passed from virtually no production to an estimated value added of 13,664 million lire in 1951 (Fenoaltea and Bardini, 2000b, p. 230). The sensitivity of our overall results to the inclusion

sible to disaggregate the mechanical engineering industry, which similarly includes new and old branches. Estimates of value added for this branch are based on the apparent consumption of raw material and this type of data cannot be separated among its different products⁸⁷. The industrial sectors thus identified and listed in Table 4.2 were then grouped into new and old industries⁸⁸.

4.3.2 Output per worker: results

Figure 4.4 presents employment shares in our chosen benchmark years, divided into ‘new’ and ‘old’ industries. We see new industries monotonically increasing from 26% in 1911 to 42% in 1951. Conversely, the share of old industries drops from 74% to 58%. As for the different periods, the era between 1911 and 1927 was the one in which Italian industry modernised fastest. More than half of the shift of employment from old industries to new industries occurred in this particular period.

Figure 4.5 computes average annual labour productivity growth rates in Italian industry, in four key sub-periods. Between 1911 and 1927 (figures here not shown), yearly labour productivity growth (1.4%) was just below the average for the overall

or exclusion of the silk/artificial fibres sectors in new industries is, anyhow, minimal.

⁸⁷On the problems associated with disaggregating the mechanical engineering sector, also see Tattara and Toniolo (1976, pp. 145-6).

⁸⁸This classification mirrors the one reported in Richardson (1967) and may also be found in von Tunzelmann (1982, p. 30) and Broadberry and Crafts (1992). Federico (2003, p. 44) has criticised the use of a new/old classification on the grounds that it may change over time. However, this criticism is also applicable to the distinction between heavy and light industries which he favours. Anyhow, we do not expect a heavy/light classification to yield substantially different results. Tattara and Toniolo (1976, p. 148) in fact apply it for the period 1927-1937 and what they include in their categories roughly matches our choices. We prefer to classify branches according to the old/new divide also to be free to employ a new/old dummy alongside the different degree of capital intensity in our econometric model presented in Section 4.4.2.

	Old	New
Mining	✓	
Food	✓	
Tobacco	✓	
Silk and artificial textiles		✓
Cotton	✓	
Wool	✓	
Other textiles	✓	
Clothing and leather	✓	
Timber and furniture	✓	
Paper		✓
Printing		✓
Photography and cinema		✓
Metalmaking		✓
Engineering		✓
Non metallic minerals	✓	
Chemicals		✓
Rubber		✓
Utilities		✓

Table 4.2: Taxonomy of the different sectors of Italian industry
Sources: see text and Appendix 4.A

period (1.7%). Yet the former average growth rate is biased by the potentially distortive effect of World War One on Italy’s productivity performance. This “World War One critique”, that one can advance relative to the aforementioned study by Bardini (1998), loses significance if we introduce our 1921 benchmark year, as we do in Figure 4.5. The latter shows that the performance in 1911-1927 was extremely heterogeneous. Productivity growth during World War One halted, with rates close to zero being experienced. Conversely, the 1920s were years of booming productivity in all sectors: growth rates rose to 3.6% in the overall industrial sector. These were

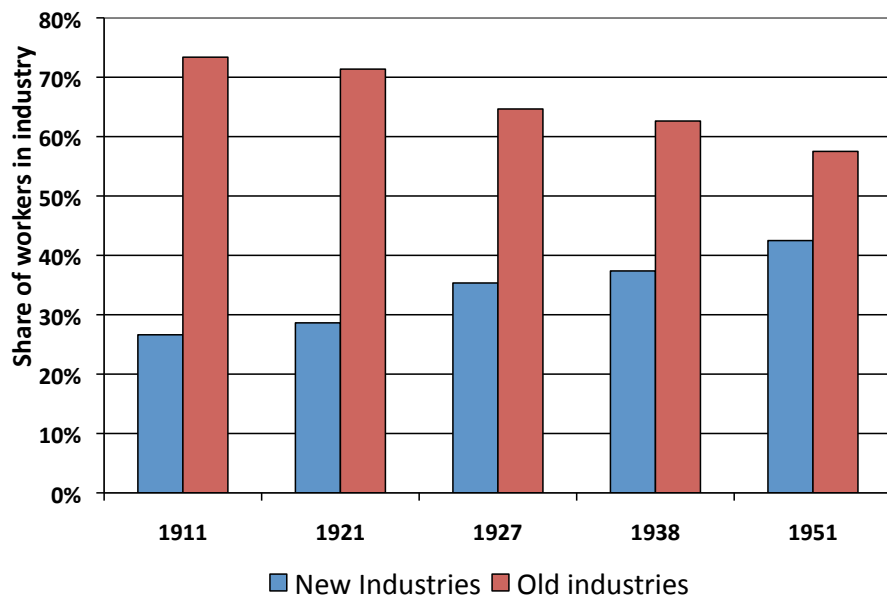


Figure 4.4: Employment shares in Italian industry, 1911-1951
Sources: see Appendix 4.A

the years of fastest growth in the overall period. When compared to the “roaring Twenties”, the performance of the 1930s appears very feeble, with labour productivity growth averaging around 0.9% per year and hence dropping to a quarter of previous growth rates. In the 1940s output per worker growth rates picked up again, but averaged 2.2% per year⁸⁹.

⁸⁹The period 1938–1951 is extremely heterogeneous, as it encompasses both World War Two and the early post-World War Two phase. It is therefore hard to pin-point what can explain the 2.2% per year rate of growth which we observed in our data. Generally, changes in labour productivity growth can be driven both by changes in the capital stock and by an increase in total factor productivity. We concentrate on the former and on how World War Two might have affected Italy’s capital stock. If the capital stock of a country is destroyed by a war, this destruction can lead to a fall in output. Were the labour input to remain constant, the destruction of the capital stock could lead to a fall in productivity growth. The increase in capital stock, output and labour productivity occurring in the reconstruction phase will compensate for the initial fall and may not

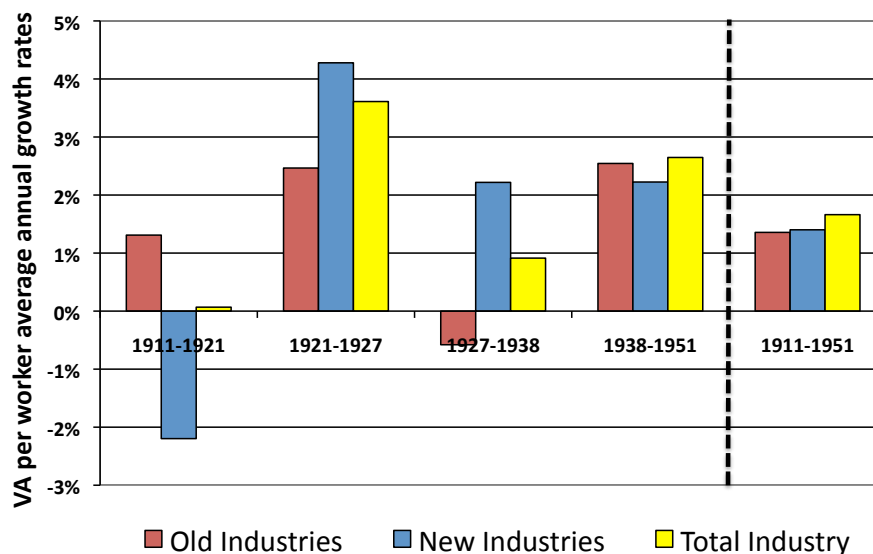


Figure 4.5: Labour productivity growth in Italian industry, 1911-1951 (in %, per annum)

Sources: see text and Appendix 4.A

We then analyse differential growth rates in the old and new sectors. Over the whole period 1911-1951 old and new industries' labour productivity tended to grow

result in fast labour productivity growth such as the one we observe in our data. However, Italy did not suffer from large destruction of the capital stock during World War Two. De Cecco and Giavazzi (1993) have emphasised how 'the bulk of Italian industry survived the war largely intact'. Rossi and Toniolo (1996, pp. 438-9) have claimed that, while social overhead capital, particularly in the Centre-North, might have suffered more substantial damages than industrial equipment, 'its repair [...] required mostly pick and shovel work, then an abundant factor in Italy, and could be easily carried out'. As the capital stock suffered relatively little during the war, the process of capital accumulation which happened in the post-World War Two phase might have led to actual capital deepening compared to 1938 levels, rather than simple reconstruction of the stock which existed prior to the war. This may explain the 2.2% growth rate per year which we observe in our data.

at similar annual rates. This is consistent with the hypothesis by Tattara and Toniolo, by us referred to in Section 4.1, that the differences in levels present at the time between new and old industries may not have translated into large productivity growth differentials (Tattara and Toniolo, 1976, p. 150). However, breaking down the period, striking differences appear. In the decade 1911-1921 new industries were a strong drag on overall productivity growth. This result may appear surprising in light of our earlier discussion on the decision by the government to direct its industrial policy towards the promotion of new industries. Yet, it reflects the fact that the increase in resources devoted to these sectors did not necessarily translate into a proportional increase in output. The main problem faced by the Italian economy was the haste with which it had to accelerate production in these sectors. As remarked by the contemporary liberal economist Attilio Cabiati, ‘the speed at which new huge plants were created, existing ones were expanded, blast furnaces were built [...] workers were turned into technicians, companies were concentrated and cartelised both horizontally and vertically was a liability for the economy and for firms’ organisation’ (Cabiati, 1920, p. 10)⁹⁰. These limits, which were not foreign to larger groups⁹¹, affected severely small firms which had expanded rapidly as a result of the war. One such example is that of the aircraft manufacturer Caproni, which, in spite of a fast rising number of employees, was incapable of meeting the promised output targets. This was largely because of its lack of a ‘real industrial management of its

⁹⁰Also see the remarks by another contemporary commentator, the engineer Giuseppe Belluzzo, who also commented on the amount of disorganisation and incompetence present in Italian industry over the period (see Caracciolo, 1978b, p. 244).

⁹¹To only give one example, the quality of the weapons built by the Ansaldo group was severely questioned by the army towards the end of the war. See Caracciolo (1978b, p. 234).

workforce’, which was noticed in a range of inspections by army officers and which Caracciolo again attributes to its ‘hasty growth and to its desire to speculate’ from the war effort (Caracciolo, 1978b, p. 238).

Despite the problems associated with rapid industrialisation, the war did contribute to the transformation in the structure of production. The contemporary statistician Corrado Gini (1921) emphasised the importance of learning-by-doing approaches, while the commentator Riccardo Bachi (1921) emphasized the relevance of the Taylor system of production which was slowly adopted throughout the war. Such factors can help to explain why, after the war, the new industries experienced a real productivity boom. As shown in Figure 4.5, throughout the 1920s, their growth rates were well above those of the old industries, peaking at 4.3%. The pace of this growth was, however, halted in the 1930s, when new industries held the fort, but registered halved annual growth rates relative to the preceding decade. In the last sub-period the old industries bounced back to their 1920s average annual growth rates, outperforming the stable new industries⁹².

Overall productivity growth rates can also be additively decomposed, via a shift-share analysis, as the sum of internal productivity growth rates and the effect of structural change, i.e. shifts of resources from low-level productivity sectors to high-

⁹²The finding that old industries did better than new ones across World War Two mirrors the results found by Vonyó (2011) for the German case. Vonyó attributes it to the fact that the increase in resources devoted to the new sectors did not necessarily translate into a proportional increase in output. Workers relocated to these sectors during the war effort were not as productive as those who had been working there in peacetime.

level productivity sectors. In particular, we are interested in searching for evidence of the effect of a disengagement of labour from the old industries in favour of the new ones. The basic approach is derived from Nordhaus (1972), which allows us to break down the overall productivity growth of Italian industry into its two structural components:

$$\frac{\hat{X}_T}{X_T} = \sum_{i \in N, O} \frac{\hat{X}_i}{X_i} \times \frac{VA_i}{VA_T} + \sum_{i \in N, O} \frac{VA_i}{VA_0} \times \left(\frac{\hat{L}_i}{L_i} - \frac{\hat{L}_T}{L_T} \right) \quad (4.1)$$

Where: X_i is labour productivity growth in sector i , VA_i is the value added in sector i , L_i is employment in sector i and i can take two values (O , if the sectors are old, N if the sectors are new)⁹³. The first term on the right hand side of equation 4.1 is the “direct productivity effect” (Stiroh, 2002), or “intensity effect” (Salter, 1966), or “within effect” (Antonelli and Barbiellini Amidei, 2007). It is a weighted average of the productivity growth rates in component sectors, where the weights are base year nominal value-added shares of each sector and it indirectly reflects technical improvement within industries. The second term is the “shift effect” (Salter, 1966) or “reallocation effect” (Stiroh, 2002), which captures the effect of shifts in resource allocations within the industrial sector on aggregate productivity.

We apply this decomposition to the overall growth rates presented in Figure 4.6⁹⁴. This figure shows how structural change, with old industries releasing labour to the advantage of new industries, was, in relative terms, dominant in the period 1911-

⁹³The “hat” symbol denotes time derivatives.

⁹⁴Following Stiroh (2002), the value-added shares are computed as average two-period sectoral value added shares.

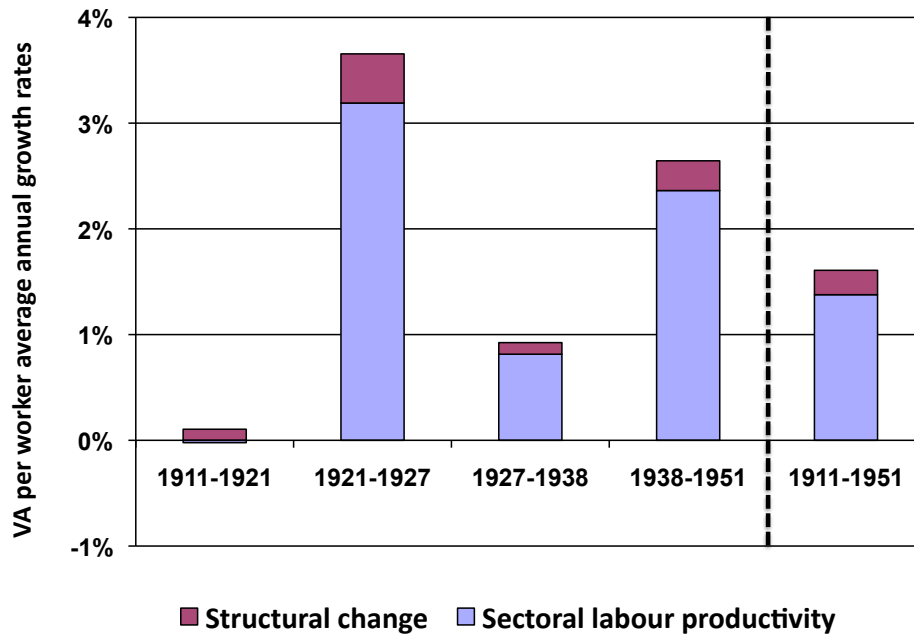


Figure 4.6: Structural components of Italy's industrial labour productivity, 1911-1951

Sources: see text and Appendix 4.A

1921, when productivity gained from switching to the new industries were high and sufficient to offset negative internal productivity growth. This finding is consistent with the account of World War One given by Caracciolo (1978b), who emphasised the role of structural change in the war economy⁹⁵. The contribution of structural change to growth was instead quite small in the other decades, accounting on average for only 12% of overall growth in the remaining sub-periods. Sectoral productivity growth was hence the main driver of overall industrial productivity growth in Italy

⁹⁵ 'The exceptional importance of the war in moving resources towards the more modern and dynamic sectors appears now to be well-established' (Caracciolo, 1978b, p. 246).

in the period 1911-1951⁹⁶.

To sum up, in this section we have seen how average annual labour productivity growth rates for new and old industries in the overall period 1911-1951 miss out completely on a heterogeneous performance of the two groups in different sub-periods. Netting out the World War One years in which productivity growth was low and supported by the traditional sectors, it is clear that the Fascist period is to be divided into two distinct phases. The “liberal age” coincided with a productivity boom propelled by the new sectors. The Great Depression did not spare either new and old sectors, yet the latter were hit more severely. However, the old industries recovered and even outperformed the new sectors across World War Two, stressing their vitality in a changing world. Finally, the shift of labour from the old to the new sectors was significant in explaining aggregate productivity growth only in the decade 1911–21; in the remaining 40 years, internal productivity growth was what counted most.

4.3.3 Accounting for changes in hours worked

Labour productivity computations based purely on the headcount of workers are known to be crude measures, which can lead to misleading conclusions. For example, in their study of the Anglo-American productivity gap in the interwar years, De Jong and Woltjer (2011) have shown how Broadberry’s (1997) finding that the productivity gap in manufacturing between the two countries was stable throughout

⁹⁶This result mirrors the one found by Broadberry and Crafts (1990a) for the United Kingdom in the same years.

the 1930s no longer holds when changes in the number of hours worked are correctly accounted for. As the average number of hours worked declined more rapidly in the United States than in Britain, relative output per hour worked rose faster in American than in British manufacturing.

Not accounting for changes in the number of hours worked can also be deceptive in the Italian case. As it is well documented in Toniolo and Piva (1988), the Italian official trade unions made work sharing one of the pillars of their action in the 1930s. As shown by Tattara and Toniolo (1976), the average working day in manufacturing fell from 7 hours and 17 minutes in 1929, to 6 hours and 43 minutes in 1932. The 11th October 1934 agreement signed by the trade union and Confindustria introduced the forty hours working week. It was then established by law on 26th October 1937⁹⁷. Changes in the number of hours worked did not however only affect the 1930s. Zamagni (1976) shows in fact how the average working day fell by as much as 20% between 1911 and 1919. Some important changes also occurred across World War Two. Federico (2003) argues that the average number of hours worked by factory workers rose by as much as 25% between 1937 and 1951, with light industries experiencing an increase in the region of 30%.

In order to account for these differences, we have put together a new dataset on the yearly number of hours worked in the four benchmark years of 1911, 1927, 1938 and 1951. In our attempt, we had to overcome significant problems of data

⁹⁷For an analysis of the effects of the 1934 agreement on unemployment, see Mattesini and Quintieri (2006).

	1911	1927	1938	1951
Mining	2,646	2,037	1,877	1,816
Food	2,360	1,817	1,458	2,143
Tobacco	2,995	2,306	2,042	2,193
Textiles	2,576	1,984	1,762	1,855
<i>Silk</i>	2,391	1,841	1,555	1,808
<i>Cotton</i>	2,723	2,097	1,903	1,886
<i>Wool</i>	2,902	2,235	1,867	1,930
<i>Other textiles</i>	2,289	1,762	1,723	1,797
Clothing and leather	2,182	1,877	1,652	2,088
Timber and furniture	2,478	1,908	1,757	1,818
Paper	2,931	2,256	1,956	2,236
Printing	2,899	2,232	1,935	2,310
Photography and cinema	3,704	2,852	2,473	1,887
Metalmaking	3,241	2,496	2,083	2,143
Engineering	2,798	2,180	1,819	2,099
Non metallic minerals	2,243	1,727	1,591	1,967
Chemicals	3,348	2,578	2,222	2,082
Rubber	2,671	2,057	1,773	2,036
Utilities	2,343	1,804	1,991	2,411
Old Industries	2,535	1,974	1,763	1,960
New Industries	2,925	2,255	1,979	2,112
Total	2,730	2,115	1,871	2,036

Table 4.3: Yearly hours worked by industrial workmen, 1911-1951

Sources: see text and Appendix 4.A

availability. Data on hours worked are in fact presented only in the 1937-9 and 1951 ICs and they refer exclusively to blue collar workers. For 1927 we use data from Assonime, a publication including data on the number of employees and hours worked for a sample of large firms. For 1911, no data are available, so we rely on the work by Zamagni (1976, p. 378), who has estimated that daily hours worked per worker

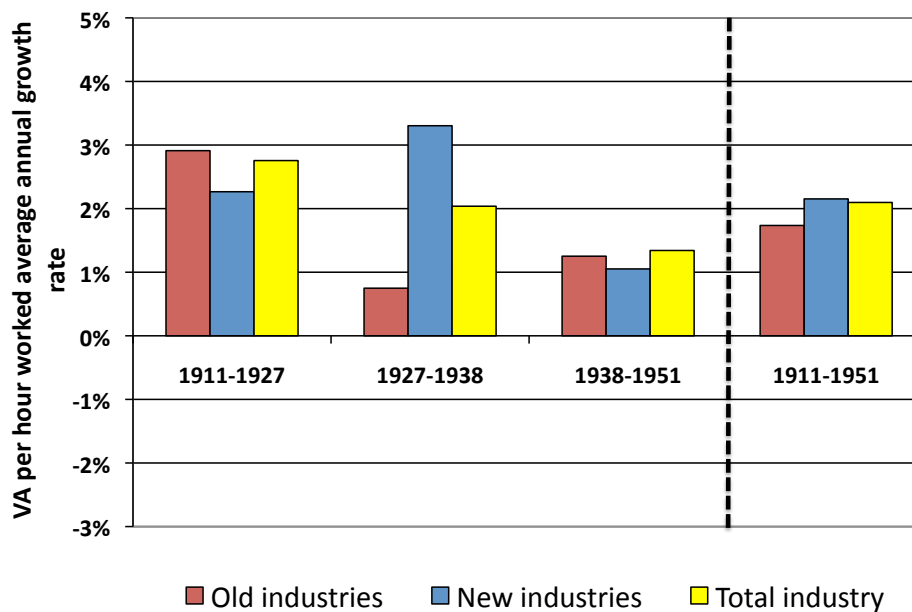


Figure 4.7: Hourly labour productivity growth in Italian industry, 1911-1951 (in %, per annum)

Sources: see text and Appendix 4.A

fell from 10 to 7.7 between 1911 and 1927⁹⁸. Table 4.3 shows changes in the hours worked per worker in the sectors considered in our work. We find a descending trend between 1911 and 1938, which is followed by an increase in the number of hours worked between 1938 and 1951⁹⁹.

⁹⁸We refer to Appendix 4.A for details.

⁹⁹This increase is less pronounced than what was found by Federico (2003), particularly for what concerns old industries. The difference has to do with a different handling of data from the 1937-9 IC. Federico seems to have divided the total number of hours worked, which only refers to industrial workshops, by the number of manual workers in both artisan and industrial workshops. This leads him to underestimate the number of hours worked by an amount which is particularly significant for those trades in which the number of craftsmen was large.

Figure 4.7 provides average annual sectoral VA per hour worked growth rates for the overall period and for three sub-periods. The average industry labour productivity measure from 1911 through to 1951 rises to 2.1% relative to 1.7% derived from the headcount measure. Unfortunately, due to data availability, it is not possible to separate the 1910s from the 1920s as we previously did, so we miss out completely on any 1920s productivity boom¹⁰⁰. However, the annual labour productivity growth rate between 1911 and 1927 in the overall industrial sector is 2.8%, and the highest measured in the forty years considered. Overall labour productivity growth rates reached nearly 2% in the 1927-1938 period, which means that industrial hourly labour productivity grew twice as fast as labour productivity per worker during the 1930s. The drop relative to the previous period is still, however, significant and even more so given that it is impossible to separate the fast-growing 1920s from the slow-growing 1911-1921 period. As for the 1940s, it is now clear that much of the positive result one could find when looking at output-per-worker figures was due to an increase in the number of hours worked. From 1938 to 1951, hourly labour productivity growth dropped to 1.3% in the overall industrial sector, which is half than the output-per-worker growth rate of 2.6%.

We again present figures on average annual labour productivity growth rates for

¹⁰⁰In order to calculate the total number of hours worked in a given year we need both an IC and a PC. In fact, we assume that only the workers counted in the IC worked “full time”; 50% of the ‘full-time’ number of hours worked is instead assigned to those workers, counted in the PC but not in the IC. This assumption is necessary due to the fact that, as discussed in Section 4.3.2, PCs include seasonal and part-time workers. For 1921 and for the nearby years we are lacking an IC. Hence we unfortunately cannot build a feasible estimate of total hours worked for this year. For more details, we refer to Appendix 4.A.



Figure 4.8: Structural components of Italy's industrial hourly labour productivity, 1911-1951

Sources: see text and Appendix 4.A

new and old industries respectively. When considering hourly labour productivity, differences between old and new industries increase somewhat: in the forty years considered, new industries annually grew 0.5% faster in productivity terms than old industries. Whereas new industries' growth increases during the Great Depression relative to the previous 1911-1927 period (reaching 3.3% per year), old industries' growth slows quite substantially (down to 0.5%). As for the case of output per worker, the period across World War Two saw the old industries doing better than the new ones, although less markedly.

Finally, we perform a shift-share exercise on hourly labour productivity data in the same manner as Section 4.3.2. Figure 4.8 confirms ever more strongly our previous claim that structural change was almost never significant in explaining industrial productivity growth. The biggest contribution was achieved in the 1940s, when it accounted for almost 15.4% of productivity growth, whereas on average in the former two sub-periods it only accounted for around 4.5%.

To conclude, does accounting for hours worked add to our knowledge of labour productivity growth under Fascism and during the two World Wars? Unfortunately data limitations are severe up to the point that output per worker remains our preferred labour productivity measure, used in the econometric analysis of our next Section. Yet, when comparing the two sets of estimates, a few remarks can be made. Although accounting for hours worked improves the overall performance of the 1930s, the fact that hourly productivity growth in the 1927-1938 period was roughly similar to the average 1911-1927 would in fact confirm the finding that there was a slowdown between the 1920s and the 1930s. Since the hourly productivity performance in Italian industry across the Great War is likely to have been worse than the one of the 1920s, the average over the 1911-1927 period is likely to hide productivity figures for the 1920s which were better than those registered for the 1930s. As for the different performance of the new and old industries, their labour productivity growth rates, however measured, were roughly similar in the period 1911-1951. Old industries dominated in productivity terms in the period 1911-1927 (but presumably only in the 1911-1921 period, as the output per worker data show) and during the

1940s. New industries ruled the roost in the 1930s, yet it is unclear the extent to which they deteriorated their hourly productivity performance relative to the 1920s. Finally, internal productivity growth is confirmed to be the main determinant of aggregate productivity growth. The general patterns outlined in Section 4.3.2 are thus confirmed even when taking into account the number of hours worked.

4.4 Labour productivity growth and competition policy

Section 4.2 has shown that industrial policy differed significantly between the two eras of Fascism, moving from a pro- to a significantly anti-competitive stance. Section 4.3 has put forward evidence that the era of liberal Fascism was characterised by faster rates of growth of labour productivity than the second period and that both new and old industries enjoyed slower rates of productivity growth following the regime shift. The current Section aims to explore whether changes in competition can explain changes in productivity growth, or whether the asymmetric performance of the different sectors of the Italian economy can be explained in terms of other factors.

In Section 4.4.1, we highlight the fact that there is no consensus over whether competition helped or hindered productivity growth in the Fascist era. As the theoretical literature on the matter is also inconclusive and since there is no existing econometric study on the period, economic historians of Italy who have tried to an-

swer this question largely had to compare a wide range of qualitative evidence, with results which are often contradictory. In Section 4.4.2, we perform the first empirical study on this matter, building an econometric model which is similar to the one presented in Broadberry and Crafts (1992). The main result is that, although the growth of capital intensity explains changes in productivity, there is a strong and significant negative relationship between our indicator of competition and productivity growth. This evidence confirms that the competition policy pursued circa 1926-7 was related to a poor performance of Italian industry.

4.4.1 The existing evidence

That economic historians of Fascist Italy disagree over whether the measures limiting competition had a positive or negative effect on productivity growth should not come as a surprise. In fact, the economic literature has identified at least three theoretical channels through which competition and productivity growth are related, yet has not been able to unambiguously predict the sign of this relationship.¹⁰¹ The first channel shows that competition has an effect on static efficiency: a change in competition could affect the level of effort put in by workers and managers to improve the performance of a given firm. A fall in competition can in fact lead to an increase in slack by both workers and managers, as it reduces the number of opportunities for comparing performance across firms¹⁰². Furthermore, Schmidt (1997), has argued that a reduction in competition reduces the threat of bankruptcy, lowering managers'

¹⁰¹This section only offers a brief summary of the links between market structure and productivity growth. Refer to Cohen (2010) for a comprehensive recap of the literature on the topic.

¹⁰²For the case of workers, see, in particular, Nickell, Vainiomaki and Wadhvani (1994). For the case of managers, see Hölmstrom (1982) and Hart (1983).

incentives to avoid this scenario. These two claims showing that more competition increases productivity growth are countered by a third one which shows that greater competition will actually lead to less effort. This is because an increase in the number of firms in the market may lead to a reduction in demand which may in turn reduce the level of effort by workers and managers required by the owner of a given firm (see Willig, 1987; Hermalin, 1992; Martin, 1993; Horn, Lang and Lungren, 1994).

Competition may also affect productivity growth through two other, dynamic, channels, which have to do, respectively, with R&D and with market entry. As for R&D, it has been argued that innovation may be reduced in the presence of lower product market competition as firms will benefit less from possible cost-reducing improvements and therefore will prefer enjoying a “quiet life”, in which incentives to innovate are low (Nickell, 1996, p.728). Seen from an opposite perspective, a firm’s gains from innovation at the margin are larger in a more competitive industry. As Arrow (1962) pointed out, assuming perfect appropriability of profits deriving from innovative activity (via the concession of patents, for instance), an incumbent monopolist’s returns to innovation are only the increment beyond the monopoly rents that it was earning beforehand (“replacement effect”). In contrast, a competitive firm would not be displacing any monopoly profit and would gain the full return from innovation: hence its greater incentive to invest in R&D. Yet, other studies lead to different conclusions. Schumpeter (1943) has claimed that an oligopolistic market structure makes rival behaviour more stable and predictable, thus increasing the incentive to invest. Also, the presence of *ex ante* market power may actually

induce firms to innovate to capture the *ex post* monopoly rents¹⁰³. Furthermore, a reduction in competition may lead to more innovation if credit constraints and other failures in financial markets make investments in R&D solely dependent on internal sources of funding (Blundell, Griffith and Van Renssen, 1999). The profits derived from the possession of market power ("deep pockets") would in fact provide firms with the cash flow necessary to invest in innovative activity.

As for the role of entrants, Jovanovic (1982) has argued that competition fosters efficiency by letting "many flowers bloom" and ensuring that only the best ones survive. Similarly, Hopenhayn (1992, p. 1142) points to higher costs of entry entailing less selection in an industry, lower average productivity and a higher expected lifetime of firms, including the less efficient ones. Conversely, Salop (1977) and Dixit and Stiglitz (1977) argue that more intense product market competition cuts post-entry rents, hence reducing the equilibrium number of entrants, in turn discouraging innovative activity. Similarly, Gilbert and Newbery (1982) claim that an incumbent monopolist has an incentive to pre-empt entry by investing more aggressively in innovation than an innovating entrant.

¹⁰³Aghion, Bloom, Blundell, Griffith and Howitt (2005) find evidence of an inverted-U relationship between industry-level market power, measured by an averaged Lerner index, and industry innovation, measured by the average number of citation-weighted patents. They argue that more competition fosters innovation and growth when an incumbent firm's pre-innovation rents are reduced by more than its post-innovation rents. Competition, hence, increases the incremental profits of innovating; R&D investments take place in order to 'escape competition'. This occurs in sectors in which all incumbent firms have similar technologies and are "neck-and-neck". Conversely, if there is a leader and a laggard, greater intensity of competition dampens a laggard's incentive to innovate, as it has little to gain from innovation, given that post-innovation rents remain low due to the competition with the leader. In this scenario, the Schumpeterian effect dominates the escape-competition effect.

These three channels have been widely referred to by those who have tried to gauge the impact of competition policy on industrial productivity growth in the Fascist era. In particular, the “optimist” field, which naturally included the regime and Confindustria, as well as a range of economic historians, underlined the role cartels had in promoting technical progress. An anonymous document found in the Confindustria archives and cited in Giordano, Piga and Trovato (2011, p. 13) lists among the advantages of introducing *consorzi* in the Italian economy the fact that the higher prices cartels guarantee to the producers allow firms to have greater revenues and to be able to invest in new technologies. This was also the opinion of Vito (1932, p. 173), who argued that cartels can favour productivity improvements, as they can promote new technical and scientific experiments and favour the diffusion of best practices¹⁰⁴.

A similar advantage was attributed to large groups by Petri (1997b; 2002), who has looked at the Schumpeterian process of innovation occurring, in particular, in the chemical and metal-making industries, and in the industries for the production of electricity and of oil and coal derivatives (Petri, 1997b, p. 245). To Petri, the innovative activity pursued by large Italian firms was essentially of two types. Firstly, there was some in-house R&D activity, whose results occasionally came with some delay. This was the case of the discovery of polypropylene by the future Nobel prize

¹⁰⁴Vito continues by listing a number of productivity improvements favoured by cartelisation in Germany. However, when he later describes the advantages brought to the Italian economy by the existence of cartels, interestingly his list does not include any specific technical advance. See Vito (1932, pp. 174-7).

winner, Giulio Natta. Although this discovery only occurred in 1954, Petri argues that Natta greatly benefitted from his work at the *Società anonima italiana gomma sintetica* (SAIGS), which had been created in 1939 by the rubber-making firm, Pirelli and then purchased by the chemical giant, Montecatini. Further to pursuing original innovative activity, large groups could facilitate the transfer of know-how from foreign firms into Italy¹⁰⁵. This was the case of the cooperation between Montecatini and the German cartel IG Farbenindustrie, facilitating the transfer of know-how for the production of a range of organic chemicals, or the agreements between the same IG and Pirelli over the production of synthetic rubber. Another example was the transfer into Italy of the hydrogenation and the catalytic refinement processes, invented by IG Farbenindustrie and Standard Oil. These were transferred to Italy in 1936 thanks to an agreement between these companies and ANIC, a joint venture involving Montecatini and the recently established oil firm, AGIP. The large sum paid by ANIC (US\$ 2.5 million, around 10% of its capital) for the licenses supports the argument that super-normal profits could be an important pre-condition for innovative activity.

While the “optimists” have mainly referred to R&D as the channel through which the reduction in competition occurring in Fascist Italy helped to increase productivity, evidence can be found to show that the anti-competitive measures taken by

¹⁰⁵For a peripheral, backward country, such as Italy was at the time, the process of knowledge transfer is undoubtedly an important path to productivity growth. Antonelli and Barbiellini Amidei (2007) dedicate many pages of their analysis of technological innovation in Italy in the period 1950s-1990s to the relevance of the process of “creative adoption” of foreign innovation which demands social capabilities and a certain degree of “technological congruence” between the follower and leader countries, in terms of market size, demand characteristics, factor endowments and availability of natural resources.

the regime hindered productivity growth through all three channels referred to in the theoretical literature. Firstly, there are signs that cartelisation limited the industrialists' incentives to increase efficiency. This was a problem which had been recognised by contemporaries. In January 1933, the *Rivista di Politica Economica* published an essay by the engineer Tullio Ortu Carboni. In a rare example of official dissent to the mainstream views, Ortu underlined how 'an excessively favourable sale price could induce firms to neglect industrial rationalisation, as the individual firm will not be worried about producing at low costs' (Ortu Carboni, 1933, p. 165). This also meant limiting the positive effect the Great Depression could have in pushing the least efficient producers out of the market. In Sarti's later opinion, 'voluntary cartels seldom led to significant improvements in the methods of production', as 'they usually took the form of price agreements whereby prices were pegged at a sufficiently high level to assure the survival of even the least efficient producers' (Sarti 1971, p. 100)¹⁰⁶.

Secondly, it can be argued that innovation was hindered by a limitation of competition. Contemporaries had worried about this particular aspect, too. In a speech given in Parliament during the vote on the law for the establishment of the *consorzi obbligatori*, the MP Francesco Paoloni warned against the risk that cartels may 'oblige those who have the best equipment not to use it and therefore hinder the improvement of the production process'. Such choices - Paoloni warned - 'may cause damages to the whole nation [...] as resting on a lazy and comfortable position which

¹⁰⁶Unfortunately, Sarti does not offer any evidence for this claim. It should also be noticed that this was also the reason why banks were generally in favour of the creation of cartels: by preventing firms from going bankrupt, they would also increase the probability of banks' credits being paid back (Cianci, 1977). Efficiency arguments simply did not have a place in this mindset.

is, however, technically backward, may one day lead Italy to a condition of suffocating inferiority vis-à-vis the technical development of foreign competitors' (Inf. Corp., April-May 1932, p. 680). His worries were, in fact, well founded¹⁰⁷. Despite what is claimed by Petri, in fact, several points can be raised to challenge the evidence he presents. Firstly, his examples refer to far too few branches that it is impossible to generalise from their experience¹⁰⁸. Furthermore, even in these branches, innovation was limited. Barbiellini Amidei, Cantwell and Spadavecchia (2011, pp.11-12), confirm that systematic research and the establishment of laboratories even in the "innovative" chemical industry was of a limited scale in Italy in the interwar years, the only exception being the short period between the introduction of autarky (1935) and the onset of the Second World War, which witnessed the establishment of laboratories and research offices, since 'developing new technologies was considered a matter of national interest'. However, even in this period, the scale of research activity was far less significant than in contemporary Germany, United States and Japan. Evidence from Giannetti (1998) shows that the national share of chemical patents deposited in Italy in the late 1930s increased 'only by a few dozen' in absolute terms,

¹⁰⁷As underlined by Caracciolo (1978a, p. 188), during the 1930s Italian industry became 'sclerotic' and, even when it expanded after the crisis, it did so 'strengthening acquired positions and with the minimum amount of risk or innovation'. This is also the view expressed by Cianci (1977, p. 210) who argues that increased concentration and cartelisation led to 'a drop in those creative incentives that are in every epoch crucial for industrial progress'. In this economic and political climate contacts and relations between firms 'did not end in higher productivity, technical progress, research of new raw materials and sales markets, but in the search for perks in confederations and ministries, in the Fascist party, in the government' (Cianci 1977, p. 210).

¹⁰⁸Petri's only examples in sectors which are not the four fore-mentioned ones, include some limited innovation in the wood industry and the introduction of an alternative way of producing cellulose (the *processo Pomilio*). This process, whose benefits were not visible until the post-war period, could diffuse thanks to the links between the large firm Burgo and a range of small-medium firms.

and hence ‘cannot be interpreted as a watershed towards a greater innovational potential’ (Giannetti, 1998, p. 109)¹⁰⁹. Furthermore, there is little evidence that the Italian breakthroughs happening in these industries were significant by international standards. With the exception of water electrolysis via the Fauser technique, the production of synthetic ammonia and of nitrogenous fertilizers (Giannetti 1998, p. 110), few Italian innovations were adopted outside the country. As for the process of knowledge transfer, this did not always lead to positive results. The different bargaining power between the Italian firms and the foreign conglomerates often meant that the processes introduced in Italy were not necessarily the best available ones. In 1939, IG Farbenindustrie and the Italian steel producing firm, Cogne, built a new plant for the extraction of magnesium in order to experiment a new, riskier, type of process at a lower cost than it would have been incurred in Germany. Its results were, unsurprisingly, meagre (Petri, 1997b, pp. 269-271).

As a last point, one can present evidence that the anti-competitive measures taken by the regime did, in fact, prevent “flowers from blooming”, that is impeded the entry of new competitors who could enhance sectoral productivity though their

¹⁰⁹More in general, Barbiellini Amidei, Cantwell and Spadavecchia (2011, p.12) concluded that ‘the Italian innovation activity measured in terms of Italian patenting abroad began a decreasing trend from the second half of the 1920s and remained at a relatively low level until the Second World War (...). A weak connection between science and industry was considered a major weakness of the Italian industrial system.’ Furthermore, in their empirical exercise, when regressing the share of industrial Italian patents abroad on a set of explanatory variables for the period 1920–1948, they found ‘positive and statistically significant coefficients [only] on the variables that depict the share of university students studying engineering, and the share of manufacturing industry in total Italian output. This was a phase of increasingly inward-looking development, in which the continued building of local technical skills and the commitment to industrialization were what mattered for innovation’ (Barbiellini Amidei, Cantwell and Spadavecchia (2011, p.35).

newly developed processes. As explained in Section 4.2, laws such as the one disciplining the construction or the enlargement were effective at keeping entrants out of the market and so was the decision by cartels to assign raw materials, production and market quotas on the basis of a firm's past share of the market¹¹⁰. An excellent example of the hostility faced by entrant is the case of Bombrini Parodi-Delfino (BPD), a chemical firm which tried to challenge the quasi-monopoly enjoyed by the chemical giant Montecatini. Having developed as a successful producer of explosives since the mid-1920s, BPD wanted to expand into other areas of the chemical industry. In particular, it was interested in entering the field of organic chemicals through the production of dying products, pharmaceuticals and plastic. As accounted by Petri (1997b, p. 282), this attempt was not blocked by the absence of a strong techno-scientific base at BPD, but because of the mutual exchange of favours going on between IG and Montecatini. Although BPD managed to obtain a limited number of patents from Germany, it was obliged to only use them to produce explosives, so as not to challenge Montecatini's dominance in the other markets. These difficulties and the breaking out of World War Two meant that its plans to expand into other areas of the chemical industry were effectively thwarted. As admitted by Petri himself, in this case 'the institutional rigidities of the interwar and war eras and the monopolistic positions enjoyed by its rivals' hindered the development of BPD, even though the firm 'had what it took to expand' (Petri, 1997b, pp. 282-3).

Overall, this Section has reviewed the evidence presented by the "optimist" and

¹¹⁰According to Sarti, these measures acted as 'a powerful brake on the economy' (Sarti, 1971, p. 102).

the “pessimist” field with regard to the impact of Fascist anti-competitive measures on industrial productivity growth. While the case of the “optimists” largely rests on the existence of a Schumpeterian process of innovation, that of the “pessimists” is based on three sets of arguments, namely that the lack of competition hindered innovation, that they reduced workers’ and managers’ effort and that they impeded the entry of more efficient producers. The next Section aims to adjudicate between these two views.

4.4.2 Econometric evidence for Italy

In this Section we apply panel data techniques to look for evidence of a link between the competition policy analysed in the previous Sections and labour productivity growth in Italy in the era of Fascism. In particular, we are interested in the role played by the decisions to support new industries and to restrict competition in the product market. This is the first study of this kind and, despite its methodological and data-related limitations, provides a useful framework to appraise the impact of these policies on the development of Italian industry.

In order to achieve this aim we employ a model which is a modified version of the one developed in Broadberry and Crafts (1992), concerning labour productivity growth in the UK in the 1930s. Relying on a cross-section of 79 industries, the two scholars regressed the average annual growth rate of labour productivity from 1924 to 1935 on an array of independent variables: the growth rate of the capital-to-labour ratio, as measured by the ratio of horsepower per worker; the decline in employment

from peak (1929) to trough (1932) during the Great Depression, which presumably reduced labour's bargaining power; a dummy variable taking value one for highly unionised industries; a second dummy variable taking value one for new industries; a third dummy variable taking value one for industries in which the price-cost margin fell by more than 25 per cent in the period under study.¹¹¹ Their results point to a positive correlation between labour productivity and capital intensity growth. Their new industry variable also presents a positive sign, yet it 'is by no means dominant' (Broadberry and Crafts, 1992, p. 537). High union density and an increase in competition both affected labour productivity growth significantly, the former negatively, the latter positively. Broadberry and Crafts conclude that 'the recessionary shock of the early 1930s improved labour productivity by weakening the resistance of organized labour, but the tendency for the market power of firms to increase had an offsetting effect' (Broadberry and Crafts, 1992, p. 538).

We build upon this study and apply a modified version of this model to our data on Italy. The first difference rests upon the nature of the datasets available: an 18 sector-level disaggregation of Italian industry, compared to Broadberry and Crafts' 79 sectors for the UK industry. We hence move from a cross-sectional dimension to a panel data setting, as we also have observations through time at our disposal. Wishing to focus solely on the Fascist period, we employ average annual labour productivity growth rates (LPRODGR) in three sub-periods 1921-1927; 1927-1938; 1938-1951 as our dependent variable. Our first independent variable is the growth in

¹¹¹As previously mentioned in Section 4.2.3, Broadberry and Crafts (1992) measured price-cost margins as in Cowling (1982).

capital intensity (HPWORKGR), measured as in Broadberry and Crafts (1992)¹¹². Our second regressor (NEW) is defined as in Broadberry and Crafts (1992): it is a dummy variable taking value one for new industries¹¹³. Next, we need a measure of competition. Differently to Broadberry and Crafts who use a dummy variable taking value one for industries in which the price-cost margin fell by more than a quarter, we prefer to use a continuous variable since it contains more accurate information and since we find the definition of their dummy variable somewhat arbitrary¹¹⁴. As seen in Section 4.2.3, we too have estimated industry-specific price-cost margins. Yet, as previously discussed, it is not possible to compute the Cowling index for the year 1921 due to lack of data. By using this competition measure, we would be therefore compelled to consider the overall period 1911-1927 in our empirical analysis, hence missing out on the precious possibility of isolating Italy's Fascist liberal period. We thus revert back to the industry-specific concentration indices, as published in Giannetti and Vasta (2006), which anyhow we have seen in Section 4.2.3 to have similar evolutions to our Cowling index in the period under study. C4GR is hence our third explanatory variable and it expresses the average annual rate of growth in C4¹¹⁵. Finally, conversely to Broadberry and Crafts' model, we do not include

¹¹²Recall our initial choice of comparing new vs. old industries rather than capital-intensive vs. labour-intensive industries as in Federico (2003), so as to be able to exploit this variable in our regression. Details on how these data are obtained are provided in Appendix 4.A.

¹¹³The list of new industries is the same as the one provided in Section 4.3.2.

¹¹⁴Note that when Broadberry and Crafts (1992) replace their price-cost margin dummy with a continuous variable, the latter loses in statistical significance.

¹¹⁵Another possible competition measure considered was the number of cartels in each industry. Yet two problems arise when handling this measure. First, it is not a truly reliable indicator of the degree of concentration of a certain industry. As discussed in Section 4.2.2, there may be few but dominant cartels in an industry, or many and ineffective cartels. Secondly, archival sources do not allow us to pinpoint a reasonably correct figure of the number of cartels in each industry for the four years considered.

the 1929-1932 drop in employment since our time-span covers a much longer period than that of the Great Depression years, nor do we include the unionized industries' dummy. As Mattesini and Quintieri (2006) and Giordano, Piga and Trovato (2011) point out, workers' conditions after the Palazzo Vidoni Agreement of 1926 were placed into the hands of a sole Fascist trade union, acquiescent towards the regime. Workers' bargaining power was hence small for most of the period and in all of the industries considered; thus this channel was here not investigated¹¹⁶. As a result, our baseline specification is the following:

$$LPRODGR_{i,t} = \alpha + \beta_1 HPWORKGR_{i,t} + \beta_2 C4GR_{i,t} + \beta_3 NEW_i + \epsilon_{i,t} \quad (4.2)$$

where i indicates each of the 18 industries, t each of the three sub-periods considered, α is a constant, and ϵ is a random error. We report our results in Table 4.4 after having run our regression with pooled OLS¹¹⁷.

Column (1) is our baseline specification. Growth in capital intensity (HPWORKGR)

¹¹⁶Another channel which we do not investigate is trade policy, which, as it has been explained in Section 4.2.2, was also employed by the regime. In particular, duties spiked in reaction to the Great Depression and were then accompanied by quotas and other restrictions to trade during Italy's autarkic period. As tariffs are levied on individual goods and not on entire sectors, a proper investigation of this channel would require the construction of a new dataset and this is beyond the scope of this paper. It is worth mentioning, however, that a detailed study by Federico and Tena concerning the period 1870-1930 has already concluded that 'there was no consistent strategy to favor any broad category industry over others - apart perhaps from a small preference for consumption goods over investment goods. So, as a first approximation, one would not expect big effects on the overall structure of the economy or on the growth rates of large sectors' (Federico and Tena, 1998a, p. 17).

¹¹⁷A Breusch and Pagan Lagrange multiplier test confirms the absence of random effects in our model. The presence of a time-invariant dummy variable (new) in our model prevented us from using a fixed effect model, which would anyway be too demanding for our data given the limited number of observations.

	(1) LPRODGR	(2) LPRODGR	(3) LPRODGR	(4) LPRODGR	(5) LPRODGR	(6) LPRODGR
HPWORKGR	0.626*** [0.0056]	0.637*** [0.0085]	0.616*** [0.0090]	0.622*** [0.0089]	0.625*** [0.0068]	0.655** [0.0157]
C4GR	-0.339** [0.0459]	-0.336* [0.0636]	-0.325* [0.0660]	-0.358* [0.0558]	-0.347** [0.0476]	-0.395* [0.0748]
NEW	0.009 [0.4067]	0.009 [0.4407]	0.01 [0.3868]	0.009 [0.4561]	0.011 [0.3525]	0.009 [0.4166]
HRSGR			0.2 [0.5928]			
L_C4GR				-0.044 [0.8860]		
IRI					-0.01 [0.3747]	
t1927						0.024 [0.2141]
t1938						0.008 [0.5243]
CONSTANT	-0.009 [0.4297]	-0.012 [0.3055]	-0.009 [0.4351]	-0.008 [0.5479]	-0.007 [0.5283]	-0.02 [0.2448]
Observations	54	48	54	54	54	54
R-squared	0.3429	0.3425	0.3445	0.3434	0.3491	0.3816
Robust p values in brackets *significant at 10%; **significant at 5%; ***significant at 1% Regressions are run with pooled OLS. Note that regressions (1) and (3)-(6) refer to overall industry; regression (2) is restricted to manufacturing.						

Table 4.4: Estimation results

is significant at a 1% level and presents its expected positive sign. The economic significance of this variable is considerable: the impact is more than three times larger than that found by Broadberry and Crafts (1992) for the British case¹¹⁸. C4GR is also significant at a 5% level and presents a negative sign. The magnitude of the coefficient tells us that an increase in the average annual rate of growth of the C4 index by 1 percentage point decreased labour productivity growth by approximately a third of a percentage point. The “new” dummy variable is not significant¹¹⁹. Notwithstanding the small number of explanatory variables introduced into our baseline model, the R^2 is satisfactory (0.34), especially when compared to the significantly lower one reported in Broadberry and Crafts’ (1992) model¹²⁰.

Different specifications of the model were also tested. Column 2 restricts our analysis solely to the manufacturing sector; hence the drop in the number of observations. The model does not lose power nor do LPRODGR and C4GROWTH lose much significance. The results of our baseline model are confirmed. We also try out

¹¹⁸We have considered the possibility of an endogeneity issue, in particular of a reverse causality between labour productivity growth and capital intensity growth. As well as capital accumulation affecting labour productivity, over long periods of time we may in fact also see increases in labour productivity, translated into a higher profitability, spurring on investments and thus contributing to a rise in capital stock. This potential problem, which is also present in the analysis by Broadberry and Crafts (1992), can be solved using instrumental variables. However, data availability severely limits our choice. We therefore ran a two-stage least-squares (2SLS) regression in which we instrumented the variable HPWORKGR with its lagged value. The latter is in fact presumed to be highly correlated with the instrumented variable, yet uncorrelated with the error term. However, a Sargan-Hansen test thereafter conducted rejected the null hypothesis of lagged HPWORKGR being a valid instrument (i.e. being uncorrelated with the error term). On the other hand, an endogeneity test did not allow us to reject the null hypothesis of exogeneity of HPWORKGR. This reassured us into treating HPWORKGR as an exogenous variable, hence validating the estimates of our pooled OLS regressions.

¹¹⁹We however retain the variable in our model, in accordance to Broadberry and Crafts.

¹²⁰The R^2 reported in Broadberry and Crafts (1992) is 0.24.

some augmented model specifications in order to reduce the omitted variables issue, if it exists. When adding the growth of hours worked (HRSGR) to our model (see column 3), justified by the possible effect of variations in working hours on output per worker growth, the new variable turns out to be not statistically significant. This may, however, be due to the construction of the hours worked variable in the period 1921-1927 for which no industry-specific data exist (see Section 4.3.3). We cannot therefore draw strong conclusions from this piece of evidence.

In column 4 we introduce into our model, alongside the growth rates of our concentration indices (C4GR), their lagged growth rates (L_C4GR). The latter in fact are inserted in order to test the assumption that an increase in concentration has positive effects on labour productivity not immediately, but with a time lag, a possibility which, as we have explained in the previous Section, can be derived from Petri (2006). Yet no significant correlation between labour productivity growth and the growth in concentration registered in the previous period emerges from the model. Interestingly, however, L_C4GR too presents a negative sign. This piece of evidence goes against the claim that, in the period under study, less competition was beneficial for productivity not immediately, but after a time lag. On the contrary, an increase in concentration is confirmed to have affected labour productivity growth, immediately and negatively. Column 5 includes a dummy variable which takes value one for industries controlled by IRI. State management and ownership of key industries could in fact have affected labour productivity growth¹²¹. Yet the IRI dummy

¹²¹On the one hand, studies such as Antonelli and Barbiellini Amidei (2007, p. 73) point to state ownership having encouraged R&D expenditure in firms and hence contributing to productivity

variable is also rejected as not statistically significant. Finally two time dummies (t1927 and t1938) also result not significant, separately but also jointly¹²². What emerges clearly from Table 4.4 is that the two variables, HPWORKGR and C4GR, always retain their statistical and economic significance in all alternative model specifications.

To conclude, our econometric evidence points to two main results for Italy's labour productivity performance in the three decades from 1921 to 1951: *a)* labour productivity growth and capital intensity growth were strongly and positively correlated. This could imply that capital accumulation was particularly important in Italy's growth process in those years, a finding which would confirm the hypothesis presented in Chapter 3. Capital accumulation might have mattered more than TFP growth which we know to have been slow, at least at the aggregate economy level (Broadberry, Giordano and Zollino, 2011); *b)* an increase in the C4 growth index, a measure for the level of concentration in each industry, was negatively correlated to labour productivity growth, nor did it contribute to the latter growth in later sub-periods. This finding confirms that, as in the contemporary British case, the competition-reducing industrial policy enacted during the 1930s had a negative effect on the growth of labour productivity in Italian industry.

growth (in the specific case of Italy in the 1960s and 1970s). On the other hand, mismanagement, corruption and rent-seeking in state-owned firms can also lead to a slowdown in productivity. Hence, the expected sign of this variable is ambiguous.

¹²²The latter result was obtained by performing a joint significance F-test on the two variables.

4.5 Conclusions

Between 1911 and 1951, Italian industry underwent a phase of significant modernisation, which the Fascist regime attempted to accelerate through active industrial policy. Using a newly compiled dataset, this paper analyses the evolution of labour productivity in the different branches of Italian industry, grouped into new and old industries, paying particular attention to the impact of the changes in competition policy occurring as of the late 1920s. The qualitative and quantitative evidence presented in this paper confirms the presence of a policy shift occurring around 1926-7. Following this shift, competition in the product market became more limited and the government began an active promotion mainly of the new industries. To assess the impact of these changes, we therefore construct a new benchmark for 1927 and analyse how labour productivity changed over four different benchmark periods between 1911 and 1951. We look at the evolution of industry as a whole, but also present disaggregated data for both ‘new’ and ‘old’ industries.

Three main results emerge. Firstly, in the sub-periods considered, there is a notable variance in the labour productivity growth patterns: in particular, very high productivity growth rates are experienced in the 1920s, while there is a slowdown in the performance of Italian industries in the 1930s. Secondly, new and old industries, on average and over the whole period, do not present significantly different labour productivity growth rates. Thirdly, when we perform a shift-share exercise, we find that industrial labour productivity growth was driven by growth *within* sectors rather than by the effect of reallocation of labour *between* industrial sectors. The condition

of structural change was minimal, especially in the 1930s, after the Fascist policy shift. Accounting for changes in the number of hours worked does not modify the general results, although the performance of the 1930s appears less severe than what is indicated by the output-per-head measure.

The paper also explores what were the main determinants of productivity and, in particular, whether product market competition played any role. In our econometric exercise, we find that capital accumulation was a significant driver of productivity, a finding which may explain the reduced contribution of TFP to Italian economic growth over the period which has been found in Chapter 3 of this thesis and in other studies (Broadberry, Giordano and Zollino, 2011). Changes in product-market competition were also negatively related with productivity growth, a finding which is robust to a set of different specifications and is confirmed by a range of qualitative evidence.

The current study could be expanded in a number of directions. Firstly, the newly constructed benchmarks could be used for an international comparison which would allow to trace the relative positioning and repositioning of the different branches of Italian industry more accurately. Secondly, our impression that capital accumulation may have overshadowed TFP growth as a driver of labour productivity needs to be confirmed by a more careful analysis. Research efforts should be pointed in the direction of estimating branch-specific estimates of the capital stock, which currently do not exist, in order to obtain branch-specific estimates of total factor productivity.

Thirdly, this study could be extended to later time periods, so as to better understand whether there was any impact of the industrial policy conducted in the 1930s on the post-World War Two boom. The preliminary evidence present in this paper would suggest that it did not, but more research is needed to confirm the plausibility of this statement.

4.A Data appendix

In this Appendix we describe the sources and methodology underlying the industrial data used throughout our paper, namely labour productivity and price-cost margins. In particular, we describe value added, employment, hours worked and wage data. In section 4.4.2 we also used horsepower data to build our capital intensity variable. The latter will also be discussed here.

I. Classification: The first issue to be tackled is the classification of industrial sectors. Not only do the classifications between different sources (PCs, ICs and the more recent works by scholars who have calculated industrial VA) differ, but the classification used by the same source (IC or PC) also changes over time. This second problem is solved using studies by Vitali (1970), furthered by Zamagni (1987), and Chiaventi (1987). These works have reclassified, respectively, the PCs and ICs in order to make them comparable diachronically. For this reason, they are largely employed in our work.

The first problem (standardisation between different sources) was harder to solve and severely limited the number of branches in which we could disaggregate industry. Our final classification is the one chosen by the Bank of Italy in the computation of the benchmarks of value added in Italian industry (Fenoaltea and Bardini, 2000a, p. 116), which we extend to include a disaggregation of the textile industry. The full list of sectors covered by our study has been presented in Table 4.2. As it is clear from the table, all industries except construction and “other industries” were

included. The former was dropped because of its extreme cyclicalities; the latter because its definition changed significantly over time. Thereby classified VA data were then matched with the corresponding data from Vitali (1970), whenever we intended to use the PC, and with the corresponding data from Chiaventi (1987), whenever we intended to use the IC.

II. Value Added at Constant Prices: In order to compute labour productivity estimates over time we were in need of industry-specific VA estimates at constant (1938) prices. These are conveniently provided by Carreras and Felice (2010), who estimate yearly industry-specific VA from 1911 through to 1938. For 1951, we use unpublished data which were kindly provided to us by Emanuele Felice (2011). These estimates are fully consistent with Carreras and Felice (2010).

III. Value Added at Current Prices: In order to estimate price-cost margins, value added at current prices is also needed. We here use different sources for different years.

1951. See Fenoaltea and Bardini (2000b).

1938. See Fenoaltea and Bardini (2000a).

1927. See Carreras and Felice (2010).

1921. See Carreras and Felice (2010).

1911. Data for industrial value added at current prices for this year are mostly taken from Fenoaltea (1992). A special effort was made to update these figures in light of the scholar's more recent work. The estimate for tobacco, as well as those for the paper and printing industries therefore come from Fenoaltea (2000b). The data for the non-manufacturing industries, namely mining and utilities come from Ciccarelli and Fenoaltea's (2009) new regional estimates, which were aggregated by us. The data for the chemical and rubber industries come from Fenoaltea (2007). Data for metalmaking come from the new national estimates by Ciccarelli and Fenoaltea (2010). Data for the textile industry come from the new regional estimates by Fenoaltea (2004), which were by us aggregated. Data for mechanical engineering and the production of non-metallic minerals come from new unpublished figures which were kindly provided to the authors by Carlo Ciccarelli and Stefano Fenoaltea¹²³.

IV. Employment: The headcount number of workers in the different branches of the industrial sector is calculated on the basis of the PC figures. As explained in Section 4.3.2 this decision is based on the fact that the VA estimates at constant prices used to compute the labour productivity estimates assume that the working population was the one included in the PC rather than that of the IC. In order to compute our employment figures, we have made extensive use of the estimates by Vitali (1970). These estimates have the precious advantage of being reclassified ho-

¹²³The new estimates for mechanical engineering include the new data for the shipbuilding industry contained in Ciccarelli and Fenoaltea (2008).

mogenously, and hence of being comparable over time. Yet they also present some problems, which led us to adjust Vitali's estimates in a number of cases. These adjustments are listed below:

a) Vitali provides estimates for 1911, 1921, 1931, 1936 and 1951. Since we were interested in having figures for 1911, 1921, 1927, 1938 and 1951, we had to extrapolate the figures relative to 1931 and 1936 to 1927 and 1938 respectively. This procedure has been previously by Fenoaltea and Bardini (2000a) as one of their steps in the calculation of VA at current prices for 1938. Therefore, to compute the extrapolation relative to 1938, we follow the exact procedure by Fenoaltea and Bardini (2000a). The two scholars employed branch-specific "employment" indices, which are, in fact indices of production largely taken from Carreras (1982). We replicate this exercise, extrapolating the figures relative to 1936 present in Vitali via the same indices. To be consistent with this procedure, a similar exercise is followed for 1927: here we employ the branch-specific estimates by Carreras and Felice (2011) to retropolate the 1931 data to 1927. Since the work of Carreras and Felice (2011) is largely based on Carreras (1982), this makes the two procedures consistent.

b) Vitali's estimates are at constant 1951 boundaries, while the VA estimates we use to compute productivity are at the boundaries of the time. This is a problem, as Italy gained territory after World War One, to then lose part of it after World War Two. We therefore needed to adjust Vitali's figures to compute employment at the boundaries of the time. To do so, we used the coefficients published in Zamagni

(1987, p. 43). In particular, we subtracted 2.1% employment from the 1911 figure and added on 1.7% in 1921, 1931 and 1936. One problem with this procedure is that these coefficients was applied to the aggregate industry figure and to all the sectoral data. This would mean assuming that the territories which were gained and lost following the conflicts had the same sectoral distribution of labour as the Italian economy as a whole, which is clearly not necessarily true. However, given the small size of the adjustment, we do not expect this to significantly bias our estimates.

c) A range of other, smaller adjustments is also made. Firstly, Vitali's estimates do not disaggregate the textile industry, while we found it helpful to do so. In order to make this adjustment, we had to revert back to original PC figures. For 1911, 1936 and 1951, the PCs offered sufficient disaggregation so that we could combine the different categories present in the censuses into the four sectors we have divided the textile industry into. In this case, therefore, we simply re-proportioned these four figures, so that their sum would match the total from Vitali. As for the 1921 and 1931 PCs, they provide a lower level of disaggregation for textiles, which did not allow us to combine existing categories into the four branches we had identified. Hence, to break these more aggregate figures down to a lower disaggregation, we used the average of the relevant proportions from the 1911 and 1936 censues. Secondly, for the case of 1911, the more accurate employment data for the chemical and rubber industry comes from Fenoaltea (2007). Thirdly, for all years, the relevant IC figure is taken instead of the actual/extrapolated PC figure, when the former is found to be higher. This adjustment is rarely made, since, as we have discussed, the IC figure

is almost always lower than the corresponding PC figure.

V. Hours worked: Our main sources were the ICs, since PCs contain no information on hours worked. However, even the ICs report hours data only in 1937-39 and 1951, hence the use of different sources and methodologies, which we describe in detail in this paragraph. In general, in order to calculate the total number of hours worked in a given branch, we first calculate a branch-specific coefficient of number of hours worked per year by an individual worker. These figures correspond to those we have presented in Table 4.3. Because of the nature of the sources used, this figure normally assumes that the worker is fully employed. However, since our employment figure is largely based on PCs, we expect some of the workers counted to be under-employed or seasonal. Since we do not have an accurate measure of how many were exactly this kind of workers, we follow Felice's (2005) methodology. We exploit the difference between the PC and the IC figures and assume that the workers who were counted in the PC but not in the IC were under-employed or seasonal workers. We therefore attribute to the latter a number of hours worked per person which is only half of that we have estimated on the basis of our sources. Conversely, we attribute to the workers who were counted in the IC the full number of hours worked per person. Since no IC was held in 1921, it was impossible to compute a comparable figure for this year. This explains why we could not construct an estimate for 1921. We now provide a description of the sources used to calculate the number of yearly hours worked per person relative to each individual benchmark year.

1951. We took the branch-specific total number of hours worked by manual workers from the IC and divided it by the total number of manual workers present in the same census. However, since the number of hours worked refers to 1950, whilst the number of workers refers to 1951, and since the total number of hours worked is likely to have increased between 1950 and 1951, the resulting effect is probably an underestimation of the number of hours worked by each workman. Unfortunately, there were no available employment indices for 1950-1951, which is why the data have been left uncorrected.

1938. We took the number of hours worked by manual workers in industrial plants taken from the IC and divided it by the total number of workers in industrial plants. In this case, too, the data on the number of hours worked usually referred to the year preceding the one in which the headcount was made. Differently from 1951, however, in this case we could employ a range of branch-specific indices on the number of hours worked, which are largely taken from Assonime. When such an index was not available, we used branch-specific indices of employment taken from Fenoaltea and Bardini (2000a).

1927 . The procedure used to obtain the number of average number of hours worked per year in 1911 and 1927 is more complicated, as the relative ICs did not collect data relative to the number of hours worked. To calculate these estimates, we have to rely on other sources. For 1927, we largely employ data on the total number of hours worked and the total number of employees as taken from Assonime. This source does

not allow us to cover all sectors, which is why we have to do a rough matching. In order to minimise the inconsistencies between this source and the IC, we rescale the thereby obtained figure by using the ratio of the figure from this source relative to 1938 and the figure coming from the IC.

1911. The 1911 data are calculated using the branch-specific estimates for 1927, corrected by the average reduction of daily hours in industry, which is taken from Zamagni (1984, p. 75). This corresponds to a fall from 10 hours a day to 7.7 hours.

VI. Wage bill: Data on the wage bill are needed to calculate the price-cost margins. Our main sources were the ICs, since PCs contain no information on wages. However, even the ICs report wage data only in 1937-9 and 1951, hence the use of different sources and methodologies, which we describe in detail in this paragraph. In general, in order to calculate the total wage bill in a given branch, we first calculate a branch-specific coefficient of the total amount earned in a year by an individual worker. Because of the nature of the sources used, this figure normally assumes that the worker is fully employed. However, since our employment figure is largely based on the PCs, we expect many of those who are counted to be under-employed or seasonal workers. This problem is analogous to the one encountered in building the estimates for the number of hours worked. Hence, we adopt the same methodology, comparing the IC and the PC figures. In particular, we attribute a wage which is only two-thirds of that we have estimated on the basis of our sources to the workers included in the PCs but not in the ICs. Conversely, we attribute to the workers who

were counted in the IC the full wage. Since no IC was held in 1921, it was impossible to compute a comparable figure for this year. We now provide a description of the sources used to calculate the amount earned per person relative to each individual benchmark year.

1951. We took the branch-specific total wage bill for workers from the IC and divided it by the total number of workers present in the same census. Since the first figure excluded craftsmen, we had to exclude craftsmen from the headcount data and we did so on the basis of information provided in Chiaventi (1987). As in the case of the number of hours worked, the wage bill calculated in the IC refers to 1950, while the number of heads is counted in 1951. Unfortunately, as there is no index of industrial employment relative to the years 1950-1, we do not correct the wage bill figure for the change in the number of employees which occurred between the two years. Since we expect this number to have risen between 1950 and 1951, this is likely to underestimate the yearly wage each worker received. However, we do correct for the growth in wages which occurred between the two years. This is done using data on the aggregate wage which is taken from Rossi, Sorgato and Toniolo (1993).

1938. We took the branch-specific total wage bill for manual workers in industrial plants from the 1937-9 IC and divided it by the total number of workers in industrial plants. In this case, too, the data on the figure for the wage bill usually referred to the year preceding the one in which the headcount was made. Differently from

1951, however, in this case we could employ a range of branch-specific indices on the number of employees, which are largely taken from Assonime, in order to correct the wage bill figure for changes in employment occurring between 1937 and 1938. Furthermore, we used branch-specific data on hourly wages taken from Zamagni (1976, p. 374) to correct for wage inflation between the two years.

1927. The procedure used for 1911 and 1927 is more complicated, as the relative ICs did not collect data relative to the wage bill. To calculate these estimates, we have to rely on other sources. For 1927, we rely on data on hourly wages. Most of these data come from Zamagni (1976, p. 374) and actually refer to April and July 1928. We take the average of the two months and extrapolate it to 1927 using an index of industrial wages also from Zamagni (1976, p. 378). For the textile industry, a slightly different procedure is followed: rather than relying on the data relative to 1928 which refer to all textiles, we prefer to use data relative to 1925, also taken from Zamagni (1976), which refer to individual textile industries. We then extrapolate these data to 1927 using the fore-mentioned index. On the basis of these sources, we now have a dataset of branch-specific hourly wages relative to 1927. In order to transform it into the total wage bill, we use two different procedures for those workers who appear in the IC and for those workers appearing in the PC and not in the IC and which we assume are seasonal or underemployed workers. For the workers present in the IC, we multiply the hourly wage times the yearly number of hours worked by an individual worker in 1927 (as calculated in "V. Hours Worked"), and then multiply this number times the number of workers present in the IC. For the workers present

in the PC but not in the IC, we first multiply the hourly wage times two-thirds and then multiply it times half the yearly number of hours worked by an individual worker in 1927. Finally, we multiply it times the number of workers present in the PC but not in the IC. The sum of these two figures constitutes the total wage bill.

1911. The 1911 data are calculated using branch-specific data on the daily wages of industrial workers from Zamagni (1984, pp. 68-69 and 87), which we divide by the typical number of hours worked per day taken from Zamagni (1976). On the basis of these sources, we now have a dataset of branch-specific hourly wages relative to 1911. In order to transform it into the total wage bill, we use two different procedures for those workers who appear in the IC and for those workers appearing in the PC and not in the IC and which we assume are seasonal or underemployed workers. For the workers present in the IC, we multiply the hourly wage times the yearly number of hours worked by an individual worker in 1911 (as calculated in "V. Hours Worked") and then multiply this number times the number of workers present in the IC. For the workers present in the PC but not in the IC, we first multiply the hourly wage times two-thirds and then multiply it times half the yearly number of hours worked by an individual worker in 1911. Finally, we multiply it times the number of workers present in the PC but not in the IC. The sum of these two figures constitutes the total wage bill.

VII. Horsepower: The data for on horsepower come from the various ICs, as standardised in Chiaventi (1987). This source has the advantage of dealing with the

inconsistencies in the calculation of the number of horsepowers which characterised the ICs. In particular, Chiaventi (1987) eliminates the duplications relative to the 1927 IC, when ISTAT incorrectly summed primary and secondary engines, largely overestimating the total number of horsepower in the Italian economy of the time¹²⁴. As no IC was held in 1921, the figure for the number of horsepower relative to this year is interpolated using the 1911 and 1927 data.

¹²⁴For more details, see Chiaventi (1987, pp. 126-131 and 148-9.).

4.B Robustness check: labour productivity growth based on industrial census data

As a robustness check, in this Appendix we present the results obtained by calculating our labour productivity estimates using employment data from the ICs rather than from the PCs. Differently from the PCs which included information on the labour force, the ICs provide information on the number of workers present in industrial plants on the day of the census. Therefore, in theory, the IC is a more accurate source from which to measure employment than the PC. However, its imperfect coverage has made scholars skeptical of the information therein contained. This is particularly true for the first IC, held in 1911, which, as Fenoaltea has remarked in his many contributions to the literature, failed to pick up “domestic” activity as well as all production carried out at the same address as the mater’s residence (this included the large rubber-making firm, Pirelli)¹²⁵. The 1911 IC also formally excluded any plant with less than two employees, which were around 241,000 in 1927. This, and the other reasons which led to our choosing the PC figures as our preferred estimate, are described in detail in Section 4.3. We here however feel the need to implement a robustness check.

4.B.1 Data

As the numerator of our labour productivity estimates, we use VA at constant prices described in Appendix 4.A. What changes is the denominator which we here de-

¹²⁵For a more detailed explanation on the problems associated with the 1911 IC, see Fenoaltea, 2003b, pp. 1095-1100.

scribe. The headcount of workers is taken from the following sources.

1911. We employ the figures published in Chiaventi's (1987) work, which standardised the data relative to the 1911-1951 ICs. In particular in 1911, to tackle the formal exclusion of one-employee firms from the underlying IC, Chiaventi calculated the number of employees working in plants with one employee as a share of the total number of employees for 1927 and applied this coefficient to 1911. We apply the same methodology in order to add on the excluded workers, yet do so branch by branch (conversely to Chiaventi who does it for industry as a whole). Our corrections range from zero (for branches such as chemicals, metalmaking or tobacco), to almost 30% (for branches such as the leather industry).

1927. We use the figures present in Chiaventi (1987) with no further adjustments.

1938. We employ the figures relative to the IC taken from Fenoaltea and Bardini (2000a), which are more precise than Chiaventi's in that they are corrected for seasonality. The 1937-9 census was, in fact, conducted over several months of different years, in order to measure each sector at the peak of its productive capacity. We however include in Fenoaltea and Bardini's numbers the workers in *servizi generali di stabilimento*, which were by them excluded, but included by Chiaventi (1987).

1951. Again, we use Fenoaltea and Bardini(2000b)'s figures, which are very similar to Chiaventi's. The only major departure concerns the data for the the oil industry:

Fenoaltea and Bardini (2000b) in fact substantially reduce the number of employees working in the branch so as to exclude those involved in agricultural activities. We accept their revision.

In our VA-per-hour-worked measures, which we also compute in this section, we multiply our IC-based employee figure and multiply it by the same branch-specific coefficient of hours worked used for our benchmark estimates and described in Appendix 4.A.

4.B.2 Results.

Given the IC data constraints, we could only measure productivity over three benchmark years, thus failing to separate the World War One period from the era of liberal Fascism. The results are presented in Figure 4.9 and confirm that the 1927-1938 period is the one of slowest productivity growth, even though the difference with the earlier period is much less marked than in the case of our preferred estimates. Once again, the 1938-1951 period is characterised by the fastest productivity growth, although this robustness check suggests that our preferred measure may have exaggerated the speed of the process.

When one differentiates between new and old industries, the finding that the new industries did much better than the old industries in the 1930s is confirmed. Some important differences with our preferred measure emerge as far as the first period is concerned: using the IC data the performance of the new industries over the 1911-

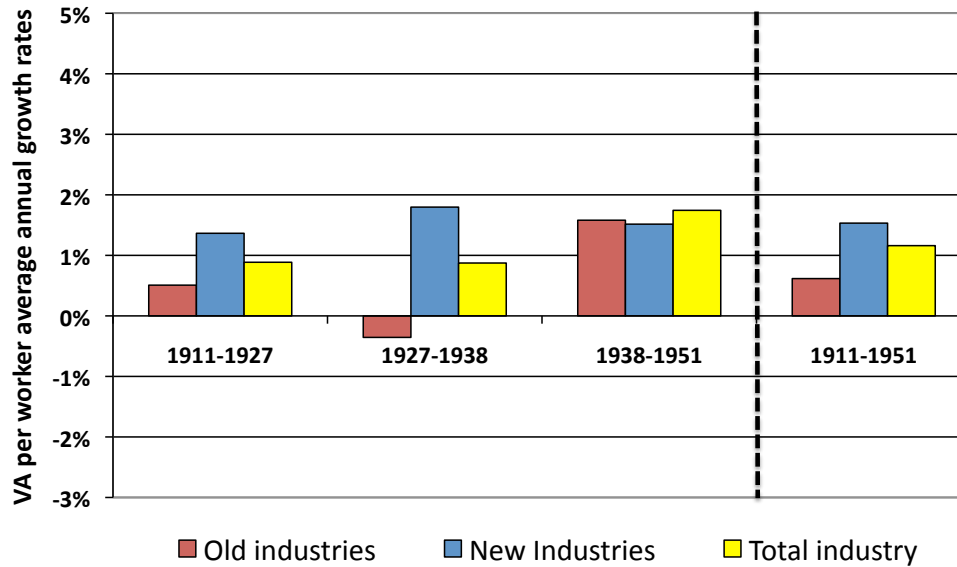


Figure 4.9: Labour productivity growth in Italian industry, 1911-1951, industrial census (in %, per annum)
Sources: see Appendix 4.B.1

1927 era appears much better than the one provided by the PC figures. This finding also has an impact on the overall rate of growth for the whole 1911-1951 period, which is now fairly different between new and old industries. Unfortunately, because of the nature of this dataset, it is impossible to say whether the fast productivity of the new industries over the 1911-1927 period is due to changes in the World War One or in the liberal Fascist era.

Figure 4.10 aims to understand whether productivity growth in Italian industry was due to internal productivity growth or to the shift of resources from low-level

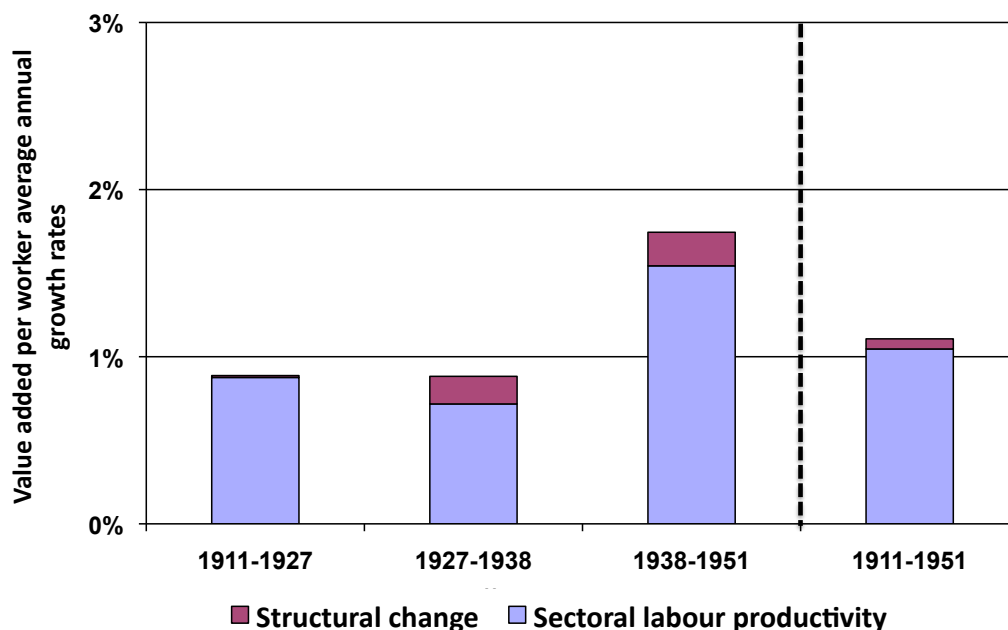


Figure 4.10: Structural components of Italy's industrial labour productivity, 1911-1951, industrial census

Sources: see Appendix 4.B.1

productivity sectors to high-level productivity sectors. As in the case of our preferred estimates, a large part of labour productivity growth appears to be due to internal productivity growth. Differently from them, however, this robustness check would imply that structural change was proportionally more important in the 1930s than in any other period.

The same exercise is repeated by using the data on hours worked. Figure 4.11 plots annual average output per hour worked growth rates. Figure 4.12 highlights the contribution of structural change to labour productivity growth. In general, also

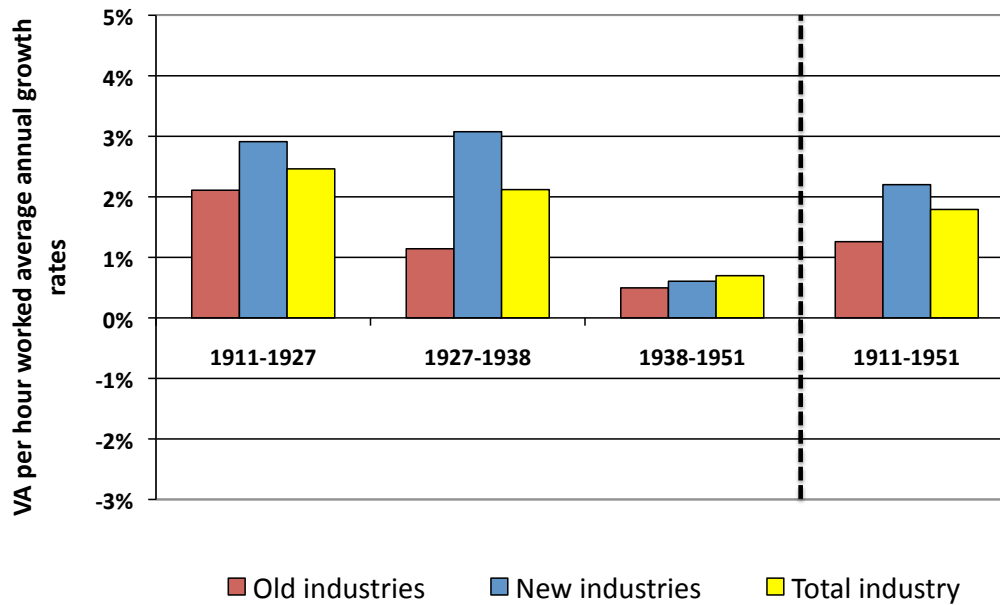


Figure 4.11: Hourly labour productivity growth in Italian industry, 1911-1951, industrial census (in %, per annum)

Sources: see text

for construction reasons, the results concerning output per hour worked growth rates based on IC figures are similar to those based on PC figures. Labour productivity growth rates in the new industries do not seem to vary between 1911-1927 and 1927-1938, whereas old industries still see a fall, hence contributing the the slower growth in the 1930s relative to the previous period. No other significant difference appears relative to Figure 4.7. Structural change again played a marginal role in contributing to labour productivity growth. World War Two and the reconstruction years show up again those in which a shift of hours worked from old to new industries had a minimal impact.

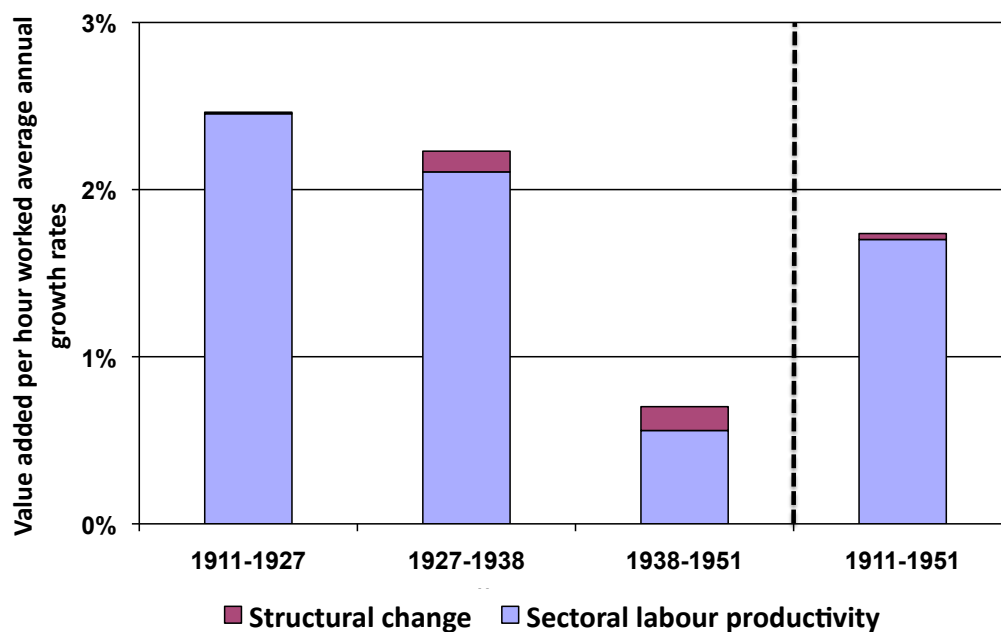


Figure 4.12: Structural components of Italy's industrial hourly labour productivity, 1911-1951, industrial census

Sources: see Appendix 4.B.1

To conclude, the robustness check conducted in this section reassuringly does not contradict our main results obtained via PC estimates of employment, which for both theoretical and empirical reasons are anyhow the data to be used in the context of this paper.

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