

# Selective credit policies and economic development in post-WWII Italy

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## Abstract

The aim of the paper is to gauge the rationale of the selective credit policies implemented in Italy under the 1936 Banking Act in the four decades following World War II, via a better understanding of their links with sectoral and regional economic performance indicators, based on both archival research and empirical analysis. In particular, we have constructed two novel credit datasets, which explore the sectoral and regional dimensions of bank loans, respectively, to Italy's industry. Panel cointegration techniques allow us to exclude a sectoral rationale of the policies implemented, thereby contradicting coeval official declarations which pointed to a sectoral purpose of the measures introduced: whereas ordinary long-term credit reacted positively to economic performance, its subsidised counterpart did not present any long-run relation with either sectoral value added or productivity. Conversely, the achievement of regional convergence was a more evident aim of Italy's postwar credit policies: long-term credit in both its components responded negatively to regional activity rates and positively to industrial labour shares and GDP per capita, suggesting that bank loans were directed to those areas with lower employment and to those which presented higher growth potential via industrialization or larger feedback effects of bank credit on economic growth. Finally, there is evidence of a substitution effect between ordinary and subsidised loans in the central and southern regions of Italy (i.e. subsidised funds were funnelled when and where ordinary bank loans were scarce and/or they crowded out the latter), whereas in the North the behaviour of the two categories appears to be unrelated.

**Keywords:** credit policy, sectoral economic growth, regional development, panel cointegration

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## 1. Introduction

The view that credit may represent a crucial factor in the performance of an economy is old, and has been heatedly debated ever since. Mainstream economists, after having shunned it for a long time, contending that finance simply adapts to growth, in the past two decades have accepted the idea that, to some extent, an efficient financial system gives a contribution of its own to economic development. This realization does not imply, though, that the public authorities should enact intrusive credit policies aimed at credit allocation. On the contrary: the idea that finance is an engine of growth was one of the key elements supporting arguments for financial deregulation. Many believe that finance is an industry no different from any other, and that it should be left to the care of the market (if one excludes the standard antitrust policies). Others, less fervent believers in the virtues of the market, contend that rules are warranted, but only if aimed exclusively at guaranteeing some measure of stability to single financial firms and to the system as a whole. Yet in the decades following World War II in many Western countries credit instruments were actively used by governments in order to achieve a broad array of aims, amongst which long-term growth; in less developed countries today similar policies are still advocated.

We define credit policies as the variety of measures adopted to encourage or direct the flow of funds to priority classes of borrowers, sectors, geographic areas, where the priority is determined within a broad spectrum of economic, social and political goals (for example, increase productivity and growth, favour innovation, avoid overproduction, boost employment, etc). They are direct instruments of credit control, as opposed to general and non-discriminatory credit instruments used by monetary authorities, which are employed for their allocative and (re)distributive aims rather than for their general impact on the volume of loans; the composition of bank credit thus becomes more relevant than its total supply (although the volume of loans can also affect their composition, as a later example will prove). Credit policies therefore modify the cost and the availability of loans compared with those that credit markets would determine in their absence; they influence credit allocation and interest-rate structure relative to a free-market benchmark. These measures are based on the assumption that differentiating cost and availability of funding across sectors, for example, actually affects economic activity within each sector.

Why should credit policies be effective according to economic theory? Government agencies may have superior information on sectoral/regional prospects than individual private firms and may therefore have an advantage in screening investment projects, hence reducing adverse selection risks. Governments may also have advantages in monitoring firms' behavior and in verifying outcomes, thereby reducing moral hazard issues. Furthermore, governments are likely to

have lower costs of enforcing contracts (for example via police powers). The flip side of the story is that government involvement in credit allocation may result in rent-seeking and corruption, thereby undermining credit policies' objectives.

Postwar credit controls in Western Europe have been studied by various scholars and international institutions. Amongst others, Hodgman (1973) provides a thorough review of credit policies in a number of countries (Italy, France, Belgium, Germany, the Netherlands, U.K.), which may be supplemented by the yearly descriptions of domestic bank lending in the Bank for International Settlements' *Annual Reports* (Bank for International Settlements, various years). Monnet (2012) conducts an excellent analysis of France's credit allocation and economic planning systems during the Golden Age. Ross (1992) and Forsyth (1997) expand their viewpoint by also considering the related macroeconomic policymaking undertaken in the same years respectively in Great Britain and in four Western countries including Italy.

This paper is a case-study of Italy's credit policies (mainly under the form of subsidised credit) and their link to growth in the four decades following WWII. With the exception of Monnet, the mentioned studies do not provide any quantitative assessment of the postwar credit policies analysed; conversely, in our paper we attempt to empirically assess the rationale underlying credit allocation in Italy. Owing to the nature of our datasets, we focus solely on Italy's microeconomic credit policies and banking regulation, thereby necessarily disregarding the concurrent monetary policies which also affected bank lending.<sup>1</sup> Yet on the latter topic the literature is more abundant (see for example Baffi 1973, Padoa Schioppa 1974, Cotula and De Stefani 1979, Gelsomino 1998). Furthermore, whereas in some countries such as Great Britain, the increasing disintermediation of the banking system may have had an impact on the effectiveness of credit controls in the 1950s for instance and thereby may have diluted the interest for the subject, in Italy the financial system was highly bank-oriented until very recent years; hence tinkering with the mechanisms ruling in the bank credit market was bound to have some effect on the overall economy.

The first part of the paper, which spells out banking legislation, selective credit policies, institution and allocative tools, benefits from research conducted in Banca d'Italia's historical archives. Introduced under Fascism, but designed by the *Istituto per la Ricostruzione Industriale* (Industrial Reconstruction Institute) think-tank, the 1936 Italian Banking Act had the double aim of

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<sup>1</sup> As the economist and central banker Tommaso Padoa Schioppa pointed out in an article published in 1974, the allocation of bank loans is not entirely independent from the availability of funds and therefore from the general stance of monetary policy. A poignant example is the impact on credit allocation of Italy's restrictive monetary policy of 1969-1970 (Padoa Schioppa 1974, p. 349): data from the Central Credit Register indicated that the share of funds to smaller clients significantly declined in that occasion, as noted also in the Bank of Italy's *Annual Reports* of 1970 (pp. 236-40) and 1971 (pp. 246-250). The larger concentration of loans to bigger borrowers, following the restrictive monetary stance, was a result of lenders shying away from clients with greater risks attached or simply with less bargaining power.

preventing banking instability and crises, also via a distinct separation between long-term and short-term credit institutions, as well as of allocating credit in the economic system. Initially intended to promote those sectors most relevant in an autarkic context, after WWII and the demise of Fascism, the Act was preserved. Credit flows were then, at least in part, directed strategically by governmental bodies in order to achieve reconstruction, economic development and industrialization aims, as well as reduce regional disparities. The Banking Act was accompanied by fast-growing secondary legislation, mainly rules set by the Bank of Italy. The vast panoply of instruments at the Bank of Italy's disposal included: authorization of loans; authorization to issue bonds; caps on interest rates; reserve requirements; rules on the composition of the banks' bond portfolios. Moral suasion was also largely used. Furthermore, direct State ownership and management of banks was widespread, thus facilitating credit direction significantly. Finally, subsidized credit (*credito agevolato*) was increasingly supplied, mainly through the lending activity of the long-term credit banks.

In its second part, the paper relies on our newly constructed datasets in order to assess the rationale of Italy's selective credit policies. We intend to go beyond the official declarations and single out, if possible, the actual driver in the selection of borrower firms. In order to achieve this aim, our new sectoral and regional credit data are carefully matched with national accounts' figures. The former, in particular, are available thanks to more precise and disaggregated credit statistics which were collected by the Bank of Italy after the enactment of the 1936 Banking Act. Our analysis ends in the 1980s when the regulation was loosened and finally replaced by new legislation in 1993.

The paper is thus organized as follows. Section 2 describes Italy's institutional setting and the credit policies introduced and enforced in the period 1936-1980s. Section 3 surveys the existing theoretical and empirical literature on the links between credit, including credit policies, and productivity. Section 4 presents descriptive data on both sectoral short-term and long-term credit and on performance indicators in Italy in the period 1951-1988. Section 5 instead presents our regional (long-term ordinary and subsidised) credit dataset, together with figures on regional structural indicators. In Section 6 we adopt standard panel cointegration techniques to explore the relationships firstly between sectoral credit and output data and secondly between regional long-term loans and structural factors. In Section 7 conclusions are drawn.

## **2. Italy's credit policies under the 1936 Banking Act framework**

The roots of what is commonly defined as the 1936 Banking Act can be traced back to the 1934 *Convenzioni*, secret arrangements between the Ministry of Finance, the central bank (Bank of

Italy) and each of the three main mixed banks. These arrangements avoided the collapse of the latter, weighed down by frozen assets of their borrowing firms. The three banks were required to limit their undertakings thereafter to self-liquidating loans, excluding any immobilization of industrial character, even under the form of stakes or advances. In turn, the three banks were freed both from their excessive debt burden towards the Bank of Italy and from their excessive credit exposure towards firms. All the industrial assets – shares but also credits – of the banks were in fact transferred to the Industrial Reconstruction Institution (IRI), created the previous year. Originally conceived as a temporary solution to Italy's industrial problems, IRI was supposed to restructure and recapitalise the main firms that came under its wing before they became newly privatized.

Another important actor was the *Istituto Mobiliare Italiano* (IMI), founded in 1931, which was supposed to guarantee long-term lending to firms, thus filling the void left by the crisis (and later the collapse) of mixed banking (Confalonieri 1983). In practice, however, few loans were extended by IMI, owing to the under-funding of the institution and to the strictly conservative outlook of its first managers. IMI was in fact not able, with its limited mission, to solve the intricate proprietary relationships between bank and industry which had been at the core of the crisis. For this purpose, the 1936 Banking Act was instead more effective.

The Act created a new regulatory authority, the Inspectorate for the Safeguard of Savings and for Credit Activity, subordinated to a Committee of Ministers led by the Prime Minister. Head of the Inspectorate was the Governor of the Bank of Italy and, *de facto*, the Inspectorate never operated separately from the bank of issue. The Banking Act had the explicit twofold aim of *a*) preventing banking instability and crises, via a large number of rules, all to be fine-tuned by the regulatory authorities, including a distinct separation between long-term and short-term credit institutions, as well as *b*) disciplining the credit function, *i.e.* allocating credit in the economic system.

Concerning the first point, the tight inter-relations between banks and industry were pinpointed as the main cause of the 1930s banking crisis, as the “root of all evil” (IRI 1937).<sup>2</sup> To avoid the recurrence of a similar crisis, the solution adopted was the sub-division of the banking system into two different sectors, insulated from one another, so that a crisis of one part would not necessarily expand to the other (Cassese 1988). The new perimeter of regulation included two separate categories of institutions, distinguished according to the maturity of their liabilities: short-term *vs.* medium/long-term. The former category included the three ex-mixed banks, savings banks and others. The latter category, later defined as *istituti speciali di credito* (“special credit institutions”), was made up of publicly controlled entities: IMI; Crediop; Icipu; *Istituto di credito*

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<sup>2</sup> See Barbiellini Amidei and Giordano (2013) on the comparative evolution of bank-industry and financial market ties in Italy and in the U.S. before and after the 1930s' bank regulation.

*navale*; *Istituto nazionale di credito per il lavoro italiano all'estero*, each devoted to special categories of borrowers (with the exception of IMI).

The idea was that of a “functional specialization according to maturity”: short-term liability credit institutions were to extend short-term loans, whereas medium and long-term liability ones were to extend medium and long-term loans. Whilst the 1934 *Convenzioni* explicitly forced the ex-mixed banks to respect this separation, the 1936 law was more subtle in stating that certain types of investments required the regulator’s authorization (Artt. 32, 33 and 35), in order to restrict risky investments by banks. The Committee of Ministers could also decide, according to the law, that certain types of investments had to be pre-emptively authorised by the Inspectorate.

When the 1936 law was passed, it was defined by some a “corporate credit statute” (Spinedi 1936, p. 88). The aim of the law was not only to intensify the supervision of the banking sector, but also to guide and coordinate the credit activity, aligning it with the “superior” interests of the national economy in an autarkic context. The Inspectorate’s instructions were supposed to funnel savings to the investments which were most compatible with Italy’s production needs, in order to foster economic development (Jacuzio 1936, p. 407; Fantini 1936, p. 340). The quantities of production in each sector were to be controlled via credit rationing or expansion (Miceli 1936). The contemporary economist Arias (1936) underlined how the corporate economy had entered into a reconstruction phase and, via the credit channel, aimed at rationalizing production.<sup>3</sup>

It was precisely to create the informational basis necessary to sustain a sectoral investment policy that the Bank of Italy started to collect annual data on the sectoral allocation of credit from all banks (via the so-called *modello 101*, a form to be filled in yearly by the banks), information which was then aggregated and sent to the Government. Their publication in the *Bollettino* of the Bank of Italy began as of 1947. Moreover, in 1951, fifteen years after the introduction of the 1936 Banking Act, long-term credit institutions were required to provide quarterly data on their loans by province (via the so-called *modello 143*).

This complex and impressive system, though, was not used in the late Thirties nor during the war to plan the economy. Other instruments – which were probably found more practical – were used instead, such as the authorisations to build new industrial plants, tariff barriers, the rationing of raw materials and of foreign currencies (Baffi 1986). IMI also had a role in the credit policy of the late Thirties and Forties (Farese 2009, to which we refer).

Notwithstanding WWII and the fall of the Fascist regime, the 1936 Banking Act and its ample, albeit partially unused, powers, survived (Gigliobianco and Giordano 2012; Barbiellini Amidei and Giordano 2013). Some alterations to the legal set-up were however made. In 1944 the

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<sup>3</sup> See Gigliobianco and Giordano (2012) for a detailed discussion of the influence of contemporary Italian economists on the 1936 Banking Act.

Inspectorate was abolished. In 1947, a functional separation between the direction of credit flows and general bank supervision (assigned to the Interministerial Committee for Credit and Savings, CICR, a governmental body) and day-to-day supervision of credit institutions (assigned definitively to the Bank of Italy) was introduced. The CICR was set under the chairmanship of the Minister of the Treasury; other ministers were also members of the Committee, whereas the governor of the Bank of Italy participated in its meetings. *De facto* a significant part of CICR works were prepared and oriented by Bank of Italy's preparatory dossiers.

Under authority derived from the CICR, the Bank of Italy, besides regulating the opening of new banks and new branches, could prescribe deposit and lending rates for banks, fix a wide variety of balance-sheet ratios, regulate commissions and service charges set by banks, impose rules regarding the allocation of bank credit to various economic sectors, and fix quantitative limits on bank loans of various types or on total bank loans. The central bank also regulated all new issues of bonds and stocks that were listed on any of the Italian stock exchanges or issued through any of the banking and credit institutions subject to the Bank's supervision.

In postwar Italy the volume of medium and long-term bank loans in specific areas was increased via the institution of an impressive amount of new specialised long-term credit institutions, notably the *Mediocrediti regionali*, the "special sections" of existing short-terms banks and many others (Table 1), as well as a generalised implicit guaranty on all bank deposits since many banks were controlled or owned by the State.<sup>4</sup> Furthermore, the distribution of long-term credit via these institutions could be affected by the Bank of Italy: since long-term credit institutions were mainly funded by bond issues and since the latter were subject to the central bank's authorization, the expansion of long-term credit institutions' activity could be controlled via the rationing of the bond issues (Cotula and Pado Schioppa 1971, p. 120).

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<sup>4</sup> See Barbiellini Amidei and Giordano (2013) for a discussion of Italy's implicit deposit insurance in the years under study.

**TABLE 1**  
**Special credit institutions in Italy, 1936-1979**  
*(stock at the end of each year)*

<b>Categories of credit institutions</b>	<b>1936</b>	<b>1950</b>	<b>1960</b>	<b>1970</b>	<b>1979</b>
Special credit institutions	4	9	22	23	23
Special sections	2	8	8	9	9
Land credit institutions	5	5	6	9	9
Special land sections	7	8	9	12	12
Public works sections	0	1	9	13	19
Rural credit institutions	5	5	6	6	6
Special rural sections	5	5	7	7	7
Total credit institutions	14	19	34	37	38
Total special sections	14	22	33	42	47
<b>TOTAL</b>	<b>28</b>	<b>41</b>	<b>67</b>	<b>79</b>	<b>85</b>

Source: Pontolillo (1980, p. 20).

Credit allocation policies concerned only long-term credit (except export credit, which was mainly short-term), and came basically in three forms, all aimed officially at fostering investment, especially in certain regions, of certain categories of firms (mainly small and medium enterprises) and in certain sectors and sub-sectors of economic activity<sup>5</sup>. The first form of policy was the selection of firms which could have access to the bond market (each issue of bonds, as well as of stock, had to be authorised by the above-mentioned CICR). By granting access to a limited number of firms, the policy allowed the selected ones to be financed at a rate lower than that which would have prevailed in a free market, and excluded others (Barbiellini Amidei and Impenna 1999, as well as several archival documents from the Bank of Italy's Historical Archives<sup>6</sup>). The second form was inducing the banks to buy certain types of bonds. This was done directly, by imposing certain shares on the asset side of the banks' balance sheets (*vincolo di portafoglio*, i.e. portfolio fetters), and

<sup>5</sup> The sectoral criterion was not frequent, but it can be found in some governmental decisions (Pontolillo 1980, p. 117). It ought to be noted that the socialist and especially communist opposition was a vocal supporter of using the powers of the 1936 banking law to plan the economy.

<sup>6</sup> Here we only cite a report of the Governor of the Central bank, Guido Carli, to the Director General of the Treasury, Gaetano Stamatì, dated 7 July 1969, in which the actual decision of allocating scarce funds through authorisations is clearly visible. The document is in Archivio Storico della Banca d'Italia, Direttorio-Carli, cart. 69, fasc. 7, s.fasc. 7.



indirectly, by allowing the banks to use (and sometimes arm-twisting the banks into use) certain bonds to build their mandatory reserves at the central bank. This created an incentive to buy those bonds, since, in principle, the mandatory reserves kept with the central bank earned a below-market interest rate.

The third form was special, subsidised credit (*credito agevolato*). Various forms of special, non-market long-term credit started in Italy around 1946, mainly aimed at the reconstruction of plants and housing damaged during the conflict. The amount of non-market credit declined as Italy progressed, reaching about one third of total long-term credit at the end of the Fifties. In the early Sixties several laws were enacted which put in place a new, complex system of credit subsidies. The subsidy was a State contribution to the payment of interests on medium and long-term loans. The amount of the contribution varied, but was generally between one half and two thirds of the market rate (Banca d'Italia, *Appendice*, various years; Pontolillo, 1971); often the State took on itself the risk of interest rate variability, leaving the borrower with a fixed-rate loan (Pontolillo 1980, 58). The loan contract had to be stipulated between the industrial firm seeking funding and the long-term bank; the bank would in turn receive (from one of several State agencies involved) the difference between the market rate and the “special” rate (Pontolillo 1980 describes the system in depth; a full description of the laws may be found on pp. 117-138). After the oil shocks, subsidised credit was also aimed at the reorganisation of the sectors which had been hardest hit by the crisis (Pontolillo 1980, 52). As two Italian economists and central bankers stated in 1971, “[t]he Government can, in fact, decide not only the level of subsidized rates, but also the categories of firms, the sectors of economic activity, and the geographical areas eligible for subsidized credit. This discretionary power can be used to implement a selective control of credit” (Cotula and Padoa-Schioppa 1971).

Some of the laws governing credit policies contemplated a further form of State intervention aimed at the same purpose, *i.e.* a lump sum given to the industrial firms which promised to undertake certain investments (usually the sum was a fraction of the approved investment). Technically, this was not credit, since no reimbursement was contemplated, and therefore the datasets which we use in this paper does not include it. Nevertheless, it is useful to know that credit policies were accompanied by these free handouts of money, framed within the same political-administrative context, which also contributed to lower the cost of capital. In fact, the agency for the development of the South (*Cassa per il Mezzogiorno*), which was a crucial node of the policy, awarded both things: interest payment contributions and lump sums.

Few years after its creation in the early Sixties, the system of subsidised credit started to be sharply criticised by competent observers. Certainly the most qualified of these critics was precisely the Governor of the Central bank, Guido Carli, who was in office between 1960 and 1975. A

statement by Carli drawn from his Final Considerations to the Bank of Italy Annual Shareholders' Meeting of 1965 clearly expresses his reservations concerning selective credit policies:

The growing participation of governmental bodies in the process of directing savings toward investment is often associated with public subsidies and guaranties for purposes which are deemed of public interest. But the lowering of the cost of capital and free handouts by the State dull the keenness of entrepreneurs to seek out ways of restricting the use of capital within the limits of true necessity. (...) Besides, the high level of debt with respect to one's own capital, when it reaches the point of affirming the uselessness of the latter, dismantles the risk factor which characterises and singles out private enterprise.

Even the bankers' activity (...) is influenced by the action of government bodies which decide on the granting of subsidies. The decision of such bodies does not imply a judgement on the ability of the firms to repay the loans, but it is certainly a fact that morally softens the responsibility of those who grant credit.

Incentive schemes are basically aimed at accelerating the economic process toward development, by both fostering the creation of new plants and inducing, in the existing plants, those modifications which are deemed conducive to higher productivity and to a better social set-up. However, the danger that, fearing the human costs which these transformations entail in their first stages, and bowing to the influence of pressure groups, subsidised credit and similar government provisions be used instead to sustain enterprises and set-ups threatened by changes in technologies, tastes and other market features or by bad management, is always lurking. These subsidies may, in fact, be used to attain narrow-scoped intents of protection and conservation, sacrificing the more important objectives. These observations should induce a re-examination of the system of subsidies in order to streamline it and to readdress it towards long-term objectives.

Indeed, the Bank of Italy found itself in an odd position. On one side, it devised appropriate technical solutions to implement the policies decided by the political authorities; on the other it did not tire of pointing out, in official reports such as the one just quoted, that the criteria which were being used in managing the system were transforming it in a bureaucratic wetland: a. entrepreneurs were turned away from risk and innovation and transformed into hunters of public subsidies; b. the long-term banks were *de facto* stripped of their characteristic function and turned into administrative bodies in charge of assessing the formal compliance of credit demands with the laws; c. the whole system was on its way of becoming a system of protection against change, instead of a stimulus to innovate; d. in some cases credit subsidies were used to attain different aims from those originally devised, so that the instrument used was not well suited to the aim; for example, subsidised credit to exporters was ill-fitted to help the economy of developing countries, because on one side the special contribution which bankers could give to the selection of borrowers was annulled, while on the other Parliament lost control of the amount of money being used: instead, Carli maintained, aid ought to be explicitly decided by Parliament, and credit decisions ought to be left to the banks (Carli 1966).

In time, during the Eighties and Nineties, as the informed public opinion became progressively more wary about State intervention, and the entrepreneurial nature of banks was stressed by academics and politicians alike, selective credit policies were gradually abandoned. No banking reform was enacted in this field however. Simply, the CICR and the bank of Italy used their powers ever less, the separation between long and short-term credit was allowed to blur, the laws which underlay selective credit policies were less abundantly financed by Parliament. Besides, the system underwent major regulatory and governance changes, which stressed the entrepreneurial responsibility of bankers: supervision was aimed at capital ratios and the adequacy of internal organisation rather than at mandating specific actions, while all banks were encouraged to become share companies and the State sold its banks on the market. In 1993, a new comprehensive banking law was enacted (“Testo unico bancario”), which included and coordinated all major (liberalising) legislation changes.

### **3. Credit and productivity: theory and empirical evidence**

The (causal) links between finance and economic growth are a highly debated issue. Here we focus our attention on the nexus between credit and productivity, in particular one of the proximate determinants of economic growth, *i.e.* total factor productivity (TFP) growth. In turn, the latter is one of the two components, together with the changes in capital intensity, of labour productivity growth, to which it is hence strongly correlated.

Financial intermediaries eliminate asymmetric information issues arising in the funding process and thereby lower the costs of researching potential investments, evaluating projects, exerting corporate control, managing and hedging risk, mobilizing savings, and facilitating exchanges.<sup>7</sup> Differences in how well financial systems reduce these information and transaction costs influence savings and allocation decisions, investment, technological innovation, and, as a result, long-run economic growth.

In the past two centuries, two “developmental” economists have been frequently cited by the supporters of credit policies as engines of growth: Henry de Saint-Simon and Joseph Shumpeter. Saint-Simon was the main modern supporter of a “democratic” view of investment and growth: since the ownership of capital depends on chance and family riches, both “irrational” ways of distributing resources to investors, an appropriate way of opening up economic possibilities to capable entrepreneurs is that of providing them with the money necessary to realize their projects. Who is going to select the capable entrepreneurs (or the worthier projects)? The *Crédit Mobilier*-type banks, would say the Pereire brothers in the 1920s; the State, would answer later technocrats.

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<sup>7</sup> See Pagano (1993) for a simple model of financial development as a reduction in transaction costs in the context of an AK model.

Joseph Schumpeter (1912) argued that the level of financial intermediary development affects the pace of productivity growth and technological change. In particular, he believed that well-functioning intermediaries encouraged technological innovation by identifying and funding the most promising entrepreneurs, who had the highest probability of successfully implementing innovative products and processes. In contrast, Joan Robinson (1952) declared that finance follows economic growth, in that economic development creates a demand for particular types of financial services and the financial system responds to these demands. Changes in economic systems can therefore spur financial development.

More recent economic theory has mainly provided a justification to the claim that credit affects growth. In this line of research, we focus on its impact on productivity. In particular, financial intermediaries can improve resource allocation due to their capacity to effectively acquire and process information concerning entrepreneurs' innovative activities (King and Levine 1993a) or the aggregate state of technology (Greenwood and Jovanovic 1990), and thereby to fund the most productive projects. Furthermore, high-return projects tend to be riskier than low-return projects. The ability of intermediaries to pool risks across many investment projects promotes growth by reducing risk, inducing a portfolio shift toward innovative projects in which individual investors may not have otherwise invested (Saint-Paul 1992; Devereux and Smith 1994; Obstfeld 1994). Finally, the presence of financial intermediaries reduces the need to hold savings in liquid but unproductive assets, and thus secures additional funds for investment in higher-return technologies (Bencivenga and Smith 1991, Levine 1991). From a theoretical standpoint, at least, the development of financial markets and institutions therefore seems to be one of the engines of economic growth, rather than a passive response to industrialization and structural change.

In a more microeconomic firm-level perspective, the Modigliani-Miller theorem (stated in Modigliani and Miller 1958; Miller and Modigliani 1961), which proves the irrelevance of the use of different financial sources for a firm's activity, may not hold in the presence of asymmetric information, irrational agents, or taxation. In one of these three cases, therefore, the availability of external financing may affect the level of firm investment (see, amongst many others, Myers 1984 and Myers and Majluf 1984, for the effect of informational asymmetries; Modigliani and Miller 1963 and Myers 1977 for the effect of taxation).

The empirical evidence on the subject also seems to conclude that there exists a significant relationship which goes from finance to productivity growth. It is way beyond the scope of this paper to review even only the main empirical (cross-country, case-study, industry- and firm-level) contributions on the credit-productivity link. However, we here summarize a few results. King and Levine (1993b) conduct a cross-country analysis of 80 countries in the period 1960-1989. They use

four indicators of the level of financial development: the liquid liabilities of the financial system on GDP; the ratio of bank credit to the sum of bank credit plus central bank domestic assets; the ratio of credit allocated to private enterprises to total domestic credit (excluding credit to banks); and the credit to private enterprises on GDP. They find that higher levels of financial development (measured by all four indicators) are positively associated with faster current, but also future, rates of economic growth, physical capital accumulation, and TFP growth. Thus, they conclude that finance does not only follow economic activity, but sustains it. As a result, insufficient financial development can create a “poverty trap”, hence becoming a severe obstacle to growth even when a country has established other growth-enhancing conditions, such as macroeconomic stability, openness to trade, educational attainment (Berthelemy and Varoudakis 1996). Similar to the results reported in King and Levine (1993b) are those found by Benhabib and Spiegel (2000), who however show that only the ratio of financial assets of the private sector to GDP positively affects TFP growth after accounting for factor accumulation. Levine, Loayza and Beck (2000) specify that the exogenous component of financial development is positively associated with economic growth; specifically, the large, positive link between the two is not due to potential biases induced by omitted variables, simultaneity or reverse causation. In a sequel to this paper, Beck, Loayza and Levine (2000) examine the channels through which financial intermediary development is associated with growth, arguing that the finance-growth nexus runs primarily through TFP growth and not through savings and physical capital accumulation. Finally, Cecchetti and Kharroubi (2012), relying on a sample of 50 advanced and emerging market economies in the period 1980-2009, relate financial sector size (measured both as private credit to GDP as well as the financial sector’s share in total employment) to aggregate growth: when private credit grows to the point where it exceeds GDP or when the financial sector represents more than 3.5% of total employment, finance becomes a drag on productivity growth, therefore pointing to the presence of an inverted U-shape effect of financial development. Furthermore, financial booms, measured as fast growth in either employment or value added, are found to be detrimental for real productivity growth.

Reverting once more to a microeconomic perspective, Fazzari, Hubbard and Petersen (1988)’s seminal empirical contribution on corporate finance finds that in imperfect capital markets internal and external finance are not in fact perfect substitutes. A pecking order in the ways to raise funds therefore arises as a result of the different cost of internal resources (cash flows, retained earnings, liquidity) relative to new debt or equity issuance. In turn, the preference for internal funding channels can constrain new investments. The presence of well-functioning financial intermediaries which mitigate the asymmetric information issues can however loosen up the firms’ financial constraints and spur investment in otherwise not undertaken productive projects.

Returning to more macroeconomic evidence, whereas the mentioned cross-country analyses seem to lead to the same conclusions of finance driving real growth (although it is not excluded that financial development may predict growth simply because financial systems develop in anticipation of future economic growth), time series studies instead lead to mixed results. Demetriades and Hussein (1996), for example, find considerable evidence of bi-directionality and some evidence of reverse causation (hence of economic growth leading to financial development) in the sample of 16 countries. Their financial indicators are the ratio of bank deposit liabilities to nominal GDP and the ratio of bank claims on the private sector to nominal GDP. Their findings also clearly demonstrate that causality patterns vary across countries and, therefore, highlight the dangers of statistical inference based on cross-section country studies which implicitly treat different economies as homogeneous entities. Luintel and Khan (1999) examine the long-run causality between financial development (proxied by the ratio of total deposit liabilities of deposit banks to one period lagged nominal GDP) and economic growth in a multivariate vector autoregression setting using data from ten less developed countries. They conclude that the causality between financial development and output growth is bi-directional for all countries. Christopolulos and Tsionisas (2004), among other things, use panel unit root and cointegration tests. They find that financial depth has a positive impact on output for the panel as a whole, as well as on a per country basis, thus contradicting the results in Demetriades and Hussein (1996) and in Luintel and Khan (1999). Furthermore, they find evidence of long-term causality. Finally, Neusser and Kugler (1998), differently to the previously mentioned studies, do not use financial balance sheet data, but national accounts data, to measure the level of financial development. They find that financial sector value added is positively cointegrated for most of fourteen OECD countries considered, not so much with manufacturing GDP but with manufacturing TFP. The causality then found from the financial sector to manufacturing growth is due to a (long-run) growth rather than a (short-run) cyclical effect. However, they also investigated whether there is a feedback from manufacturing TFP to financial intermediation activity, which seems indeed to be the case for several countries. The causal structure underlying the aggregate relationship between finance and growth thus varies widely across countries and points at the role played by historical and institutional factors in the interaction between the industrial and the financial sector.

In conclusion, whereas theory seems to support the cause of financial services positively affecting TFP growth and hence overall economic growth, and to find an empirical justification in cross-country growth regressions *à la* Barro, time series evidence leads to conflicting results for different countries. For Italy, one significant recent contribution in this second empirical field is a study by Battilossi, Gigliobianco and Marinelli (2012). It has the advantage of considering multiple

sectors of the Italian economy for a long time-span (60 years circa). By using cointegration techniques, they find a long-run relationship between the volume of bank credit directed to the various industrial sectors and the sectoral growth opportunities, proxied by sectoral price-earning ratios. In particular, they find that the banking system supported the real economy effectively in the 1948-1970 period, which has been defined Italy's Golden Age. In the Seventies and through the early Nineties, over-regulation, which had been a trait of the financial landscape since the Thirties, took on new forms and had an unprecedented (negative) impact on the sectoral allocation of credit. After the liberalisation and privatisation trends of the early Nineties, banks again reverted to directing credit to the most promising industries.

An even more focused stream of theoretical and empirical literature is interested in the effects of government subsidized credit on the behaviour of banks, and, as a result, on economic growth and welfare. Theoretical models give mixed results on the consequences of credit subsidization. An excellent survey may be found in De Bonis, Piazza and Tedeschi (2012) from which we here draw upon. Williamson (1994) finds that the effects of State intervention (such as direct government lending, loan guarantees, interest rate subsidies) are ineffective or welfare-diminishing in most, but not all, cases. Innes (1991)'s model shows that, by directing credit subsidies to low-quality entrepreneurs, a separating equilibrium with first-best investment choices by both high- and low-quality entrepreneurs may be attained. Gale (1989) finds that credit subsidies are welfare-improving if they reduce the probability of credit rationing. Ghatak, Morelli and Sjöström (2007) instead emphasize the companion issue of a selection effect on the entrepreneurial side, according to which credit subsidies can encourage less talented agents to become entrepreneurs, so that the average quality of entrepreneurs falls. From an empirical perspective, De Bonis, Piazza and Tedeschi (2008) provide evidence of the negative effect of subsidized loans on the screening behaviour of banks in Italy in the period 1984-1996 by employing province-level data. Subsidized loan programmes therefore deteriorated the quality of credit and was, according to their evidence, one of the factors that contributed to Italy's banking distress in the early 1990s. Subsidized credit was also found to be negatively correlated with provincial GDP per capita.

As will be shown in Section 5, our contribution to this empirical literature is based on panel cointegration techniques, similarly to Battilossi, Gigliobianco and Marinelli (2012), although we use actual growth indicators in lieu of potential growth ones. Furthermore, we are able to distinguish between short- and long-term credit, which is highly relevant in the Italian case, where the banking system was segmented, as described in Section 2. In particular we also break down our long-term credit data into ordinary and subsidized credit, in order to investigate whether we too find a negative link between Italy's credit subsidization programmes and economic growth in the

decades prior to the one analysed by De Bonis, Piazza and Tedeschi (2012). Finally, we explore both sectoral and regional dimensions, a feat which thus far has never been achieved in the literature.

#### **4. The sectoral data**

##### *4.1 The real economy by sector*

A significant portion of the period we are focusing on has been defined as a Golden Age for many European countries. In the Italian case, the years between 1951 to 1973 were truly golden, both relative to the country's historical record, but also in the international context, as Table 2 taken from Broadberry, Giordano and Zollino (2012) points out. Real GDP increased by 5.8 per cent yearly in Italy in the twenty years considered, with only Japan growing faster, and Germany just behind. These three countries were therefore rapidly catching up on the old and new technological leaders, respectively the United Kingdom and the United States. The Italian and German growth performances were explained mainly by total factor productivity growth, a proxy of technological development, organizational changes, efficiency gains, rather than by capital accumulation. After the oil shocks which hit the international economy at the onset of the 1970s, growth slowed down, more than halving in Italy. Relative to the most recent period, Italy's performance in productivity terms was still positive, but definitely not memorable anymore. Italy was however still progressing on its catching-up trajectory. Similar considerations may be made when considering labour productivity growth rates (notably highly correlated with TFP dynamics), but in order not to overwhelm the reader with figures, in this Table and the following, we prefer to focus solely on TFP growth trends.



**TABLE 2**  
**GDP and TFP growth in a sample of countries**  
*(percentage changes; yearly average in periods)*

<b>A. Italy</b>	<b>GDP</b>	<b>TFP</b>		<b>B. United Kingdom</b>	<b>GDP</b>	<b>TFP</b>
<b>1861-1881</b>	1.3	0.0		<b>1871-1891</b>	1.8	0.6
<b>1881-1911</b>	1.7	0.4		<b>1891-1911</b>	1.7	0.3
<b>1911-1938</b>	1.7	0.7		<b>1911-1950</b>	1.3	0.6
<b>1938-1951</b>	3.2	2.6		<b>1950-1973</b>	2.7	1.2
<b>1951-1973</b>	5.8	3.3		<b>1973-1990</b>	1.1	0.3
<b>1973-1993</b>	2.6	1.0		<b>1990-2007</b>	2.6	0.7
<b>1993-2007</b>	1.7	0.3				
<b>C. United States</b>	<b>GDP</b>	<b>TFP</b>		<b>D. Germany</b>	<b>GDP</b>	<b>TFP</b>
<b>1869-1889</b>	4.3	0.0		<b>1871-1891</b>	2.4	0.7
<b>1889-1909</b>	4.2	0.8		<b>1891-1911</b>	2.1	0.8
<b>1909-1950</b>	3.0	1.3		<b>1911-1950</b>	-0.3	0.6
<b>1950-1973</b>	3.6	1.4		<b>1950-1973</b>	5.4	7.0
<b>1973-1990</b>	1.5	0.0		<b>1973-1990</b>	4.6	2.3
<b>1990-2007</b>	3.1	0.9		<b>1990-2007</b>	0.6	1.5
<b>E. Japan</b>	<b>GDP</b>	<b>TFP</b>				
<b>1891-1911</b>	2.9	1.1				
<b>1911-1950</b>	2.4	0.4				
<b>1950-1973</b>	8.7	4.2				
<b>1973-1990</b>	3.8	0.8				
<b>1990-2007</b>	1.4	1.1				

Source: Broadberry, Giordano and Zollino (2012, p. 216)

Table 3, taken from Antonelli and Barbiellini Amidei (2007), focuses solely on Italy, by providing information on shorter sub-periods and, more importantly, disaggregated by economic sector. A sectoral analysis reveals in fact that TFP growth was even more impressive than aggregate trends for Italy in the industrial sector, and particularly in manufacturing, the true engine of Italy's post-WWII catch-up. Market services also registered strong growth in 1964-73, when the data are available. The slowdown after 1973 was instead severe in industry, but even more so in Italy's market services sector, which by that time was the largest in employment terms. Within industry, the energy sub-sector was not surprisingly the hardest hit, although also the construction industry suffered significantly. Manufacturing continued to hold the fort with strong productivity growth rates, although at an annual rate which was one third lower than the previous decade. Agriculture instead was not affected by any acceleration or deceleration of its yearly TFP growth rates, which remained steady around 2.6 per cent for the overall 1955-88 period. Data on labour productivity for

the same sectors (here not shown) portray the same ranking but with a (bit misleading) smaller dispersion of sector performances, in particular a lower than actual manufacturing lead.<sup>8</sup>

**TABLE 3**  
**TFP growth in Italy's economic sectors**  
*(percentage changes; yearly average in periods)*

Years	Agri- cultu re*	Energy *	Manufacturing	Construc- tion*	Total Industry	Market Services	Market economy	Non- farm market economy
<b>1951-63</b>	2.6	4.9	4.2	0.9	3.9	-	-	-
<b>1964-73</b>	2.5	3.5	4.9	0.7	3.3	4.2	4.0	3.7
<b>1974-88</b>	2.7	-3.1	3.3	-0.3	1.8	0.2	1.5	1.2
<b>1951-88</b>	2.6	0.8	4.0	0.3	2.9	-	-	-

\* The first available date is 1955.

Sources: Golinelli (1997), Antonelli and Barbiellini Amidei (2007).

Table 4 zooms in on Italy's manufacturing sector, which, as we have seen, was the driving sector in the country's development after WWII. Within manufacturing, productivity trends were highly heterogeneous, across sub-sectors, but also over time. On average in 1955-88, chemicals stood out as the most dynamic sub-sector, with annual TFP growth rates of nearly 9 per cent, and the mechanical sub-sector for the persistence of its productivity and value added growth which allowed it to increase its share of total manufacturing from 19 to 30 per cent. Most other sub-sectors displayed growth rates of 4 per cent, with the two disappointing exceptions of food, beverages and tobacco (3 per cent) and ferrous minerals (2 per cent). The sub-sectors considered may be grouped into modern (chemical, mechanical, transport equipment, rubber), traditional (food, textile and wood) and intermediate (ferrous minerals, non metallic minerals, rubber) categories. Modern industries shone relative to traditional industries only in the 1974-1988 sub-period, when TFP growth rates in the latter sectors slowed down significantly. In the previous years, both traditional and modern industries contributed on largely equal terms to aggregate manufacturing TFP growth. Intermediate sub-sectors underperformed relative to the other two categories in all sub-periods considered, due mainly to the mentioned ferrous minerals industry. The data on labour productivity for the manufacturing sub-sectors, here not shown, display the same ranking, even if the lead and

<sup>8</sup> A shift-share analysis conducted both on labour and total factor productivity growth in Antonelli and Barbiellini Amidei (2007) concludes that in the three decades analysed internal productivity growth within the three main sectors (agriculture, industry, market services) contributed more to the aggregate productivity growth than the effect of structural change, i.e. the shift of labour from a lower productivity level, such as agriculture, to a higher productivity level, such as industry and services. However, structural change in Italy was more relevant than in the other countries in the same period.

the progress of modern sectors result downplayed when the contribution of physical capital is not taken into account, while intermediate sectors are overrated.

**TABLE 4**  
**TFP growth within Italy's manufacturing sector**  
*(percentage changes; yearly average in periods)*

Years	Ferrous and non metallic minerals	Non metalliferous minerals	Chemical and pharmaceutical	Mechanical	Transport equipment	Food, beverage, tobacco	Textiles, apparel, footwear
<b>1955-63</b>	3.5	3.3	10.4	3.9	8.4	2.0	6.9
<b>1964-73</b>	-0.1	6.1	4.4	5.2	3.8	4.4	5.9
<b>1974-88</b>	1.9	1.9	10.8	3.8	1.4	2.6	2.8
<b>1955-88</b>	1.7	3.5	8.8	4.2	3.8	3.0	4.7

Cont.

Years	Wood, furniture	Paper and printing	Rubber	Total manufacturing	Modern sub-sectors§	Traditional sub-sectors°	Intermediate sub-sectors^
<b>1955-63</b>	3.5	4.3	-0.6	4.4	4.7	4.8	3.8
<b>1964-73</b>	5.7	5.0	8.1	4.9	5.2	5.2	3.2
<b>1974-88</b>	4.1	4.0	3.7	3.3	4.2	2.9	2.4
<b>1955-88</b>	4.4	4.4	4.0	4.1	4.6	4.1	3.0

§ Chemical, Mechanical, Transport equipment, Rubber; ° Food, Textiles, Wood; ^ Ferrous Minerals, Non metalliferous minerals, Paper.

Sources: Golinelli and Monerastelli (1997), Antonelli and Barbiellini Amidei (2007; 2011).

In our empirical analysis we will therefore focus mainly on Italy's industrial sector and manufacturing in particular for various reasons. Firstly, as we have seen, Italy's industrial sector was the most relevant in contributing to the country's overall development and innovation process in the period considered. Secondly, from a theoretical point of view, progress in technical knowledge, international technological transfers, their implementation through the adoption of increasingly cost-effective technologies embodied in machinery and equipment, and the internal diffusion of technology, key factors in productivity growth, are particularly evident in the manufacturing sector. Furthermore, as claimed also by Neusser and Kugler (1998) in their cited empirical analysis, innovative investment projects in manufacturing rely heavily on outside finance and are likely to face the principal-agent problems that financial intermediaries help mitigate. The last reason refers to data availability: the long-term sectoral credit data we match our productivity data with after 1973 includes, as well as that supplied by the long-term liability institutions, also that by special sectoral institutions (agriculture credit institutions, land credit institutions, etc), not considered instead in the period 1951-73. Since we assume that these special institutions provided

loans mainly to the agriculture and residential construction sectors, we choose to discard the latter in our analysis to avoid a break in our credit series data in 1973.

#### 4.2 Credit by sector

Turning therefore to our sectoral banking statistics, drawn mainly from the Banca d'Italia's annual *Bollettino*, we firstly consider the sectoral destination of (real) short-term credit by the Italian short-term credit institutions. Table 5 displays double-digit growth in yearly short-term credit supply both to industry and to market services in the period 1951-63. Even loans to agriculture grew at an impressive annual rate of 9 per cent. In the following decade, growth rates dropped by approximately one half in all sectors except for agriculture; credit to market services also still rose at the rate of 11 per cent per year. The true slowdown in short-term credit extension is however evident in the third sub-period (1974-88). Credit growth became negative in the energy sector, as did TFP growth, and was virtually nil in agriculture. Credit expansion was fastest in the market services sector (3 per cent yearly rate), but much slower than in previous decades. Overall, agriculture and then manufacturing were the sectors which in the thirty years considered registered the lowest annual short-term credit growth, market services the highest.

**TABLE 5**  
**Short-term credit growth in Italy's economic sectors**  
(percentage changes; yearly average in periods; 1948 constant prices)

Years	Agri- Culture *	Energy*	Manufact uring	Construc -tion*	Total Industry	Market Services	Market economy	Non- farm market economy
<b>1951-63</b>	9,2 (8,7)	18,6 (14,8)	12,5	17,7 (16,5)	13,5	15,2	13,2	13,7
<b>1964-73</b>	9,8	9,1	6,5	8,5	7,0	11,1	7,6	7,5
<b>1974-88</b>	0,4	-1,4	1,3	1,8	1,2	3,2	1,4	1,5
<b>1951-88</b>	5,8 (5,3)	7,9 (5,7)	6,4	8,8 (7,4)	6,7	9,2	6,9	7,1

\* The data in parenthesis is relative to the period starting in 1955.

Sources: our elaborations on Banca d'Italia, *Bollettino*, various years.

These short-term credit dynamics translated into an interesting evolution of sectoral shares in the period 1951-1988. In Fig.1 we therefore compute the sectoral credit shares and value added at current prices within the non-financial market economy of the main aggregate sectors. It is noteworthy that although (non-financial) market services had already become the largest sector in value added terms by 1951 (representing 35 per cent of total market economy value added at current

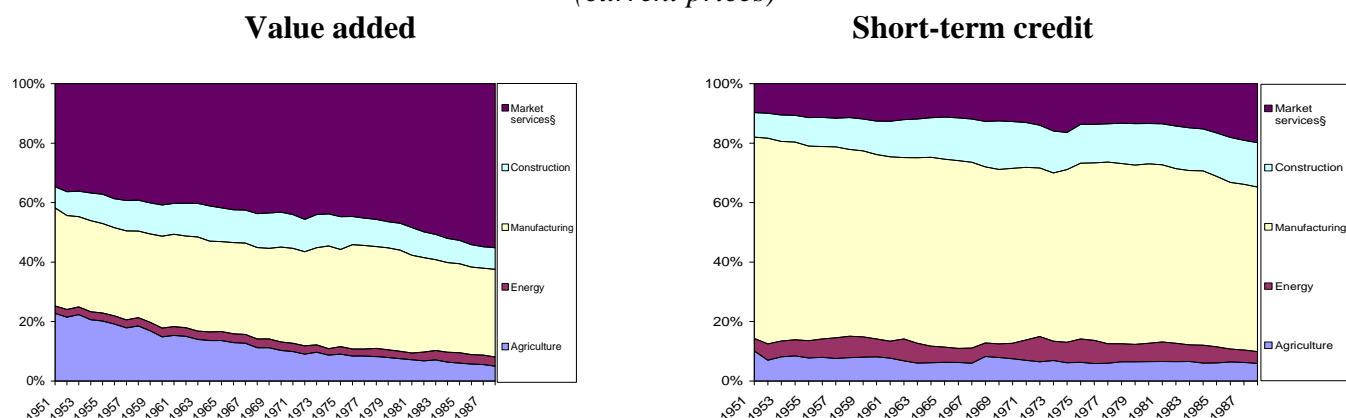
prices), manufacturing was the sector which received most (70 per cent) of the short-term loans supplied by Italian banks, much more than its value added share (30 per cent).<sup>9</sup> Over the period manufacturing's short-term credit share dropped to approximately 55 per cent, in favour of market services, but also of the construction industry, yet still remaining much higher than its counterparty share in VA. For energy and construction also, on the whole, short-term credit shares were higher than value added ones, while for agriculture the short-term credit share remained behind value added ones until the very end of 1980s.

By breaking down the manufacturing sector in Table 6, we notice that between 1955 and 1963 the growth in short-term loans to the traditional sub-sectors was half that of the modern ones and significantly lower than the intermediates; this evidence has to be matched with an initial very high traditional sub-sectors share of total short-term credit to manufacturing and much more than their value added share of manufacturing (to the detriment of modern sub-sectors, as will be shown in detail below). This downward trend, which stands out also in the overall period average, only inverted in the last sub-period when traditional sectors had a faster-growing stock of short-term credit than the modern industries, whereas it was depleting in the intermediate sub-sectors. From the individual sub-sectors' perspective, short-term loans annually increased at a double-digit rate in the first sub-period in all industries, except for food, beverage and tobacco. Once again, credit growth dropped in the following decade, but still grew at a higher yearly rate than 10 per cent in ferrous and non metallic minerals, chemicals, mechanical and rubber industries. Finally, after the oil shocks, growth rates dropped even further. Short-term loans to ferrous and non metallic minerals, non metalliferous minerals and rubber actually decreased. Only wood and furniture, textile and mechanical industries maintained a relatively fast credit growth (of 4 and 2 per cent respectively).

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<sup>9</sup> Note that in the original statistics credit to wholesale trade was partitioned across the various industrial sectors, hence credit to manufacturing was over-estimated. Only after 1983 did it form a new sector of its own. In order to attain comparability, we therefore re-assigned the amount of wholesale trade to the individual sectors in the period 1983-88.

**FIGURE 1.**  
**Sectoral Shares in Italy's Market Economy, 1951-88**  
*(current prices)*



Source: our elaborations on Golinelli (1997) and Banca d'Italia, *Bollettino*, various years; § non-financial.

**TABLE 6**  
**Short-term credit growth in Italy's manufacturing sector**  
*(percentage changes; yearly average in periods; 1948 constant prices)*

Years	Ferrous and non metallic minerals	Non metalliferous minerals	Chemical and pharmaceutical	Mechanical	Transport equipment	Food, beverage, tobacco	Textiles, apparel, footwear
1955-63	14,7	14,1	16,5	17,6	13,4	6,5	10,2
1964-73	10,0	3,7	11,1	10,1	5,0	0,8	7,9
1974-88	-1,5	-0,4	0,8	2,3	0,5	0,8	3,0
1955-88	5,9	4,3	7,7	8,4	5,0	2,2	6,2

Cont.

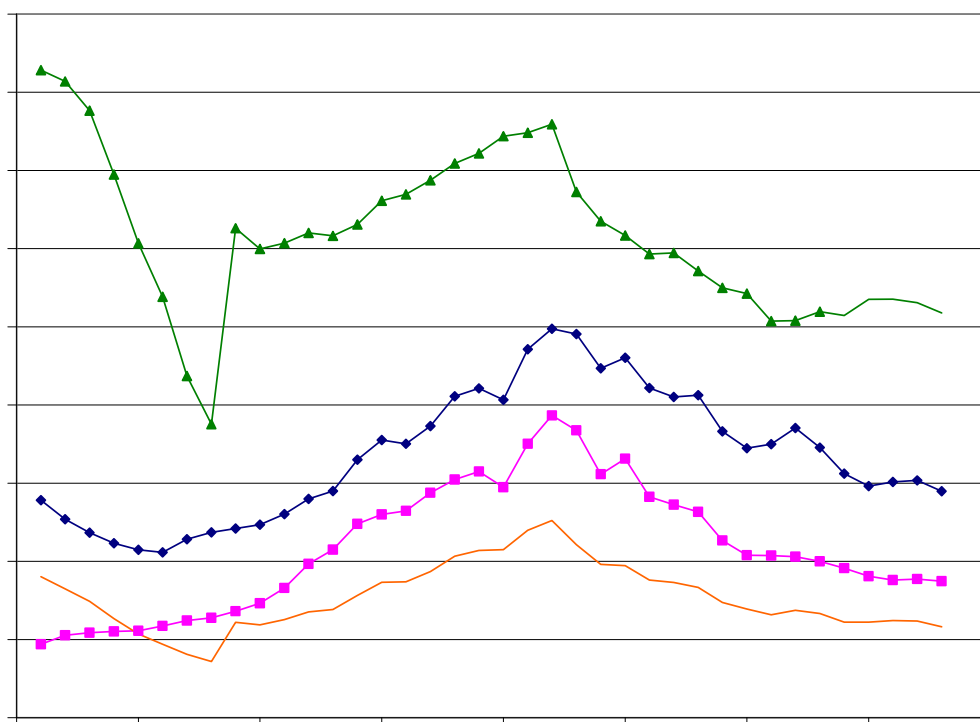
Years	Wood, furniture	Paper and printing	Rubber	Total manufacturing	Modern sub-sectors§	Traditional sub-sectors°	Intermediate sub-sectors^
1955-63	12,0	16,1	16,5	11,5	16,1	8,0	14,6
1964-73	6,3	8,4	12,2	6,5	9,3	3,5	7,6
1974-88	3,9	0,6	-6,0	1,3	1,4	2,2	-0,9
1955-88	6,6	6,7	5,0	5,4	7,3	4,0	5,5

§ Chemical, Mechanical, Transport equipment, Rubber; ° Food, Textiles, Wood; ^ Ferrous Minerals, Non metalliferous minerals, Paper.

Sources: our elaborations on Banca d'Italia, *Bollettino*, various years.

We now turn to long-term credit, disaggregated into its two components of subsidized and ordinary (not subsidized) credit. Owing to the previously mentioned reasons, for these banking statistics we only refer to manufacturing. As shown in Figure 2, total long-term credit was relevant both as a share of total credit to the manufacturing sector (between 20 to 50 per cent of short-term credit to manufacturing in 1951-88), and as a share of manufacturing value added (at current prices) in the whole 1951-88 (between 10 to 40 per cent). Within long-term credit, subsidized credit was the greater component for most of the time, in early 1950s and between mid-1960s and mid-1970s in particular (well above 60 per cent); on average, subsidised credit passed from 62 per cent of the total in the 1951-63 first sub-period, to 70 in 1964-73, to 55 in 1974-88.

**FIGURE 2**  
**Total Long-Term Credit to Manufacturing, 1951-88**  
*(percentage values)*



yearly), the expansion of long-term loans to the traditional sub-sectors was faster (in particular for the subsidized credit flows) than that of the modern and intermediate ones (contrary to what experienced for short term credit), while in the 1964-1973 period, with an almost halved manufacturing long-term loans' growth, the growth of the modern and intermediate sub sectors' long-term loans was significantly higher (especially thanks to subsidized credit dynamics) than for traditional ones (as for short term credit in the same years). In the last 1974-88 sub-period the growth of long-term credit actually turned negative, but much less sharply for traditional and modern sectors than for intermediate ones, mirroring somehow what registered for short-term credit.

The evolution of value added, of short-term and long-term credit shares (at current prices) within the manufacturing sector of the categories of sub-sectors – modern, traditional, intermediate, earlier defined – are displayed in Figure 3. The modern sub-sectors increased in fact in relevance over the three decades considered, although more in the case of short-term loans than value added (from 20 to over 45 per cent in short-term loans' terms, from 35 to 50 per cent in value added terms). Modern sectors' long-term credit share increased only moderately in the long run, starting however from much higher levels (more than 50 per cent of total manufacturing long-term credit in early 1950s), experiencing a downward trend until mid-1960s and a significant progress in the subsequent two decades (passing from 43 per cent of total long-term credit to manufacturing in 1967 to 57 per cent in 1988, over their 50 per cent value added share).

Conversely, while traditional sub-sectors experienced a drastic fall in their value added shares (from 40 to 30 per cent) and, again more spectacularly (from over 60 to 40 per cent) in short-term credit, relative to long-term credit, the traditional sub-sectors, starting from a much lower share (14 per cent in 1951), reached a maximum of 20 per cent at the end of the 1980s, still significantly less than their value added share. Finally, intermediate sub-sectors accounted for a (decreasing) 20-25 per cent of total value added in the overall period, a lower share (15-20 per cent) of short-term loans and a significantly higher long-term credit share (30-35 per cent until mid 1970s, still over 20 per cent, and more than their value added share at the end of the 1980s).



**TABLE 7**  
**Long-term credit growth in Italy's manufacturing sector**  
*(percentage changes; yearly average in periods; 1948 constant prices)*

Years	Ferrous and non metallic minerals			Non metalliferous minerals			Chemical and pharmaceutical		
	Subsidized	Ordinary	Total long term credit	Subsidized	Ordinary	Total long term credit	Subsidized	Ordinary	Total long term credit
1955-63	4	10,9	13,1	46,5	5,4	15,4	30,6	11,8	20,1
1964-73	23,4	6,6	17,3	10,9	0,8	9,4	19,3	2,4	14,6
1974-88	-9	-2,7	-7,5	-7,1	2,2	-1,1	-11,6	-2,4	-7,4
1955-88	4	3,6	5,3	12,4	2,6	6,4	8,7	2,7	6,3

Cont.

Years	Mechanical			Transport equipment			Food, beverage, tobacco		
	Subsidized	Ordinary	Total long term credit	Subsidized	Ordinary	Total long term credit	Subsidized	Ordinary	Total long term credit
1955-63	23,7	7,6	17,1	5,4	4,6	7,8	27,1	2	18,9
1964-73	14,7	2,7	14,6	12,2	2,3	11,5	7,1	3,1	9,1
1974-88	1,6	1,4	2,5	-3,8	-0,3	-2,2	0,4	2,3	2,6
1955-88	11,3	3,4	9,9	3,3	1,8	4,5	9,5	2,5	8,8

Cont.

Years	Textiles, apparel, footwear			Wood, furniture			Paper and printing		
	Subsidized	Ordinary	Total long term credit	Subsidized	Ordinary	Total long term credit	Subsidized	Ordinary	Total long term credit
1955-63	20,1	4,9	16,9	33,2	5,7	25,3	51,5	9,2	26,3
1964-73	11,8	3,1	12,1	12	0,3	11,6	8	2,2	8,0
1974-88	-6,1	-0,2	-3,6	-4,9	1,7	-1,2	-3,3	0,1	-1,8
1955-88	6,1	2,1	6,4	10,2	2,4	9,6	14,5	3,1	8,5

Cont.

Years	Rubber			Total manufacturing		
	Subsidized	Ordinary	Total long term credit	Subsidized	Ordinary	Total long term credit
1955-63	46,6	13,9	49,4	16,8	7,3	15,7
1964-73	27,7	17,7	31,9	14	3,2	13,0
1974-88	-2,6	0,5	-0,9	-4,2	-0,2	-2,4
1955-88	19,4	9,1	22,1	6,7	2,8	6,9

Cont.

Years	Modern sub-sectors§			Traditional sub-sectors°			Intermediate sub-sectors^		
	Subsidized	Ordinary	Total long term credit	Subsidized	Ordinary	Total long term credit	Subsidized	Ordinary	Total long term credit
<b>1955-63</b>	16,3	8,3	15,2	22,2	3,6	18,0	14,2	8,4	15,1
<b>1964-73</b>	16	2,8	14,3	9,9	2,8	10,8	15,5	4,3	13,6
<b>1974-88</b>	-3,1	-0,2	-1,8	-3,2	1,1	-0,7	-7,6	-1,1	-4,9
<b>1955-88</b>	7,7	2,9	7,4	7,4	2,2	7,7	5	3	5,8

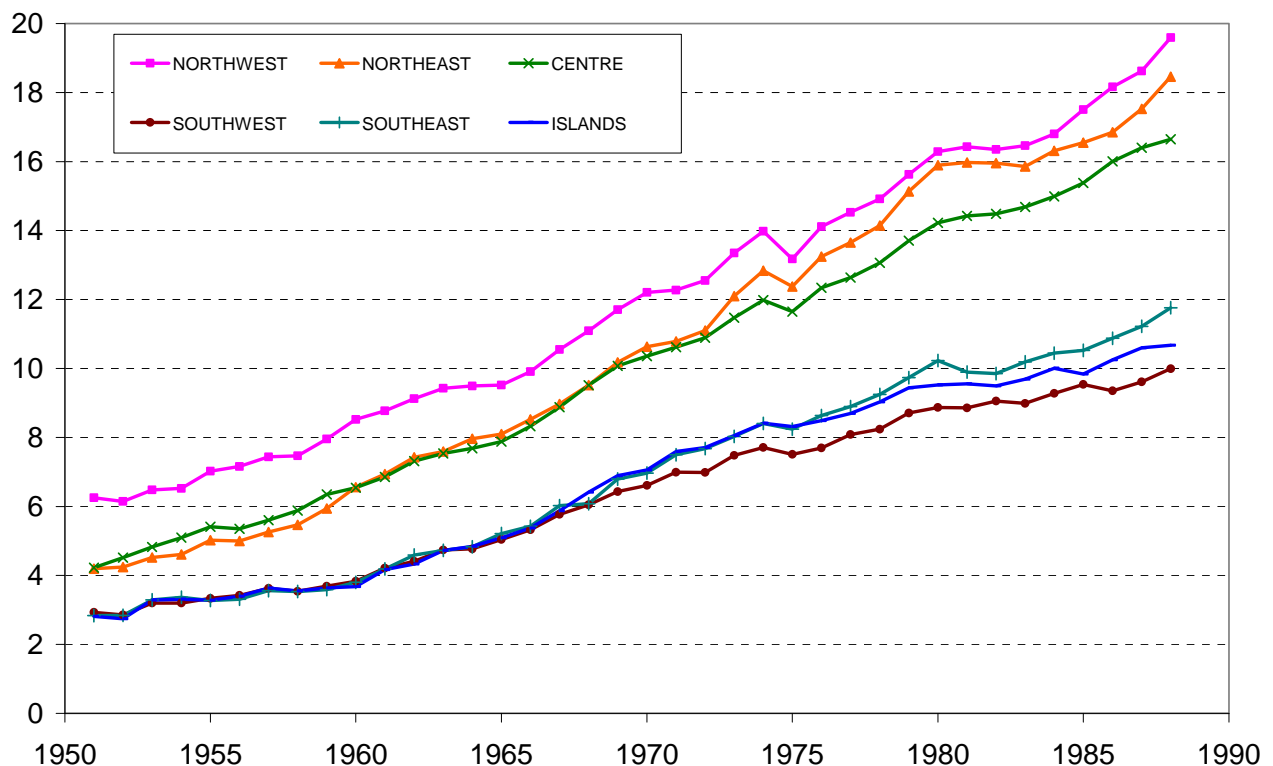
## 5. The regional data

### 5.1 Real economy by region

The real economy indicators we consider in order to have a picture of long-term structural change, coping with the problem of regional data availability (regional value added and capital/investment data for the industrial sector – and accordingly labour productivity and TFP – are in fact not available before 1960) are the regional labour participation rate, the regional industrial labour share and regional GDP per capita, which respectively proxy the rate of unemployment (inversely), the rate of industrialisation and the degree of economic development of each region.

As shown in Figure 4, relative to real regional GDP per capita we appreciate the significant differences existing between macro-areas at the beginning and at the end of the period under analysis. Southern Italy converged towards the North essentially in the 1960s and 1970s, with a significant contribution coming from South-Eastern regions, remaining at the end of 1980s with a 40 per cent gap. In the early 1980s instead North-Eastern regions had almost closed the gap with the North-West.

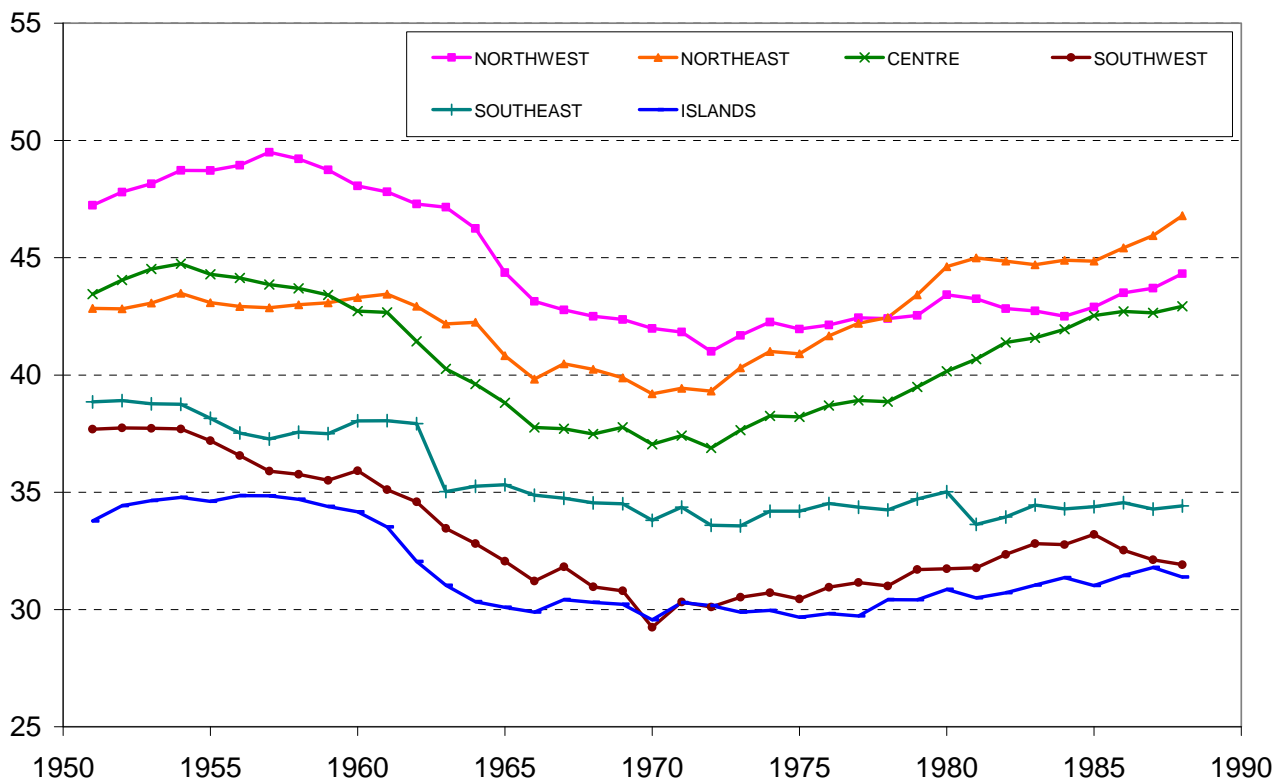
**FIGURE 4**  
**Regional GDP per capita, 1951-88**  
(constant 1985 prices)



Source: Paci and Saba (1997).

Looking, in Fig. 5, at regional labour participation rates (total employment to total resident population) again persistent differences between macro-areas emerge, along with a national downward long-run trend (and comparatively low levels): Southern regions lost ground relative to Northern ones, owing in particular to the retrenchment of the South-West. The gap of Central Italy was reduced but not closed in the long-run; the North-East instead took the lead as the area with the highest participation rate since the end of 1970s.

**FIGURE 5**  
**Regional labour participation rates, 1951-88**  
*(percentage values)*

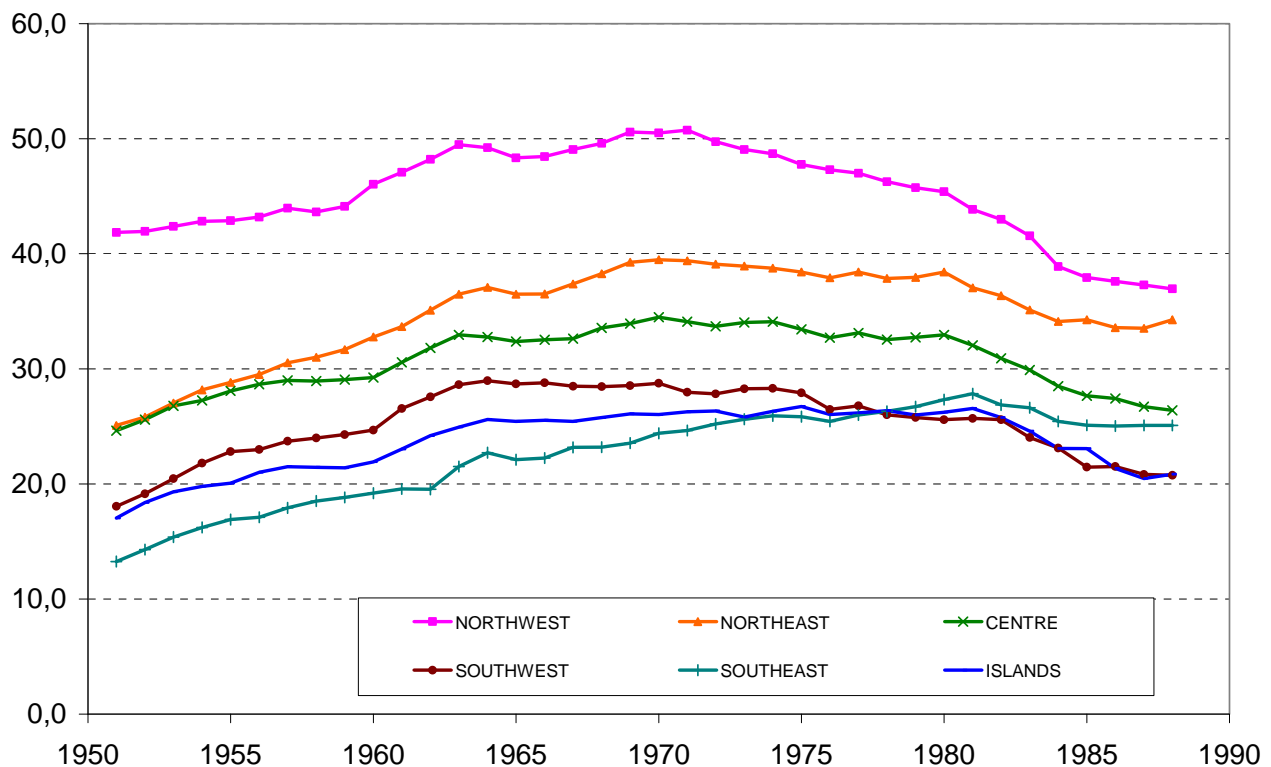


Source: Paci and Saba (1997).

As shown in Fig. 6 concerning regional industrial labour shares, which should proxy the rate of industrialisation, we appreciate the significant differences but also the relevant progress experienced by the South, which started with a share of industrial employed equal to less than half the one for North Italy and ended with a relevant but lower 35 per cent gap, owing in particular to South-Eastern regions in 1970s and 1980s. North-Eastern regions increased their industrial labour shares significantly in the long-run, while the North-West and Italy as a whole, after peaking in early 1970s, saw a retrenchment that brought at the end of 1980s the national share only marginally

above the one registered in early 1950s, notwithstanding the progresses (significant and modest) of all other areas.

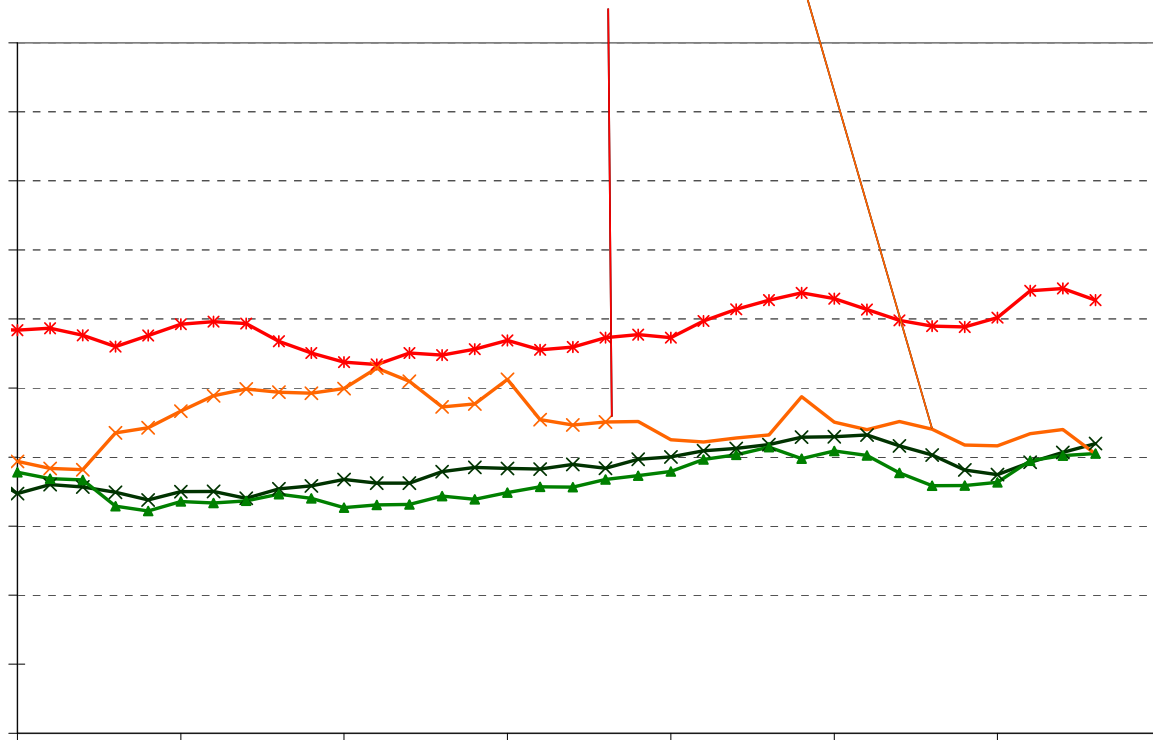
**FIGURE 6**  
**Regional industrial labour shares, 1951-88**  
*(percentage values)*



Source: Paci and Saba (1997).

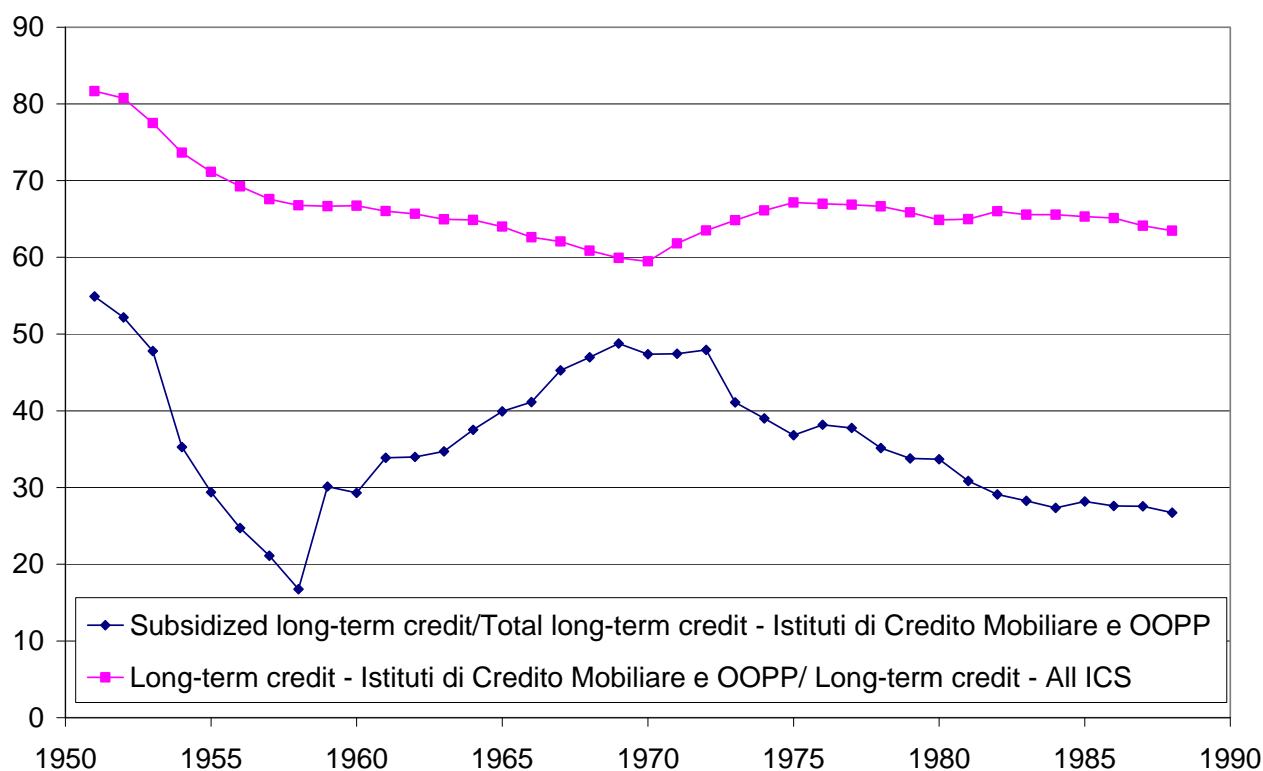
Finally, comparing the regional shares of total national industry employment to regional industrial value added shares since 1960, the first available year, significant and persistent differences between macro-areas come to light (Fig. 7): the North, owing to the North-West (and to a lesser extent to the North-East since the mid-1970s), had a higher share of national industrial value added than the equivalent industrial employment share throughout the whole period, with an increasing lead of the first on the second, signalling an increasingly more productive and/or more capital-intensive industrial structure than, in particular, the South.

**FIGURE 7**  
**Regional industrial labour and value added shares, 1951-88**  
*(percentage values)*



less than the equivalent share for the manufacturing sector alone, equal to 60 per cent (see above Figure 2).

**FIGURE 8.**  
**Long-term credit in our regional dataset**  
(percentage values)



Source: our elaborations on Banca d'Italia, *Bollettino*, various years.

At the beginning of the 1950s the North-West of Italy received nearly half of all *Istituti di Credito Mobiliare e alle OOPP*'s credit with in particular Lombardia obtaining 21 per cent, Liguria 13 and Piemonte 12. The first Southern region appearing in a descending ranking was Campania, fourth with 9 per cent after Lazio (12 per cent), while the other Southern regions all stood below 4 per cent. As shown in Table 8, moving from the first to the second phase of the Golden Age, the South got a much larger share of loans supplied by the *Istituti di Credito Mobiliare e alle OOPP*, in a period of fast expansion of long-term credit: passing from 22 per cent on average in 1951-1963 to 33 in 1964-1973, this result is to be attributed in particular to Puglia's and Sardegna's gains. The North-Western regions continued to receive the most part of this increasing long-term lending: 35 per cent in 1964-1973 (down from 39), while North-Eastern and Central Italy retrenched more severely, passing from 20 and 19 per cent respectively on average in 1951-1963 to 15 and 17 in

1964-1973. After 1973 instead, in a period of downsizing of the volumes of long-term credit, the big winners were the North-West, increasing its share to 40 per cent on average in 1974-1988, owing in particular to the rises accruing to Piemonte and to Lombardia (up to 23 per cent alone), and the Centre, passing to 21 per cent of total long-term loans. Conversely the North-Eastern regions (with the exception of Emilia Romagna) and especially Southern Italy lost ground, scaling down to 14 and 25 per cent respectively on average in 1974-1988.

**TABLE 8**  
**Total long-term credit of *Istituti di Credito Mobiliare e OOPP* to Italian regional areas**  
*(percentage values; yearly average in periods; current prices)*

Years	NorthWest	North East	Centre	South	SouthEast	SouthWest	Islands
<b>1951-63</b>	38,8	20,4	19,0	21,7	3,4	9,6	8,7
<b>1964-73</b>	34,7	15,5	17,1	32,8	10,3	9,9	12,6
<b>1974-88</b>	40,3	13,9	21,1	24,8	8,2	7,4	9,1
<b>1951-88</b>	38,3	16,5	19,3	25,8	7,1	8,8	9,9

Sources: our elaborations on Banca d'Italia, *Bollettino*, various years.

The 1960s decade was a period of rapidly increasing subsidised credit of the *Istituti di Credito Mobiliare e alle OOPP*, peaking at almost half of total long-term credit in 1969 up from around 30 per cent a decade before. As shown in Table 9, Southern regions benefited from a spectacular increase in their share – more than doubling it – of this enlarging subsidised cake, passing from 21 per cent on average in 1951-1963 to 49 in 1964-1973. The exceptional rises in subsidised loans of Puglia, Sardegna and Sicilia in particular explain the Southern lead in this type of credit. Mirroring the South's gains, the North-West lost the lead of subsidised credit, with its share falling to 27 per cent on average in 1964-1973, down from 47 in the first phase; Liguria was particularly hit, while other areas lost ground less dramatically. Moving to the 1970s-80s, Southern regions, the big winners of the previous phase, received less from a shrinking subsidised cake (reduced of almost one third, down to 32 per cent of total credit of the *Istituti di Credito Mobiliare e OOPP*), decreasing to 36 on average in 1974-88, and to a much lower 24 at the end of the period. The North-West regained its lead as the main subsidised long-term credit recipient (40 per cent in 1988), with a remarkable rebound of Lombardia (as well as of Veneto in the North-East). Grouping regions into 3 macro-areas, it is clear that over the whole period under study the share of subsidised loans on the total had an inverted U-shaped behaviour in the South, peaking in the mid-1970s, which was mirrored by a U development in the North; the share accruing to Central regions was instead broadly stable around 15 per cent over the entire period (Fig. 9).

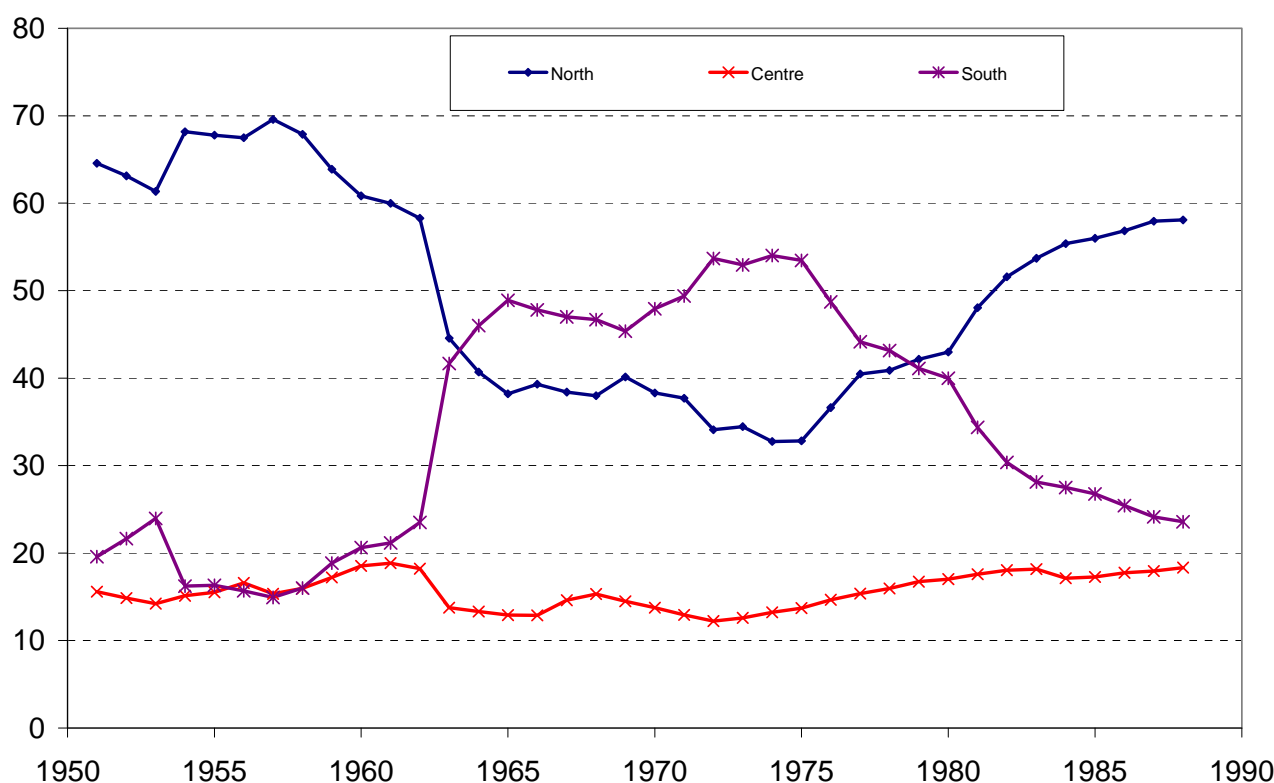


**TABLE 9**  
**Subsidised long-term credit of *Istituti di Credito Mobiliare e OOPP* to Italian regional areas**  
*(percentage values; yearly average in periods; current prices)*

Years	NorthWest	North East	Centre	South	SouthEast	SouthWest	Islands
<b>1951-63</b>	47,1	15,8	16,1	20,8	3,0	10,1	7,7
<b>1964-73</b>	26,7	11,2	13,5	48,6	15,0	14,5	19,0
<b>1974-88</b>	32,4	14,7	16,6	36,3	12,8	10,4	13,2
<b>1951-88</b>	35,9	14,2	15,6	34,2	10,0	11,4	12,8

Sources: our elaborations on Banca d'Italia, *Bollettino*, various years.

**FIGURE 9**  
**Subsidised loans to Italy's three macro-areas**  
*(percentage values, current prices)*



Sources: our elaborations on Banca d'Italia, *Bollettino*, various years.

If we finally turn to ordinary long-term credit, it is interesting to observe that this component constantly remained well above 50 per cent of the total since the early 1950s, and that North-Western regions never lost their lead in this particular kind of lending (Table 10), increasing gradually their share from one phase to the next – from 35 per cent to 41 in 1964-73 and to 44.5 per cent in 1974-88, almost twice the other macro-areas – both when the ordinary long-term credit was decreasing (in the 1960s, down from 67 per cent in 1951-63 to 55.5 of total MLT credit on average in 1964-73), and when it was enlarging (since 1973, up to 68.5 per cent, mirroring subsidised

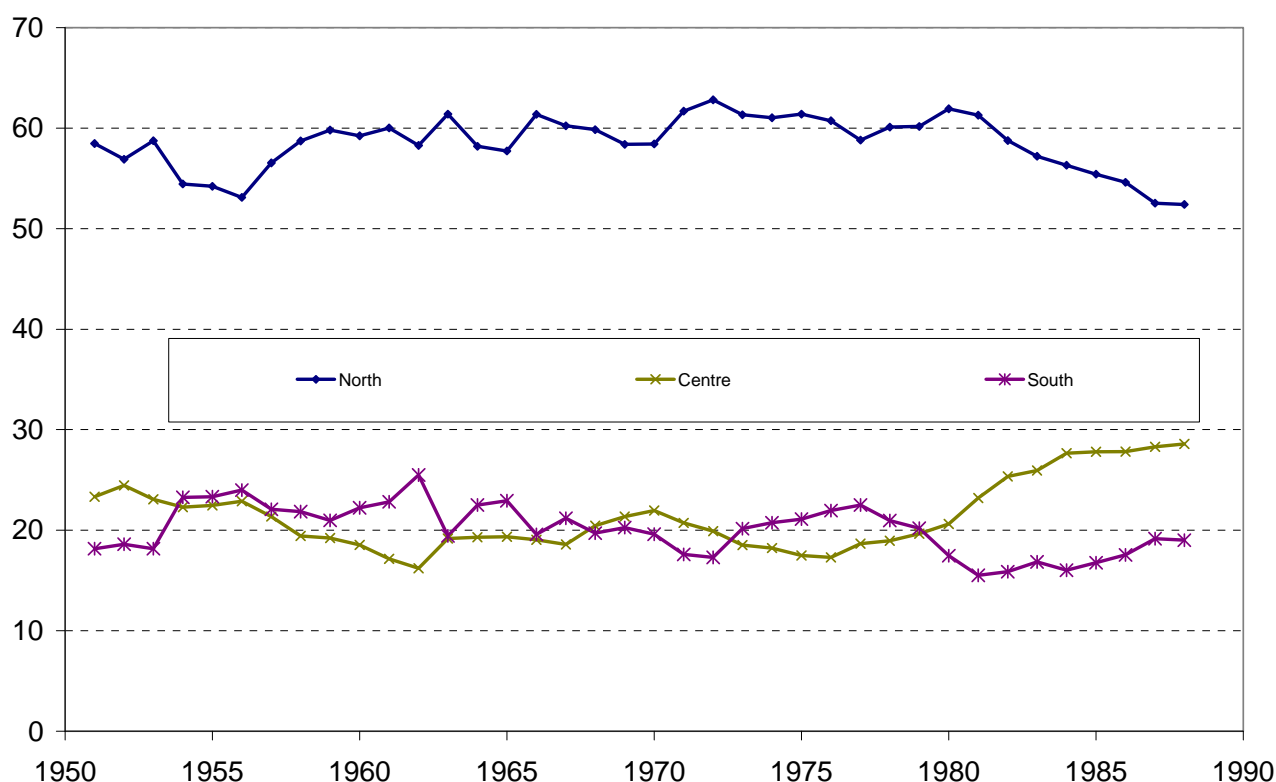
shrinking). Trends in the shares of ordinary long-term credit on the total were relatively stable over the whole period for each of the three macro-areas (Fig. 10), yet heavily biased towards the North to which 60 per cent of these funds were channelled. The South and the Centre equally shared the remaining 40 per cent.

**TABLE 10**  
**Ordinary long-term credit of *Istituti di Credito Mobiliare e OOPP* to Italian regional areas**  
*(percentage values; yearly average in periods; current prices)*

Years	NorthWest	North East	Centre	South	SouthEast	SouthWest	Islands
<b>1951-63</b>	34,7	22,9	20,7	21,6	3,4	9,3	8,8
<b>1964-73</b>	41,3	18,7	19,9	20,1	6,5	6,2	7,4
<b>1974-88</b>	44,5	13,7	23,0	18,8	5,9	5,9	6,9
<b>1951-88</b>	40,3	18,2	21,4	20,1	5,2	7,2	7,7

Sources: our elaborations on Banca d'Italia, *Bollettino*, various years.

**FIGURE 10**  
**Ordinary loans to Italy's three macro-areas**  
*(percentage values, current prices)*



Sources: our elaborations on Banca d'Italia, *Bollettino*, various years.

Focusing instead on the different regulatory/institutional sources of subsidised credit accruing to regions, we discover that in 1950s most funds were coming from *IMI's Gestioni Speciali* (at the onset mainly directly related to the Marshall Plan Aid) – among them the most

important were *Fondo ERP* and *Fondo Eximbank*, *Fondo lire acquisto macchinari*, *Finanziamento Area sterlina*, *Riconversione industriale*, *Fondo lire industrie siderurgiche* and *Fondo CECA* – and the *Fondo Industria Meccanica*. These funds were oriented mostly to big firms without any territorial orientation. IMI's Special Funds were predominant through the 1950s, totalling 80 per cent of total subsidised credit of all long-term credit institutions in 1951-1953 and 90 per cent in 1959. Later on, as result of a series of governmental actions, subsidised credit increasingly targeted small and medium-sized enterprises (SMEs) and the industrialization of the South, and as of the 1960s exporting firms (Table 11). Accordingly IMI's Special Funds share of total subsidised credit of the *Istituti di Credito Mobiliare e OOPP* dropped to 10 and 5 per cent in 1963 and in 1967-1969 respectively. Over half of IMI's Special Funds loans were accruing to North-Western regions in the 1950s and not much less in the 1960s, with Central and Southern Italy alternatively second or third recipient with shares of around 20 per cent each, while North-East was lagging behind (Table 12).

**TABLE 11**  
**Main aims of subsidised long-term credit - ICM e OOPP**  
*(percentage values; yearly average in periods; current prices)*

Years	SMEs	<i>Mezzogiorno</i> Industrialization	Exports	Fondo Nazionale Law	<i>Fondi</i> <i>Speciali</i> IMI	Other Subsidised*	Total
<b>1951-53</b>	2,1	6,7	-	-	80,4	10,8	100
<b>1963</b>	34,8	14,3	10,8	-	10,2	29,9	100
<b>1967-69</b>	33,5	21,0	11,3	-	4,8	34,2	100
<b>1971-73</b>	28,7	30,4	13,4	-	-	27,5	100
<b>1977-79</b>	22,1	29,6	17,2	2,1	-	29,0	100
<b>1980-88</b>	5,4	7,4	21,9	16,3	-	49,0	100

Sources: our elaborations on Banca d'Italia, *Bollettino*, various years. \* Includes FIM and since 1971 IMI Special Funds

**TABLE 12**  
**Fondi Speciali IMI subsidised long-term credit to Italian regional areas - ICM e OOPP**  
*(percentage values; yearly average in periods; current prices)*

Years	<i>Fondi Speciali</i> IMI credit on Total Subsidised	NorthWest	North East	Centre	South	SouthEast	SouthWest	Islands
<b>1951-53</b>	80,4	54,5	7,9	17,6	17,5	1,2	10,1	6,2
<b>1959</b>	90,3	52,6	12,1	16,7	18,5	1,5	11,2	5,8
<b>1963</b>	10,2	45,1	9,6	23,4	21,9	9,2	7,1	5,6
<b>1967</b>	4,8	54,6	7,6	15,2	22,7	15,7	4,1	2,9

Sources: our elaborations on Banca d'Italia, *Bollettino*, various years.

The component devoted to small and medium-sized enterprises (SMEs) started from a tiny 2 per cent of total subsidised credit in 1951-1953– as supplied through the 1950s by specialised sections of the three main *Istituti di Diritto Pubblico* of Central and Southern Italy (BNL, Banco di Napoli and Banco di Sicilia), and new *Mediocrediti regionali* developed in all regions –, to reach a remarkable 35 per cent in 1963 – under the new Law no. 623, July 30, 1959 and Law no. 549, July 25, 1961 –, remaining at 33.5 in 1967-1969 (Table 13). This kind of subsidised credit then decreased to 29 per cent in 1971-1973 and to 22 in 1977-1979, and to only 5 on average in 1980-1988, under the provisions of the same laws and institutions. In the 1980s, in order to appropriately evaluate subsidised credit devoted to SMEs, we also need to take into account the funds supplied according to the new Fondo Nazionale Law - Law no. 183, May 8, 1976, supposed to accrue mainly to SMEs especially in Northern and Central regions, while in the case of Southern regions eligibility criteria allowed bigger firms to receive funds – which resulted on average in 1980-1988 equal to 16 per cent of total subsidised credit; the old and new laws together should have probably supplied to SMEs a bit less than before, around or below 20 per cent of total subsidised credit.

**TABLE 13**  
**SMEs' subsidised long-term credit to Italian regional areas - ICM e OOPP**  
*(percentage values; yearly average in periods; current prices)*

Years	SMEs LT credit on Total Subsidised	NorthWest	North East	Centre	South	SouthEast	SouthWest	Islands
<b>1951-53</b>	2,1	22,4	8,3	15,0	52,9	9,3	17,6	26,0
<b>1971-73</b>	28,7	17,7	17,6	20,3	44,4	11,1	16,0	17,3
<b>1977-79</b>	22,1	22,4	24,2	24,7	28,7	8,6	11,3	8,8
<b>1980-88</b>	5,4	15,0	13,9	25,0	46,5	14,6	18,2	13,7
<b>1980-88*</b>	16,3	19,6	8,3	26,5	45,5	16,9	18,5	10,2

Sources: our elaborations on Banca d'Italia, *Bollettino*, various years. \* *Fondo Nazionale Law MLT Credit*

Turning to long-term credit for the South's industrialization, the other new main segment of subsidised credit, it began at 7 per cent of total subsidised loans in 1951-1953, to double to 14 in 1963, up to 21 in 1967-1969 and 25 in 1971-1973, to take the lead during the 1970s with 30 per cent on average in 1977-1979, down to 7 in 1980-1988, losing the lead in favour of credit to sustain exports (Table 14).<sup>12</sup>

**TABLE 14**  
***Mezzogiorno industrialization subsidised long-term credit to Italian regional areas***  
**- ICM e OOPP**  
*(percentage values; yearly average in periods; current prices)*

Years	<i>Mezzogiorno</i> Industrialization LT credit on Total Subsidised	North West	North East	Centre	South	SouthEast	SouthWest	Islands
<b>1951-53</b>	6,7	0,0	0,0	5,0	95,1	17,6	43,2	34,4
<b>1971-73</b>	30,4	2,5	0,0	7,7	91,5	33,6	18,0	39,9
<b>1977-79</b>	29,6	0,0	0,0	7,1	92,9	38,6	19,0	35,2
<b>1980-88</b>	7,4	4,2	0,3	9,2	90,1	47,5	18,6	24,0

Sources: our elaborations on Banca d'Italia, *Bollettino*, various years.

Long-term credit to exports – introduced in early 1960s (Law no. 635 of 1961) – already represented 11 per cent of total subsidised credit in 1963, it maintained this level in the late 1960s and early 1970s, to grow to 17 per cent in 1977-79, taking the lead among the main subsidised credit components in the 1980s, with 22 per cent of the total on average in 1980-88 (Table 15).

<sup>12</sup> Again in the 1980s, to appropriately evaluate subsidised credit exclusively devoted to the *Mezzogiorno*, we also need to take into account the funds supplied to bigger (than SMEs) firms in the South regions thanks to the wider (in respect to Northern and Central Italy) eligibility criteria of the new Fondo Nazionale Law; a part of the funds accruing to the South according to this law (7 per cent of total subsidised credit in 1980-1988) should be then added to the funds exclusively devoted to the South.

**TABLE 15**  
**Exports' subsidised long-term credit to Italian regional areas - ICM e OOPP**  
**(percentage values; yearly average in periods; current prices)**

Years	Exports LT credit on Total Subsidised	North West	North East	Centre	South	SouthEast	SouthWest	Islands
<b>1951-53</b>	-	-	-	-	-	-	-	-
<b>1971-73</b>	13,4	83,0	9,7	6,7	0,7	0,1	0,4	0,1
<b>1977-79</b>	17,2	71,0	6,9	19,6	2,4	1,6	0,6	0,3
<b>1980-88</b>	21,9	66,5	11,0	16,2	6,3	3,7	2,6	0,0

Sources: our elaborations on Banca d'Italia, *Bollettino*, various years.

In the early 1950s most of the still small amount of subsidised credit devoted to SMEs was accruing to Southern regions (53 per cent in 1951-53), with the North-West as a second recipient (22 per cent), followed by the Centre (15) and by North-Eastern Italy (8; Table 13). After two decades the South was still getting 44 per cent of a much bigger cake (representing in 1971 30 per cent of total subsidised credit and 12 of total long-term credit) – followed by the Central regions with 20 per cent and the North-West and the North-East with 18 each. At the end of the 1970s instead – when the amount of credit devoted to SMEs was still a significant 22 per cent of subsidised and 8 of total long-term loans – the South's share dropped to 29 per cent, tackled by the other areas (25 Centre, 24 North-East and 22 North-West in 1977-79). In the 1980s the South was again getting 33 per cent, while North-East and Centre retrenched slightly to 23 and North-West to 20. Again in the 1980s, in order to appropriately appraise subsidised credit devoted to SMEs, we also need to take in account the funds supplied to regions according to the new Fondo Nazionale Law, the biggest part of it was funnelled to the South (46 per cent of the Fondo Nazionale and 5 of total subsidised credit), while the Centre got 27 per cent, the North-West 20 and the North-East only 8 of these funds on average in 1980-1988.

If, trivially, almost all the credit for the *Mezzogiorno's* industrialization was accruing to Southern regions (a not negligible part, up to 10 per cent, was going to areas of Central Italy, notably to the Southern part of Lazio), in the early 1950s most loans were directed to the South-Western regions (over 43 per cent on average in 1951-53; Campania in particular), followed by the Islands (34 per cent; mainly Sicilia), while the South-Eastern regions were far behind (18 per cent of total credit for the *Mezzogiorno's* industrialization; Table 14). After two decades – when *Mezzogiorno's* credit was increased to a quarter of total subsidised credit – the Islands were getting the bigger part of it (40 per cent on average in 1971-73 most of which to Sardegna) and the South-

Eastern regions doubled their share (to 34 per cent) to the detriment of the South-West (down to 18 per cent). This pattern did not improve for the South-Western regions later in the 1970s (19 per cent in 1977-79), when the South-Eastern ones got the lead (39 per cent; Puglia receiving the most) ahead Islands (35 per cent on average in 1977-88). In the 1980s the South-Eastern regions were still getting the most (47.5 per cent; leaving 24 to the Islands and 19 to the South-West), of a much smaller cake.<sup>13</sup>

Finally, credit to exports was heavily concentrated throughout the period in favour of the North-Western regions (Table 15): in 1971-73, 83 per cent of the total (equal to the 11 per cent of all subsidised credit to Italian regions and 5 of total long-term credit in 1971-73) was accruing to the North-Western regions (55 to Lombardia alone), while the North-East was obtaining 9 per cent, the Centre 7 and the South less than 1; in 1977-79 the North-West was getting 71 per cent of total credit to exports (49 to Lombardia alone), while the Centre had almost tripled its share to 20 per cent (especially owing to an increase of funds to Toscana), the North-East only 7 per cent and the South 2; still in the 1980s the North-West was getting 67 per cent of total credit to exports (equal to 22 per cent of all subsidised credit to Italian regions and 6 of total long-term credit on average in 1980-88), the Centre 16, the North-East 11 and the South 6.

## 6. Econometric evidence on the rationale of Italy's postwar credit policies

In this section we first seek to investigate whether sectoral bank credit and real value added and productivity actually had a long-term relationship in Italy in the period 1951-1988. Our research strategy is as follows. First, we establish that the variables under investigation are non-stationary series, better characterized as integrated processes of order one, using conventional panel unit root tests. Next, we test for cointegration, in order to determine whether the sectoral credit (short-term and long-term, the latter in its two ordinary and subsidized components) and performance series (value added, labour productivity, total factor productivity) are cointegrated, i.e. they have a common linear relationship towards which they tend to adjust in the long run. Finally, we estimate a dynamic panel Error Correction Model (ECM) to identify if and how credit reacts to value added growth and productivity dynamics, and to disentangle long-term from business-cycle effects.

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<sup>13</sup> In order to appropriately evaluate how subsidised credit exclusively devoted to *Mezzogiorno* was partitioned among the Southern sub-areas, we also need to take into account a part of the funds supplied to the South according to the new Fondo Nazionale Law (46 per cent of the total supplied by the Law and 7 of total subsidised credit on average in 1980-88): these funds were funnelled on a more balanced base, 17 per cent to the South-East, 18 to the South-West and 10 to the Islands).

A similar strategy is applied to our regional dataset, yet with two variants: *a)* owing to the lack of available data of regional short-term credit before 1973, we focus solely on long-term credit, together with its two components (ordinary and subsidised); and *b)* the real economy indicators we consider are the labour participation rate (total employment to total resident population), the industrial labour share (labour employment to total employment) and GDP per capita, which respectively proxy the rate of unemployment (inversely), the rate of industrialisation and the degree of economic development of each region.<sup>14</sup>

## 6.1 Empirical evidence on sectors

Let us start by describing our *unit root tests* in our sectoral panel dataset. Consider the autoregressive (AR) model:

$$(1) \quad y_{it} = \alpha_{it} + \rho_i * y_{i,t-1} + \varepsilon_{it}$$

where  $\varepsilon_{it}$  is a mean-zero regression error term,  $i=1, \dots, N$  indexes sectors, and  $t=1, \dots, T$  indexes years. Most of the unit root tests we run investigate the null hypothesis  $H_0: \rho_i = 1$  (presence of a unit root, hence non-stationarity) versus  $H_a: \rho_i < 1$  (stationarity); conversely in the Hadri LM test the system of hypotheses is inverted.<sup>15</sup>

We conducted all the mentioned tests on our variables of interest. As clearly shown in Table 16 in which we present the p-values of the relative test statistics, for all sectoral variables we cannot reject the presence of a unit root at a 5 per cent confidence level for the overall period 1951-88, under most, if not all, the different model specifications.<sup>16</sup>

<sup>14</sup> Instead, regional value added, labour productivity and TFP data for the industrial sector are not available before the year 1960.

<sup>15</sup> In particular, the Levin-Lin-Chu (LLC) (2002) and Harris-Tzavalis (HT) (1999) tests assume that all sectors have the same autoregressive parameter, i.e. that  $\rho_i = \rho$  for all  $i$ . The alternative hypothesis is thereby simply:  $\rho < 1$ . The LLC test allows the number of time periods,  $T$ , to tend to infinity, whereas in HT  $T$  is fixed. The LLC and HT tests are based on regression t-statistics that are subsequently adjusted to reflect the fact that, under the null hypothesis of non-stationarity, the t-statistics have a non-zero mean because of the inclusion of panel-specific means or trends. The Breitung (2000) test instead transforms the data before computing the regressions so that the standard unmodified t-statistics may be used. The t-statistic may then be made robust to cross-sectional correlation of the regression error terms, option that we exploit. The Im-Pesaran-Shin (IPS) (2003) test relaxes the assumption of a common autoregressive parameter  $\rho$ . The null hypothesis is therefore that all panels have a unit root ( $H_0: \rho_i = 1$  for all  $i$ ). The alternative hypothesis is that the fraction of panels that are stationary is nonzero. This allows some (but not all) of the panels to possess unit roots under the alternative hypothesis. Fisher-type tests, which extend the Augmented Dickey Fuller test or the Philippe Perron test to panel data conduct unit-root tests for each sector individually, and then combine the p-values from these tests to produce an overall test. These tests also assume that  $T$  tends to infinity. Finally, as Hadri (2000) notes, classical hypothesis testing requires strong evidence to the contrary to reject the null hypothesis. Thus we may also want to conduct a test in which the null and alternative hypotheses are reversed. This is exactly what the Hadri LM test does, in that it has, as the null hypothesis, that all the panels are stationary, perhaps around a linear trend. The alternative hypothesis is that at least some of the panels contain a unit root.

<sup>16</sup> For long-term credit, being constrained by data availability, we consider the manufacturing sub-sectors time series only. Finally, given that most of the mentioned unit root tests require that the data be strongly balanced (with the exceptions of the IPS and Fisher tests), in the case of our TFP variable we only consider the period 1961-1988 for which we have observations for all sectors.



**TABLE 16**  
**Unit Root Test Results on Levels**  
*(p-values for seven alternative tests)*

Unit root tests	Levin-Lin-Chu	Harris-Tzavalis	Breitung	Im-Pesaran-Shin <sup>(a)</sup>	Fisher based ADF <sup>(b)</sup>	Fisher based on Phillips-Perron <sup>(b)</sup>	Hadri LM <sup>(c)</sup>
<b>VA</b>	0.0587	1.0000	0.9841	0.9345	1.0000	0.8907	0.0000
<b>LP</b>	0.3631	0.9768	0.6484	0.0609	1.0000	0.1713	0.0000
<b>TFP§</b>	0.0161	1.0000	0.2164	-	0.9994	0.3428	0.0000
<b>Short-term credit</b>	0.0045	1.0000	0.9993	0.8953	1.0000	0.9950	0.0000
<b>Ordinary long-term credit*</b>	0.2029	0.7428	0.6431	0.1389	0.9819	0.9183	0.0000
<b>Subsidized long-term credit*</b>	0.9995	1.0000	0.9686	1.0000	0.9970	0.9967	0.0000

(a) The p-value presented is related to the Z-t-tilde-bar statistic.

(b) The p-value presented is related to the P statistic, which requires a finite number of panels, as is our case.

(c) Recall that in the Hadri LM test the system of hypotheses is inverted. See text.

§ 1961-1988; \* Manufacturing sub-sectors.

Having ascertained that our series all present a unit root, the next step is to verify that they are integrated of order one. In order to do this, we simply run the same battery of test on the first differenced values of our variables. As shown in Table 17, which contains the p-values of the relevant test statistics, we reject the hypothesis of non-stationarity.<sup>17</sup> Hence, we conclude that both our credit and output indicators are I(1) series.

<sup>17</sup> For the TFP variable we considered the 1962-88 period so as to obtain a balanced panel.

**TABLE 17**  
**Unit Root Test Results on First Differences**  
*(p-values for seven alternative tests)*

Unit root tests	Levin-Lin-Chu	Harris-Tzavalis	Breitung	Im-Pesaran-Shin <sup>(a)</sup>	Fisher based ADF <sup>(b)</sup>	Fisher based on Phillips-Perron <sup>(b)</sup>	Hadri LM <sup>(c)</sup>
<b>VA</b>	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.1478
<b>LP</b>	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0129
<b>TFP§</b>	0.0000	0.0000	0.0000	-	0.0069	0.0000	0.2383
<b>Short-term credit</b>	0.0000	0.0000	0.0000	0.0000	0.0234	0.0000	0.0645
<b>Ordinary long-term credit*</b>	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.9383
<b>Subsidized long-term credit*</b>	0.0001	0.0000	0.0007	0.0000	0.0000	0.0000	0.0000

(a) The p-value presented is related to the Z-t-tilde-bar statistic.

(b) The p-value presented is related to the P statistic, which requires a finite number of panels, as is our case.

(c) Recall that in the Hadri LM test the system of hypotheses is inverted. See text.

§ 1961-1988; \* Manufacturing sub-sectors.

Now consider the following autoregressive distributive lag (ARDL) dynamic panel specification:

$$(2) \quad y_{it} = \sum_{j=1}^p \lambda_{ij} y_{it-j} + \sum_{j=0}^q \delta_{ij} x_{it-j} + \mu_i + \varepsilon_{it}$$

Where i indicates the sector, t the year, and  $\mu_i$  is a sector-specific effect.

Equation (2) may be re-written in *error-correction form*:

$$(3) \quad \Delta y_{it} = \phi_i (y_{it-1} - \theta x_{it}) + \sum_{j=1}^{p-1} \lambda_{ij}^* \Delta y_{it-j} + \sum_{j=0}^{q-1} \Delta x_{it-j} + \mu_i + \varepsilon_{it}$$

where the variables in levels are I(1), as is our case, and where:

$$\phi_i = -(1 - \sum_{j=1}^p \lambda_{ij});$$

$$\theta_i = \sum_{j=0}^q \delta_{ij} / (1 - \sum_{k=1}^p \lambda_{ik});$$

$$\lambda_{ij}^* = - \sum_{m=j+1}^p \lambda_{im};$$

$$\delta_{ij}^* = - \sum_{m=j+1}^q \delta_{im}.$$

$\phi_i$  provides an estimate of the speed of error-correction/adjustment of the system towards the long-run equilibrium after a sudden shock and  $\theta_i$  is the long-run, cointegrating coefficient. In short, error correction techniques preserve the information about both forms of covariation that two I(1) cointegrating series present: the long-run relationship (i.e. the manner in which the two series drift together) and the short-run dynamics (i.e. the relationship between deviations of one series from its long-run trend and deviations of the second series from its long-run trend). The error correction model is in fact internally consistent only if the two variables are cointegrated (otherwise the equilibrium error would not be I(0), although the left-hand side of the equation would be).

Before estimating the model we therefore need to establish that indeed cointegration between sectoral credit and each of our performance indicators is a characteristic of the data. We implement the four *panel cointegration tests* developed by Westerlund (2007). Instead of repeating a univariate cointegration test for every sector in the sample, each time using only the sample information for that particular sector, these tests account not only for the time-series but also for the cross-sectional dimension of the data. The underlying intuition is to test for the absence of cointegration by determining whether the error correction term in model (3) is zero: this implies testing the null hypothesis  $\phi_i = 0$  for all  $i$  (no cointegration). Two of the tests, called *group-mean tests*, present the alternative hypothesis  $\phi_i < 0$  for at least one  $i$  (i.e. they test the alternative that at least one sector is cointegrated). The remaining two tests, called *panel tests*, set the alternative hypothesis:  $\phi_i = \phi < 0$  for all  $i$  (i.e. they are designed to test the alternative hypothesis that the panel is cointegrated as a whole). We run the four tests under three model specifications (with constant and trend; with constant; no constant, no trend).<sup>18</sup> For brevity's sake we only report the p-values of the last model specification in Table 18, which anyhow broadly concur with the other two.

Short-term credit is cointegrated with value added only, as the hypothesis of no cointegration between short-term credit and productivity cannot be rejected consistently. In the case of long-term credit, we obtain instead that for ordinary long-term credit the null hypothesis of no cointegration is rejected for both value added and labour productivity, while for subsidized credit cointegration only with value added emerges. These results are plausible since short-term credit should be used to finance the working capital of a firm and is hence related to the quantity of goods and services produced. Long-term loans should instead be also related to productivity measures, which in turn should be related to investment plans, innovation, organizational changes, growth and earning prospects.

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<sup>18</sup> In particular, model (3) is written under the assumption of no deterministic component. It may be generalised by adding on a sixth component ( $\delta d_t$ ) where  $d_t$  can be a constant or a vector which includes both a constant and trend.

**TABLE 18**  
**Cointegration Test Results**  
*(p-values for four alternative tests)*

**a) Short-Term Credit**

<b>Westerlund test statistics</b>	<b>Gt</b>	<b>Ga</b>	<b>Pt</b>	<b>Pa</b>
<b>VA</b>	0.007	0.694	0.000	0.000
<b>LP</b>	0.997	1.000	0.997	0.991
<b>TFP</b>	1.000	1.000	1.000	1.000

**b) Ordinary Long-Term Credit**

<b>Westerlund test statistics</b>	<b>Gt</b>	<b>Ga</b>	<b>Pt</b>	<b>Pa</b>
<b>VA</b>	0.000	0.428	0.000	0.001
<b>LP</b>	0.010	0.038	0.005	0.004
<b>TFP</b>	0.713	0.947	0.317	0.806

**c) Subsidised Long-Term Credit**

<b>Westerlund test statistics</b>	<b>Gt</b>	<b>Ga</b>	<b>Pt</b>	<b>Pa</b>
<b>VA</b>	0.037	0.756	0.000	0.009
<b>LP</b>	0.796	0.976	0.843	0.760
<b>TFP</b>	0.997	1.000	0.995	0.997

Notes: Gt and Ga are group-mean tests; Pt and Pa are panel tests.

We now estimate our ECM model (equation 3), in which our dependent variable in our first estimation is respectively short-term credit and long-term credit, in its two ordinary and subsidized components, and our independent variable is, alternatively, value added, labour productivity and TFP. Starting with short-term credit, we find evidence of cointegration only with value added, hence  $\phi_i$  is different from zero in this case. We consider three possible model specifications. A fixed-effects (FE) approach pools the time-series data for each group and only the intercepts are allowed to vary across groups. The mean group (MG) estimator implies that the model is fitted separately for each group, and a simple arithmetic average of the coefficients is then computed. It allows the intercept, short- and long-run coefficients, and error variances to differ across the groups. The pooled mean group (PMG) estimator is an intermediate estimator which combines both pooling and averaging. Differently to the MG estimator, it constrains the long-run coefficients to be equal across groups. A Hausman test conducted on our data points to the PMG and FE estimators as being inconsistent, hence in Table 19 we only present the MG estimation results, for all our manufacturing sectors. The estimated long-run value added elasticity is statistically significant and positively signed (row 1). It is also large in magnitude. The speed of adjustment parameter (row 2)

is also significant and correctly signed.<sup>19</sup> Finally, in the short-run, value added and short-term credit are also related (row 3), yet the magnitude of the short-run coefficient is half that of the long-run one.

**TABLE 19**  
**Short-Term Credit vs. VA, Mean Group Estimation: Error Correction Form**

<b>diff_ln_short-term credit</b>	<b>Coef.</b>	<b>Std. Err.</b>	<b>Z</b>	<b>P&gt; z </b>	<b>[95% Conf. Interval]</b>	
<b>EC ln_va</b>	1.4056	0.4577882	3.07	0.002	.5083517	2.302849
<b>SR Ec diff_ln_va</b>	-.1436133 .5197671	.0295609 .1073908	-4.86 4.84	0.000 0.000	-.2015516 .3092849	-.0856749 .7302492
<b>_cons</b>	-.3657778	.3079541	-1.19	0.235	-.9693566	.2378011

Turning to ordinary long-term credit, in the manufacturing sector we find evidence of cointegration both with value added and labour productivity; relative to TFP, evidence of cointegration is limited to some (relevant) modern sub-sectors (such as transportation equipments and rubber). In Table 20 we present the MG estimation results. In the long-run both value added and labour productivity estimated long-run elasticities, with respect to ordinary long-term credit, are statistically significant, positively signed and large in magnitude (in row 1 of Table 20, Panel A and B). These positive cointegrating coefficients mean that in the long-run a higher amount of ordinary long-term credit was granted to those sectors that realized higher growth and productivity gains, possibly signalling an efficient working of the ordinary long-term credit channel to investment funding. The speed of adjustment parameters (rows 2) are also significant and correctly signed. Interestingly the estimated speeds of adjustment imply quite sluggish (four, five-year period) convergence towards the long-run equilibrium whenever a shock has occurred. The estimated short-run elasticities of both value added and labour productivity are significant (rows 3). Again we only present the MG estimation results as the Hausman tests point at this as the better estimator. Very similar results were obtained with respect to the TFP variable, but using a (consistent) PMG estimator.

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<sup>19</sup> This parameter is expected to be significantly negative under the prior assumption that the variables show a return to a long-run equilibrium.

**TABLE 20**  
**Ordinary Long-Term Credit vs. VA and Labour Productivity, Mean Group Estimation:**  
**Error Correction Form**

**Panel A**

<b>diff_ln_ordlong-term credit</b>	<b>Coef.</b>	<b>Std. Err.</b>	<b>z</b>	<b>P&gt; z </b>	<b>[95% Conf. Interval]</b>	
<b>EC</b>						
<b>ln_va</b>	1.154533	.1979289	5.83	0.000	.7665998	1.542467
<b>SR</b>						
<b>ec</b>	-.2560281	.0446225	-5.74	0.000	-.3434867	-.1685695
<b>diff_ln_va</b>	-.4141765	.1750861	-2.37	0.018	-.7573389	-.071014
<b>_cons</b>	-2.315368	.7320164	-3.16	0.002	-3.750094	-.8806423

**Panel B**

<b>diff_ln_ordlong-term credit</b>	<b>Coef.</b>	<b>Std. Err.</b>	<b>z</b>	<b>P&gt; z </b>	<b>[95% Conf. Interval]</b>	
<b>EC</b>						
<b>ln_labprod</b>	.963859	.2421688	3.98	0.000	.4892169	1.438501
<b>SR</b>						
<b>ec</b>	-.2055746	.0398316	-5.16	0.000	-.2836431	-.1275061
<b>diff_ln_labprod</b>	-.7285194	.2353963	-3.09	0.002	-1.189888	-.2671512
<b>_cons</b>	.0968402	.1324071	0.73	0.465	-.1626729	.3563532

Finally, looking at subsidized long-term credit, we find evidence of cointegration only with value added. However, with respect to subsidized long-term credit we do not find a statistically significant long-run elasticity for this variable (row 1, Table 21). Subsidized long-term credit is related with value added only in the short-run (row 3), while the short-run error correction term (row 2) is significant and correctly signed, but very small in magnitude, implying a low reactivity to shocks. Concerning long-term credit as a whole, having found evidence of cointegration with value added and labour productivity, again via a MG estimation we obtain a statistically significant positive long-run elasticity of value added only (results not displayed).

**TABLE 21**  
**Subsidized Long-Term Credit vs. VA, Mean Group Estimation:**  
**Error Correction Form**

diff_ln_sublong-term credit	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
<b>EC</b> <b>ln_va</b>	1.223232	2.949411	0.41	0.678	-4.557508	7.003972
<b>SR</b> <b>ec</b> <b>diff_ln_va</b>	-.0492505	.0170548	-2.89	0.004	-.0826774	-.0158237
	.270423	.1630467	1.66	0.097	-.0491427	.5899888
<b>_cons</b>	.3710835	.2896186	1.28	0.200	-.1965586	.9387256

## 6.2 Empirical evidence on regions

Moving to our regional dataset, we again ascertain the non-stationary nature of all the variables of interest (ordinary and subsidised long-term credit; the three above-mentioned structural indicators). Unit root tests in Tables 22 and 23 identify these series as I(1).

**TABLE 22**  
**Unit Root Test Results on Levels**  
*(p-values for seven alternative tests)*

Unit root tests	Levin-Lin-Chu	Harris-Tzavalis	Breitung	Im-Pesaran-Shin <sup>(a)</sup>	Fisher based ADF <sup>(b)</sup>	Fisher based on Phillips-Perron <sup>(b)</sup>	Hadri LM <sup>(c)</sup>
<b>Activity rate (l_pop)</b>	0.0000	1.0000	0.7503	0.0000	0.4341	0.2432	0.0000
<b>Industrial labour share (lind_l)</b>	0.0000	1.0000	0.9383	0.0004	0.3308	0.0140	0.0000
<b>GDP per capita (gdp_pop)</b>	0.0008	1.0000	0.9765	0.7818	1.0000	0.9999	0.0000
<b>Ordinary long-term credit</b>	0.4926	1.0000	0.8812	0.5241	0.0000	0.3632	0.0000
<b>Subsidized long-term credit</b>	0.0000	1.0000	0.9973	0.2175	0.1431	0.0000	0.0000

(a)The p-value presented is related to the Z-t-tilde-bar statistic.

(b)The p-value presented is related to the P statistic, which requires a finite number of panels, as is our case.

(c)Recall that in the Hadri LM test the system of hypotheses is inverted. See text.

**TABLE 23**  
**Unit Root Test Results on First Differences**  
*(p-values for seven alternative tests)*

Unit root tests	Levin-Lin-Chu	Harris-Tzavalis	Breitung	Im-Pesaran-Shin <sup>(a)</sup>	Fisher based on ADF <sup>(b)</sup>	Fisher based on Phillips-Perron <sup>(b)</sup>	Hadri LM <sup>(c)</sup>
<b>Activity rate (l_pop)</b>	0.0000	0.0000	0.0000	0.0000	0.4418	0.0000	0.0000
<b>Industrial labour share (lind_l)</b>	0.0000	0.0000	0.0000	0.0000	0.0031	0.0000	0.0040
<b>GDP per capita (gdp_pop)</b>	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.9954
<b>Ordinary long-term credit</b>	0.0000	1.0000	0.0054	0.0000	0.1102	0.0000	0.0000
<b>Subsidized long-term credit</b>	0.0023	0.0000	0.0213	0.0000	0.0011	0.0000	0.0000

(a)The p-value presented is related to the Z-t-tilde-bar statistic.

(b)The p-value presented is related to the P statistic, which requires a finite number of panels, as is our case.

(c)Recall that in the Hadri LM test the system of hypotheses is inverted. See text.

The four Westerlund cointegration tests reject the null hypothesis of no cointegration between long-term credit (in both of its components) and each of the three structural indicators. For brevity's sake in Table 24 we only display the no-constant/no-trend model results for the two types of long-term credit, as in Section 6.1.



**TABLE 24**  
**Cointegration Test Results**  
*(p-values for four alternative tests)*

**a) Ordinary Long-Term Credit**

<b>Westerlund test statistics</b>	<b>Gt</b>	<b>Ga</b>	<b>Pt</b>	<b>Pa</b>
<b>l_pop</b>	0.000	0.674	0.000	0.000
<b>lind_l</b>	0.002	0.893	0.002	0.166
<b>gdp_pop</b>	0.000	0.124	0.000	0.000

**b) Subsidised Long-Term Credit**

<b>Westerlund test statistics</b>	<b>Gt</b>	<b>Ga</b>	<b>Pt</b>	<b>Pa</b>
<b>l_pop</b>	0.051	0.967	0.000	0.078
<b>lind_l</b>	0.053	0.967	0.031	0.541
<b>gdp_pop</b>	0.005	0.639	0.000	0.000

Notes: Gt and Ga are group-mean tests; Pt and Pa are panel tests.

Having found evidence of cointegrating relationships between selected pairs of variables, we now estimate several error correction models based on regional data. We split Italy's twenty regions into three macro-areas (South, Centre and North) and once again consider the two components of long-term lending separately. We present results for the MG estimation in Tables 25 and 26 (selected according to the results of Hausman tests implemented on the three possible estimators), but resort to the FE model when the former leads to contradicting results relative to pooled and fixed effects specifications. Furthermore, we present results solely for the three macro-areas although all results hold also for the totality of Italy's regions. In the four decades under analysis across regions ordinary long-term credit responds negatively to regional activity rates and positively to industrial labour shares and to GDP per capita (except in the North where the latter cointegrating result is not significant). Long-run elasticities are in fact significant and large (rows 1). Adjustment speeds are correctly signed yet contained (rows 2). Subsidised credit reacts negatively to labour participation rates and positively to industrial labour shares and GDP per capita (except for the North in the former case and the South in the latter). In general, both categories of funds appear therefore to have been funnelled towards regions with higher unemployment rates and with sound or growing industrial structures and economies. Regional development and convergence therefore seems to have been a realistic aim of Italy's postwar credit policies: yet although ordinary and subsidised loans were directed to regions with lower employment rates, they also went where either

the potential for growth via industrialization was high or where positive feedback effects from a growing industrial sector/economy were large.

**TABLE 25**  
**Ordinary Long-Term Credit, Mean Group Estimation: Error Correction Form**

**South**

**Panel A – activity rate**

<b>diff_ln_ordlong-term credit</b>	<b>Coef.</b>	<b>Std. Err.</b>	<b>z</b>	<b>P&gt; z </b>	<b>[95% Conf. Interval]</b>	
<b>EC ln_l_pop</b>	<b>-4.240805</b>	1.957128	-2.17	<b>0.030</b>	-8.076706	-.4049044
<b>SR ec diff_ln_L_pop _cons</b>	<b>-.1168441</b> .786219 5.086732	.0165844 .5933775 2.305176	-7.05 1.32 2.21	<b>0.000</b> 0.185 0.027	-.1493489 -.3767794 .5686695	-.0843394 1.949218 9.604794

**Panel B – industrial labour share**

<b>diff_ln_ordlong-term credit</b>	<b>Coef.</b>	<b>Std. Err.</b>	<b>z</b>	<b>P&gt; z </b>	<b>[95% Conf. Interval]</b>	
<b>EC ln_lind_l</b>	<b>2.59013</b>	1.471749	1.76	<b>0.078</b>	-.2944446	5.474705
<b>SR ec diff_ln_lind_l _cons</b>	<b>-.1590961</b> -.220952 -3.319404	.0265194 .2920736 1.546422	-6.00 -0.76 -2.15	<b>0.000</b> 0.449 0.032	-.2110732 -.7934057 -6.350335	-.107119 .3515018 -2.884727

**Panel C – GDP per capita**

<b>diff_ln_ordlong-term credit</b>	<b>Coef.</b>	<b>Std. Err.</b>	<b>z</b>	<b>P&gt; z </b>	<b>[95% Conf. Interval]</b>	
<b>EC ln_gdp_pop</b>	<b>1.327038</b>	.1740811	7.62	<b>0.000</b>	.9858458	1.668231
<b>SR ec diff_ln_gdp_pop _cons</b>	<b>-.186562</b> -.1431938 -.8296282	.0239389 .3578702 .3309524	-7.79 -0.40 -2.51	<b>0.000</b> 0.689 0.012	-.2334814 -.8446065 -1.478283	-.1396426 .5582189 -1.1809734

## Centre

Panel A – activity rate

diff_ln_ordlong-term credit	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
EC ln_l_pop	<b>-8.886563</b>	3.073148	-2.89	<b>0.004</b>	-14.90982	-2.863303
SR ec diff_ln_L_pop	<b>-.1003084</b>	.0289988	-3.46	<b>0.001</b>	-.157145	-.0434718
	2.116699	1.708419	1.24	0.215	-1.231742	5.465139
_cons	4.79304	2.695096	1.78	0.075	-.489251	10.07533

Panel B – industrial labour share

diff_ln_ordlong-term credit	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
EC ln_lind_l	<b>5.142765</b>	1.783958	2.88	<b>0.004</b>	1.646271	8.639259
SR ec diff_ln_lind_l	<b>-.0872337</b>	.0266035	-3.28	<b>0.001</b>	-.1393756	-.0350919
	.4421083	.3239369	1.36	0.172	-.1927964	1.077013
_cons	-.5180973	.2517454	-2.06	0.040	-1.011509	-.0246855

Panel C – GDP per capita

diff_ln_ordlong-term credit	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
EC ln_gdp_pop	<b>1.630458</b>	.2133696	7.64	<b>0.000</b>	1.212262	2.048655
SR ec diff_ln_gdp_pop	-.2875305	.0514488	-5.59	0.000	-.3883684	-.1866926
	-1.013927	.1886603	-5.37	0.000	-1.383694	-.6441593
_cons	1.078445	.1434494	7.52	0.000	.7972894	1.359601

## North

Panel A – activity rate\*

diff_ln_ordlong-term credit	Coef.	Std. Err.	Z	P> z	[95% Conf. Interval]	
EC ln_l_pop	<b>-4.896126</b>	1.838869	-2.66	<b>0.008</b>	-8.500243	-1.29201
SR ec diff_ln_L_pop	<b>-.1437887</b>	.0200527	-7.17	<b>0.000</b>	-.1830912	-.1044861
	1.136485	.88338	1.29	0.198	-.5949081	2.867878
_cons	3.807927	1.191562	3.20	0.001	1.472509	6.143345

Panel B – industrial labour share

diff_ln_ordlong-term credit	Coef.	Std. Err.	Z	P> z	[95% Conf. Interval]	
EC ln_lind_l	<b>5.283669</b>	1.599569	3.30	<b>0.001</b>	2.148571	8.418768
SR ec	<b>-.150276</b>	.0396258	-3.79	<b>0.000</b>	-.2279412	-.0726109
diff_ln_lind_l	-.3420138	.3219706	-1.06	0.288	-.9730646	.2890369
_cons	-.6526253	.2904219	-2.25	0.025	-1.221842	-.0834088

Panel C – GDP per capita

diff_ln_ordlong-term credit	Coef.	Std. Err.	Z	P> z	[95% Conf. Interval]	
EC ln_gdp_pop	-.7967572	1.354889	-0.59	<b>0.556</b>	-3.452291	1.858777
SR ec	-.1536622	.0413478	-3.72	0.000	-.2347024	-.072622
diff_ln_gdp_pop	-.20331	.4758472	-0.43	0.669	-1.135953	.7293333
_cons	1.138184	.2188593	5.20	0.000	.7092273	1.56714

\* These results are obtained via a fixed-effects estimation.

**TABLE 26**  
**Subsidised Long-Term Credit, Mean Group Estimation: Error Correction Form**

**South**

Panel A – activity rate\*

diff_ln_subslong-term credit	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
EC ln_L_pop	<b>-15.1296</b>	2.303203	-6.57	<b>0.000</b>	-19.64379	-10.61541
SR ec	<b>-.1272099</b>	.0247526	-5.14	<b>0.000</b>	-.1757242	-.0786957
diff_ln_L_pop	-1.038895	1.008433	-1.03	0.303	-3.015388	.9375985
_cons	16.53519	4.295471	3.85	0.000	8.116224	24.95416

Panel B – industrial labour share

diff_ln_subslong-term credit	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
EC ln_lind_l	<b>8.923444</b>	.8506427	10.49	<b>0.000</b>	7.256215	10.59067
SR ec	<b>-.1401451</b>	.0162674	-8.62	<b>0.000</b>	-.1720285	-.1082617
diff_ln_lind_l	.1542099	.3438681	0.45	0.654	-.5197592	.828179
_cons	-8.728584	1.251127	-6.98	0.000	-11.18075	-6.276419

Panel C – GDP per capita

diff_ln_subslong-term credit	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
EC ln_gdp_pop	1.196281	4.219422	0.28	<b>0.777</b>	-7.073635	9.466196
SR ec	-.0495685	.0232441	-2.13	0.033	-.0951261	-.0040109
diff_ln_gdp_pop	1.705138	.4277961	3.99	0.000	.8666731	2.543603
_cons	.2291367	.7695851	0.30	0.766	-1.279223	1.737496

## Centre

Panel A – activity rate

diff_ln_subslong-term credit	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
EC ln_l_pop	<b>-32.77681</b>	13.39999	-2.45	<b>0.014</b>	-59.0403	-6.513316
SR ec	-.1050064	.0334391	-3.14	0.002	-.1705457	-.039467
diff_ln_L_pop	3.547384	1.571248	2.26	0.024	.4677938	6.626975
_cons	8.390367	2.061139	4.07	0.000	4.350609	12.43013

Panel B – industrial labour share

diff_ln_subslong-term credit	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
EC ln_lind_l	<b>6.56235</b>	.4893366	13.41	<b>0.000</b>	5.603268	7.521432
SR ec	<b>-.1102748</b>	.0241423	-4.57	<b>0.000</b>	-.1575929	-.0629567
diff_ln_lind_l	-.9851375	.2741848	-3.59	0.000	-1.52253	-.4477452
_cons	-1.916213	.6237164	-3.07	0.002	-3.138675	-.6937513

Panel C – GDP per capita

diff_ln_subslong-term credit	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
EC ln_gdp_pop	<b>2.100592</b>	.2740904	7.66	<b>0.000</b>	1.563385	2.637799
SR ec	<b>-.1966742</b>	.045112	-4.36	<b>0.000</b>	-.285092	-.1082564
diff_ln_gdp_pop	.8423425	.7918612	1.06	0.287	-.709677	2.394362
_cons	.2785786	.1217579	2.29	0.022	.0399375	.5172196

## North

Panel A – activity rate

diff_ln_ordlong-term credit	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
EC ln_l_pop	<b>-9.565348</b>	3.812614	-2.51	<b>0.012</b>	-17.03793	-2.092762
SR ec diff_ln_L_pop	<b>-.1468883</b>	.0383946	-3.83	<b>0.000</b>	-.2221403	-.0716363
	2.105582	1.871331	1.13	0.261	-1.562159	5.773323
_cons	6.382113	2.615362	2.44	0.015	1.256097	11.50813

Panel B – industrial labour share

diff_ln_ordlong-term credit	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
EC ln_lind_l	74.80459	73.40928	1.02	<b>0.308</b>	-69.07495	218.6841
SR ec diff_ln_lind_l	-.0750767	.0227816	-3.30	0.001	-.1197278	-.0304256
	-.0035861	.4942496	-0.01	0.994	-.9722975	.9651254
_cons	-.5566038	.7336028	-0.76	0.448	-1.994439	.8812313

Panel C – GDP per capita\*

diff_ln_subslong-term credit	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
EC ln_gdp_pop	1.346709	.5837208	2.31	<b>0.021</b>	.2026371	2.490781
SR ec diff_ln_gdp_pop	-.1168668	.0284097	-4.11	0.000	-.1725488	-.0611849
	-.0807593	.7397395	-0.11	0.913	-1.530622	1.369103
_cons	.4419203	.161504	2.74	0.006	.1253783	.7584623

\* These results are obtained via a fixed-effects estimation.

A last piece of evidence which may be of interest concerns the relationship between the two components of long-term credit. Whereas we saw in Section 6.1 that the two types reacted very differently to sectoral economic performance indicators, from a regional perspective their behaviour with respect to structural indicators is not significantly different. We therefore conducted Westerlund panel cointegration tests on the two long-term components (Table 27), certifying indeed the existence of a cointegrating relationship.

**TABLE 27**  
**Cointegration Test Results**  
*(p-values for four alternative tests)*

Subslong_ credit	Gt	Ga	Pt	Pa
Ordlong_credit	0.000	0.179	0.056	0.000

Notes: Gt and Ga are group-mean tests; Pt and Pa are panel tests.

Error correction models for the three macro-areas of interest, estimated with a MG procedure, point to a negative relationship between ordinary and subsidised long-term bank loans in the Centre and in the South, whereas in the North a long-run comovement of the two variables of interest is rejected (Tables 28-29). This result would seem to imply that in the central and southern regions of Italy substitution effects were at work, that is to say that subsidised credit was supplied in order to supplement scarce ordinary credit and/or that ordinary credit was crowded out by its subsidised counterpart. Conversely, in the North the behaviour of the two categories of long-term bank lending was unrelated.

**TABLE 28**  
**Subsidised vs. Ordinary Long-Term Credit, Mean Group Estimation:**  
**Error Correction Form**

**Panel A – South**

diff_ln_subslong- term credit	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
EC ln_ordlong-term credit	<b>-4.251141</b>	1.225105	-3.47	<b>0.001</b>	-6.652302	-1.849979
SR ec diff_ln_ordlong- term credit	-.0625537	.0076676	-8.16	0.000	-.0775818	-.0475255
	-.3002788	.0928284	-3.23	0.001	-.482219	-.1183385
_cons	.4884661	.0593873	8.23	0.000	.3720691	.604863

**Panel B – Centre**

diff_ln_subslong- term credit	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
EC ln_ordlong-term credit	<b>-14.11685</b>	6.109102	-2.31	<b>0.021</b>	-26.09047	-2.143232
SR ec diff_ln_ordlong- term credit	<b>-.0573774</b>	.0161052	-3.56	<b>0.000</b>	-.0889429	-.0258118
	-.527167	.0453256	-11.63	0.000	-.6160035	-.4383304
_cons	.4926419	.1225797	4.02	0.000	.2523901	.7328937

Panel C – North

diff_ln_subslong-term credit	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
EC ln_ordlong-term credit	-7.242773	17.14611	-0.42	<b>0.673</b>	-40.84853	26.36298
SR ec diff_ln_ordlong-term credit	-.0460198	.0144133	-3.19	0.001	-.0742693	-.0177703
_cons	.1416378	.2033497	0.70	0.486	-.2569203	.5401959
	.3244232	.0977393	3.32	0.001	.1328577	.5159886

TABLE 29

Ordinary vs. Subsidised Long-Term Credit, Mean Group Estimation: Error Correction Form

Panel A – South

diff_ln_ordlong-term credit	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
EC ln_subslong-term credit	<b>-1.45716</b>	.5121989	-2.84	<b>0.004</b>	-2.461051	-.4532683
SR ec diff_ln_subslong-term credit	<b>-.0987057</b>	.0147297	-6.70	<b>0.000</b>	-.1275753	-.0698361
_cons	-.1245629	.0402816	-3.09	0.002	-.2035134	-.0456125
	.723213	.1014365	7.13	0.000	.524401	.922025

Panel B – Centre

diff_ln_ordlong-term credit	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
EC ln_subslong-term credit	<b>-3.366456</b>	.392003	-8.59	<b>0.000</b>	-4.134768	-2.598144
SR ec diff_ln_subslong-term credit	<b>-.0850974</b>	.0277194	-3.07	<b>0.002</b>	-.0307683	-.1394265
_cons	-.2577846	.059358	-4.34	0.000	-.3741242	-.141445
	.6800732	.1747162	3.89	0.000	.3376357	1.022511



Panel C – North

diff_ln_ordlong-term credit	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
EC ln_subslong-term credit	3.09692	2.596404	1.19	<b>0.233</b>	-1.991938	8.185779

towards the most fast-growing or performing sectors (“premium” policy) nor was it directed systematically to the worst (“helping hand” policy). In other words, the unifying rationale of credit policy was not sector-based. Our evidence points to the special credit institutions as being relevant actors in Italy’s sectoral economic development in the period 1951-88, although via their ordinary credit channels.

Conversely, regional development and convergence appears to be a significant rationale for Italy’s postwar credit policies. Our empirical results point to both components of long-term credit reacting negatively to activity rates and positively to industrialization/growth processes in the four decades under study. Therefore, whereas it is true that long-term bank loans, some of which supplied at advantageous rates, were directed to those areas where unemployment was high (i.e. needy areas), they were also supplied to areas where growth potential via industrialization was strong or feedback effects on growth were large (i.e. the most responsive and performing areas). It is noteworthy that in the regional setup both types of long-term bank lending responded to the same criteria. A further panel cointegration analysis points to a negative long-run relationship between subsidised and ordinary bank loans in the Centre-South of Italy, thereby suggesting a direction of subsidised flows to areas with scarce ordinary loans and/or a crowding-out effect of subsidised credit on ordinary lending, whereas in the North the behaviour of the two components is not significantly related.

Finally, a natural extension of this paper should be the measurement of the *effects* of the described credit policies on Italy’s post-WWII economic development. However, in order to accurately quantify the impact of such policies, more structure must be given to the models used in this paper, in order to reduce the bias deriving from omitted variables. This would imply further expanding the dataset with new variables for which the availability of both a sectoral and regional disaggregation over the 1951-1988 period is required. Furthermore, one must correctly tackle endogeneity issues arising from reverse causality between the variables considered. Alternative dynamic panel estimation techniques, such as the General Methods of Moments which has extensively been used in studies investigating the causal links between finance and growth (see for instance Levine, Loyaza and Beck 2000; Monnet 2012, De Bonis, Piazza and Tedeschi 2012), could be employed, yet again only once our dataset has been successfully enriched.

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