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**Financing a Planned Economy: Institutions and Credit Allocation
in the French Golden Age of Growth (1954-1974)**

Eric Monnet

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Berkeley Economic History Laboratory (BEHL)
University of California, Berkeley
530 Evans Hall / MC 3880
Berkeley, CA 94602
<http://behl.berkeley.edu>

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Keywords: French planning, Banque de France, credit policy, catch-up growth, financial repression, coordinated capitalism

JEL classification: E44, E58, G18, G28, N14, O16, O21, P11

Eric Monnet Paris School of Economics monnet@pse.ens.fr

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The role of banking and finance in the Golden Age of European growth (1950-1973) is very little known and widely underestimated. This paper studies the French system of economic planning and investment-based strategy that enhanced medium and long-term financing (called “investment credit” at that time). First, I describe the new institutions that were built after WWII to organize credit allocation. I especially highlight the role of the central bank through the National Credit Council. I then use a newly constructed database that matches the amount of credit (that had to be registered at the Banque of France) in 49 sectors to corporate tax sectoral statistics. It shows a significant positive relationship between “investment credit” and the marginal product of capital. The allocation of medium/long term credit managed to favor the allocation of productive capital across sectors and thus to ensure the catch-up process. Using GMM estimations in order to avoid the endogeneity bias, I find that the effect of “investment credit” on growth is significant and positive, contrary to short-term credit which did not play any role for investment. Understanding the institutional framework that shaped the mechanisms and success of credit policy in the French mixed economy during the 50s and 60s also helps to understand its failures during the mid 70s.

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There is a financial paradox about the Golden Age of European Growth (1945-1973). How could the era of the highest sustained economic growth ever in “the old continent” be associated with financial repression? The common explanations of postwar growth (catch-up, technological progress, factor reallocation, rise of the consumer society) do not solve the puzzle. Investments that supported the reallocation of capital and technological improvements necessarily had to be financed and some financial institutions must have been there to channel the funds.

While the importance of financial development for growth has been extensively studied and documented by many historians and economists (Rajan and Zingales 1998, Levine, Loyza and Beck 2000, Rousseau and Sylla 2003, Rousseau and Bordo 2011), it is noteworthy that the recent literature in economic history about post-war European economic growth (Crafts and Toniolo 1996, Temin 2002, Eichengreen 2006, Vonyo 2008, Eichengreen and Ritschl 2009) has largely ignored the financial factors and institutions that promoted this tremendous growth. In their classic study of French postwar growth, Carré, Dubois and Malinvaud (1972) paid no attention to finance and the banking system. There is no obvious explanation for the financing of the huge postwar increase in investment since the size of financial markets remained small until the 1980s, capital controls were imposed and the reconstructing economies faced credit constraints and low savings due to informational problems and destruction of collateral during the war.

The discrepancy between the high growth of credit and output and the many distortions in financial markets have led many economists to conclude that the Golden Age of European growth occurred *despite* the numerous financial restraints. Looking at stock market data, Voth (2003) argues that financial repression - especially capital controls - have hampered growth in postwar Europe. Saint-Paul (1993) focuses on the reconstruction period (1945-1958) and points out that France could have engaged in more foreign borrowing. Reviewing the French experience, Sicsic and Wyplosz (1996) suggest that the high growth rates of the 1960s and early 1970s might have even been higher absent widespread public intervention. Wyplosz (1999) also observes that the correlation between high growth and financial restraints in postwar Europe is a robust fact and he finally concludes that “This is an indication that, for a host of reasons, the much trumpeted distortions of [financial restraints] are less serious than (simple) theory predicts. After all France and Italy were considered as stunning postwar successes, as were Korea and Japan, while they were actively stifling financial freewheeling” (p.31).

None of these papers is based on a detailed study of the banking system and the allocation of credit. They discuss the effects of financial restraints but do not study the financial institutions and mechanisms that - as imperfect as they were - have been associated with growth. They assume that the fast development of credit and real balances has been pulled by growth rather than the contrary.

On the other hand, political scientists working on the French economy (Zysman 1983, Hall 1986, Hayward 1986, Loriaux 1991) have highlighted the strong relationships between industrial policy and credit policy. They argued that these links benefited growth and agreed that “the French state’s characteristic ability to promote investment through control over the supply of credit enabled the French to achieve rapid industrial development and industrialization in the 1950s and 1960s” (Loriaux, 1991, p.4).² Historians who have studied some specific industries and banks over this period also underline the role of the state in credit development (Bonoldi and Leonardi 2009, Conti and Feiertag 2009). But these two types of studies offer no quantitative evidence on the effects of interventionist credit policies. They take for granted that credit is good for growth without investigating further how credit was allocated and what role the state played in this allocation. There have been some fascinations as well as criticisms of French indicative planning (Baum 1958, Hackett and Hackett 1963, Bauchet 1964, Boff 1968, Adams 1986), but its financial side remains largely unexplored.

The paradox of financial restraints and high growth is especially striking in France, a country that featured all the characteristics of financial repression,³ had the lower rate of self-financing among western European nations over the period (Hautcoeur 1999b) and whose stock market capitalization (over GDP) declined constantly from 1961 to 1975.⁴

²Loriaux adds that “But as the international economic constraints of the 1970s overloaded the state with contradictory demands, interventionism met with fewer and fewer successes.”

³The banking system was forced to hold government bonds to allow the government to finance budget deficits at a low cost ; the development of equity markets was small and discouraged; the banking system faced interest rate ceilings to prevent competition with public sector fund raising; the regulations included interest rate ceilings, compulsory credit allocation and ceilings, and high reserve requirements, which were also instruments of monetary policy; the government owned or controlled the main domestic banks and financial institutions, and the transfer of assets abroad were restricted through the imposition of capital control (Wilson 1957, Loriaux 1991). Needless to say, these features were common in Western Europe, Japan and East Asia at that time and they are still characterizing many developing countries today.

⁴Quoting an OECD study, Marnata (1973, p.76) shows that stocks and bonds issues in France equal 9.3% of GDP in 1968 whereas they equal 18.7% in Germany and 25.4% in the US. According to O’Sullivan

Did the French bank-based system, highly controlled by the state, manage to allocate funds in a way that fostered investment and production growth?

The contribution of this paper is to review the tools of state intervention in the banking and financial sector and to offer a comprehensive study of credit allocation in postwar France. In order to investigate the role of the state, it is very insufficient to consider only directed credit from the government to some industries. The role of banks (not only nationalized banks) as well as the public and semi-public credit institutions must be explained and taken into account. In a *dirigiste* or planned economy, public intervention is ubiquitous even if the decision to lend is ultimately taken by private bankers. The state imposes controls on interest rates, provides incentives for banks and attempts to reduce informational constraints. The central bank especially plays a crucial role in credit allocation through banking supervision, rediscounting and various types of credit control. Three main questions will be at the core of the analysis: how the recommendations from the government and the central bank in order to allocate credit to priority firms and sectors were enforced? was the allocation of credit efficient? and how financial development evolved over time and affected growth?

To address these questions I use both archival material from the National Credit Council (*Conseil National du Cr dit*, hereafter: CNC) and a newly constructed database that matches the sectoral characteristics from corporate tax data published by the Ministry of Finance with sectoral outstanding loans registered at the Banque de France by the *Service central des risques* and the CNC. It is the first work that matches these two sources in a comprehensive way. These sectoral data had not been used previously because they came from two different administrations and because of the changes in national accounting, credit data and official definitions of sectors in 1975. The database includes 49 sectors and distinguishes between short-term credit on one hand and medium and long-term credit on the other hand, then allowing a detailed quantitative account of the sectoral allocation of credit from 1954 to 1974.

To my best knowledge, the only previous attempt to provide an account of the role of finance at a sectoral level during the French Golden Age (*Trente Glorieuses*) was a study by INSEE (1974) - i.e. the French National Institute for Statistics and Economics. This

(2007, p.10), total market capitalization in 1975 equals 27% of GDP in France, 43% in Germany, 70% in Japan, 84% in the UK and 101% in the USA.

study was a very ambitious project aiming to offer a complete picture of the evolution of productivity, profit and technological progress since 1945 but it devoted little attention to the allocation of funds. INSEE separated the French economy in only 10 branches and looked at the financing of only 450 private firms quoted on the stock market (SEDES file) between 1966 and 1972. The study concluded that these 450 firms increased their external funding over this short period and that leverage increased financial profitability. Although these results suggest a well functioning system, they cannot be considered as representative and the authors of the INSEE study did not underline any conclusion for growth.

In the remaining of the paper, I first portray the French banking system and its new institutional features after WWII. New regulatory institutions and the CNC were created to ensure that “credit allocation served national priorities” and that French firms received enough credit to invest and increase their productivity and growth. Public and semi-public specialized credit institutions and the Banque de France played a great role in giving priority sectors an access to medium and long-term financing instead of to commercial bills only.⁵ Medium and long-term credit were called and registered at the CNC under the name “investment credit”(*crédits d'investissement*). The new institutions were designed to favor financial development when the economy faced prevalent credit constraints that were not likely to be relaxed without public intervention. Saving was low after the war and the state did not believe in the capacity of the free market to transform deposits into long-term loans. French politicians thought that banks needed incentives as well as better information in order to finance investment and that, eventually, “loans would make deposits” and would thus attract savings. I interpret this new system with a strong intervention of the state as an institutional design that solved a coordination problem (Rodrik 1994) and had the properties of second-best institutions (Rodrik 2008). It enabled the French economy to finance long-term investment which was crucial to approach the technology frontier (Acemoglu, Aghion, Zilibotti 2006).

Such a *dirigiste* economy with an investment-based strategy was thus characterized by selective and directed credit as well as by many information and recommendations issued by the Planning office (*Commissariat Général du Plan*) or the CNC in order to guide banks’ behaviors. The guidelines for credit allocation operated at a sectoral level

⁵Medium-term credit was defined as between 2 and 5 years. Long-term was more than 5 years.

and were reinforced by the segregation and specialization of the banking system. The sectoral specialization of many banks (agriculture, hotel business, energy, SMEs, ship-building, housing etc.) helped the state to influence the allocation of credit across sectors. Furthermore, monetary policy also reinforced credit selectivity across sectors through discount ceilings and selective limits on credit expansion.

The complex interactions between banks, specialized credit institutions, the Planning office and the Banque de France policy make impossible to identify and distinguish precisely the share of credit that was allocated through a pure market process from the share that was allocated through public intervention (Wilson 1957, Aymard 1960). Neither the Planning office nor the CNC assigned formal quotas of credit by sectors. Both relied mainly on “indicative” recommendations. But the CNC could influence the rediscounting policy of the Banque de France and use its very detailed banking statistics as well as the reports from the central bank’s branches to operate at a much more microeconomic and informal level than the Plan.

Our approach thus does not (and could not) attempt to distinguish exactly between public credit and private credit. The only reasonable claim is that state intervention focused mainly on the provision of medium and long-term credit. Instead I use the sectoral database to highlight the main characteristics and effects of the overall credit allocation. The intervention of the state was concerned by this overall allocation (the “national interest”), and thus must be evaluated at this level. The choice not to intervene is as important as the choice to intervene.⁶

I thus focus on the distinction between short-term and medium-long-term credit. This distinction is not only important because it was recognized as a crucial issue at that time by policymakers, but also because the comparative performance of both types of credit on investment is still an open question in the economic literature (Diamond 1991, Hart and Moore 1994) .

The corporate tax statistics allow us to calculate the marginal returns of capital (MPK) for each sector over the period 1954-1974. I find a positive correlation between the MPK and medium and long-term credit by sector for every year of the sample, which shows that the *crédit d’investissement* indeed flowed to the sectors with the higher marginal return, in agreement with the predictions of neoclassical theory. This relation does not hold for

⁶Calomiris and Himmelberg (1995) provide a very good explanation of the problem of focusing on directed credit only when one wants to evaluate the overall action of the state.

short-term credit whose role was mainly to support temporary commercial transactions rather than to favor investment. An important result is that this positive correlation is still significant - though smaller - for a sample of the smallest (less credit intensive) sectors. This simple analysis thus highlights that investment was funded in a way that could benefit a good allocation of the factors of production. The correlation between “investment credit” and the number of employees is not significant, thus ruling out the argument that the allocation of credit was primarily determined by the willingness to support directly employment for political economy reasons. Furthermore, the correlations do not show any change in credit allocation at the beginning of the 1970s. So, rents in some industries and credit misallocations seem to be a phenomenon that did not arise before the mid 1970s. But despite the positive correlation, the convergence of sectoral MPKs is slow over the period (as already shown by Bénard 1974 with a different dataset), which may reveal some inefficiencies.

Comparisons with other countries would be necessary to construct a counterfactual exercise and especially to discuss whether the correlation between MPK and credit could have been higher. But the quantitative evidence do show that the *crédit d'investissement* was allocated in a way that is consistent with growth theory.

In order to investigate further the characteristics and the effects of credit allocation, I use the within estimator in a dynamic panel framework to estimate the determinants of the amount of credit within each sector over the period. Short-term and medium-long-term credit both increase with the turnover of the sector, but only “investment credit” increases when the sector becomes more capital intensive. I also estimate the impact of monetary policy on credit using the index of credit control (monetary restrictions) I constructed in Monnet (2011b) based on archival material. Credit controls affect both types of credit in a similar way but this effect differs strongly across sectors. Indeed, monetary policy had no significant impact on credit in the 12 more credit intensive sectors which were also some of the most protected by the instructions of the Planning office and the CNC (metallurgy, siderurgy, oil, transports, electricity etc.). It confirms quantitatively that credit controls were used by the Banque de France as a device to credit selectivity. Finally, I estimate the effect of credit on the real growth rate of investment and turnover with panel data using the GMM estimator. This method is designed to avoid the endogeneity bias. I find that medium and long term credit had a significant positive impact

on growth. This result shows how decisive was the *crédit d'investissement* for the path of the French economy. This type of credit had first been mainly granted by the Treasury, semi-public credit institutions and the Banque de France (through rediscounting) before commercial banks also started to lend at a longer term by the end of the 1950s. The observed evolution of credit is also consistent with narrative evidence that shows that the government and the Banque de France restricted credit to agriculture and to small businesses in the 1950s in order to push the reallocation of labor towards industrial sectors.

Schumpeter might have been right about the importance of finance for economic development. This relation was also at the core of the French *dirigiste* economy.

1 The “nationalization of credit”

After WWII, French politicians had two political and economic priorities: the need for investment and the “nationalization of credit” (Andrieu 1984, Loriaux 1991, Margairaz 1991, Feiertag 2006b). The first one was essential to reconstruct the economy and then became a constant claim of the 1950s and 1960s to favor a new birth of industry. The second one was a political consideration that built on a large consensus among policy-makers from the left to the right, and was especially supported by the center right, the dominant political force of the IVth Republic. The “nationalization of credit” was not a synonym of the nationalization of the banking system even though the four major commercial banks as well as the central bank were nationalized in December 1945. This expression meant that the state had to organize a network of public, private institutions and supervisory agencies that would guarantee that credit finance the national economic and social priorities (Kuisel 1984). It was an essential feature of “France’s New Deal” (Nord 2010).

A consensus was built about the quest for growth and the compelling sense of French economic backwardness. In the words of Richard Kuisel: “By 1945, French public authorities had developed a keen sense of economic retardation and accepted the need for expanding and making more use of the nation’s economic potential” (1984, p.277). These views were shared both by liberal and technocrats reformers from the right and the center right and by socialists-syndicalists who had already developed the idea of “nationalization of credit” during the 1930s (cf. Monnet 2011a). They shared the idea that the private sector, and especially the banks have failed to provide the French economy with the level

of productivity and financial development that it deserved. The influential economist Alfred Sauvy was a prominent figure to denounce French economic and demographic malthusianism that had prevailed in the interwar period (Sauvy, 1946, pp.242-251).

This climate of change also gave birth to indicative planning. The institution that supported industrial indicative planning was the Planning Office and the Ministry of Finance (including the Treasury). The main institution that supported the “nationalization of credit” was the Banque de France, and especially two new supervisory agencies within the Banque: the *Conseil national du crédit* (CNC, National Credit Council) and the *Commission de controle des banques* (CCB, Commission of Banking control) created by the law of 2 December 1945. The latter was in charge of banking supervision while the first one was in charge of the allocation of credit, that is to set and monitor the rules about banking credit and to decide on the main credit policy orientations. The CNC also developed an important service of statistics (*Service central des risques*) that collected monthly statistics on the banking sector.

The French financial system was dominated by four main types of institutions that can be distinguished according to the nature of their resources.

First, the Treasury (*Trésor*) - the “banker of the state” (Quennouëlle-Corre 2000) - which depends on the Ministry of Finance. It had three kinds of resources: taxes, Treasury bonds, and deposits (mainly postal cheque-account deposits).⁷ The Treasury could also obtain directly some funds from the *Caisse des dépôts et consignations*.

Second, commercial banks financed credit from their deposits. Since the banking laws of 1941 and 1945, they were separated from investment banks that could only accept time deposits (more than 2 years).

Third, the *Caisse des dépôts et consignations* (CDC), received around 80% of its resources from saving banks (*caisses d'épargne*) and 20% from pensions funds and the social security. The CDC could grant long-term loans to firms and municipalities and refinance banks with medium-term rediscounting.

Fourth, the *Crédit National* and *Crédit Foncier* were both semi-public institutions that could not received deposits but issued bonds and stocks. Hence their loans were not money creation. But these institutions could ask the Banque de France to rediscount their loans.

⁷ *Comptes de chèques postaux*

The graphs in the *Appendix 2* show the repartition of loans from these various institutions. Following the conventional practice of CNC statistics, the CDC loans appeared in the category “specialized credit institutions” (*organismes spécialisés*) together with *Crédit Foncier*, *Crédit National*, *Crédit Agricole* and *Banques populaires*. The distinctive feature of the postwar French banking system is that the Treasury and the Banque de France (through rediscounting) were the most important lenders in the 1950s and were replaced by banks and specialized credit institutions in the 1960s. Monnet(2011a) has also explained why such an evolution did not necessarily reduce the ability of the state to intervene in credit allocation through other means such as recommendations and exemptions from controls.

Such a powerful and large system of banks and specialized credit institutions did not let a lot of room to the financial market. The French stock and bond market reconstructed quite quickly during the 1950s (Figures 1 & 2), notably thanks to the issue of bonds by nationalized firms and specialized credit institutions (Figure 3). But at the beginning of the 1960s, once the reconstruction of banks’ capacities has been achieved, the total market capitalization reached an upper bound. Its role kept decreasing during 15 years while the French economy was experiencing high growth and credit development. As a consequence, the financial market never provided more than 10% of the total financing of investment over the period (Marnata 1973, Quennouëlle-Corre 2005) and it financed mostly nationalized firms and public investments.

Stock market indices and returns

France, 1945-1974

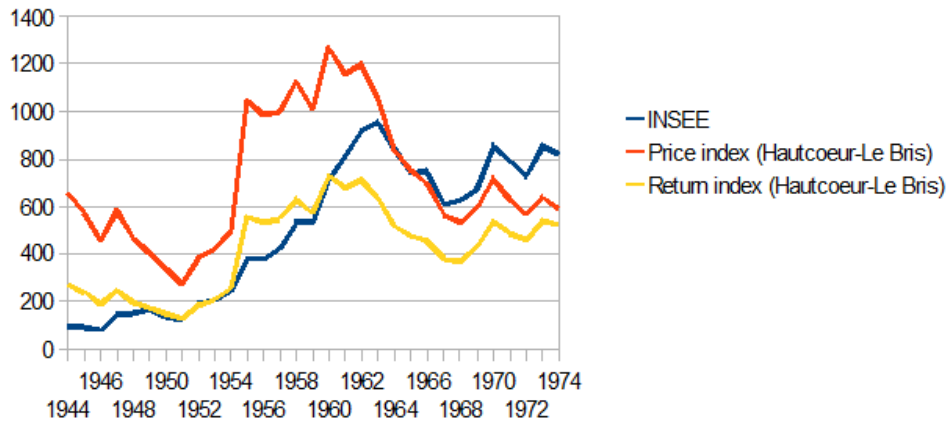


Figure 1:

Sources: Hautcoeur-Le Bris (2010) and Global Financial Data. The INSEE index includes 300 shares. Hautcoeur and Le Bris construct a weighted index of 40 shares comparable to the current CAC40.

Stock market capitalization to GDP

France 1945-1974

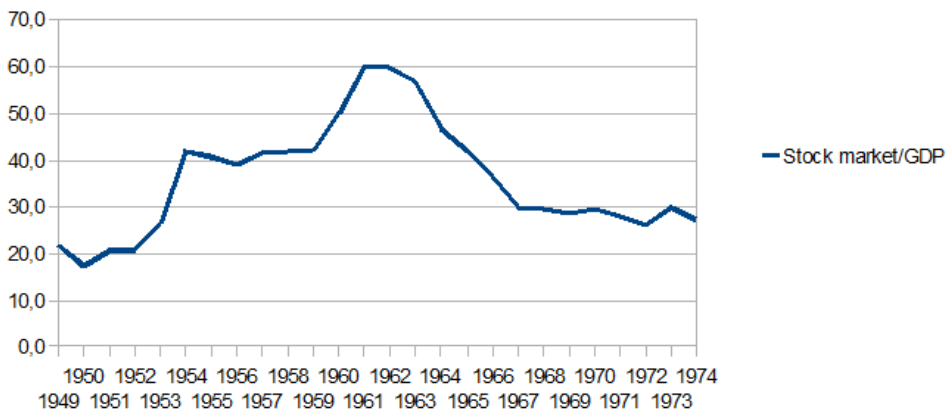


Figure 2: Sources: INSEE, Global Financial Data.

Issues of bonds and stocks.

Share of each issuer. France, 1946 -1970.

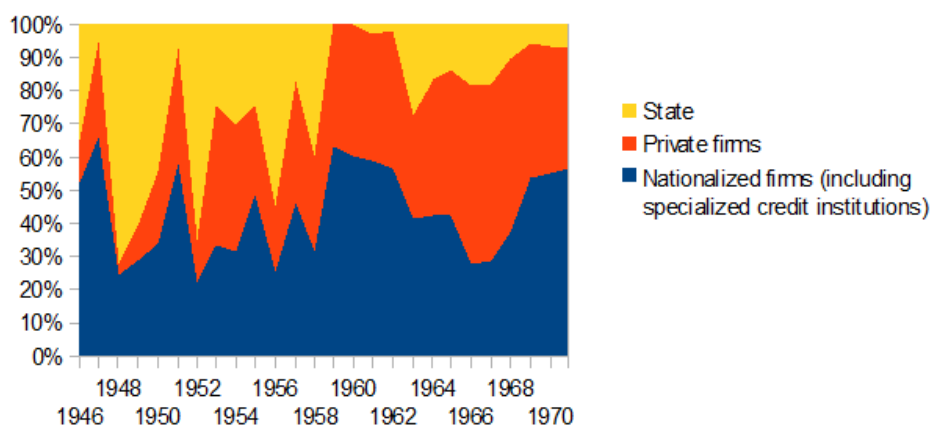


Figure 3: Source: Marnata (1973, p.60)

2 Priority to medium and long-term credit: the *crédit d'investissement*.

Among the distinctive properties of the new system, there was a strong focus on the development of medium and long-term financing of firms. Before WWII French banks usually did not lend at a long maturity; the commercial bill (*escompte*) was still the predominant form of banking activity (Bouvier 1973, Plessis 1991). The biggest firms raised funds at a longer term on the stock market with the help of banks (Hautcoeur 1999a). The predominance of short-term credit was considered as the main weakness of the French financial system and much effort was devoted to solve this failure after the war.⁸ Institutions were created or reformed in order to finance the French economy at a longer term. The public long-term loans from the Treasury were increased. More power and new attributions were given to the specialized credit institutions (*Credit National, Crédit Foncier, Caisse des dépôts, Banque française du commerce extérieure*) whose role

⁸Such criticisms were not new. In 1906, the journalist Lysis wrote a pamphlet against the monopoly of the big banks that he accused to ration credit. It originated a long controversy (Plessis 1991). Feiertag (2006b) highlights the role of Wilfried Baumgartner, director of the Credit National (1936-1949), then Governor of the Banque de France and finally Minister of Finance (1960-1962), in the way credit policy had been implemented.

had always been to provide long-term financing. The specialized credit institutions either lent directly to firms or bought Treasury bills and then financed indirectly Treasury loans ; this network was called the “Treasury circuit” (*Circuit du Trésor* cf. Margairaz 1991, Quenouelle-Corre 2005). But there were also important reforms on the monetary side: the Banque de France started to rediscount medium-term bills. This new policy, which was potentially very inflationary, was much more than only symbolic. It completely changed the activities of French banks since they were allowed to lend between 2 years and 5 years and obtain refinancing from the central bank.

Medium (2 to 5 years) and long-term credit (more than 5 years) were registered in the CNC statistics as *Credit d'investissement* (“investment credit”).

One fundamental characteristic of the French economy after WWII is that the usual tools of financial repression were associated with an active credit policy in order to increase financial development and investment. Financial repression was not an isolated policy deemed to increase seigniorage but a set of protectionist rules aimed to favor domestic financial development and especially long-term financing (Loriaux 1991).

2.1 The maturity of loans in theory

Surprisingly enough, the distinction between short and medium/long-term credit is not so well documented in the economic literature. Justifications of state interventions to extend the term of loans are thus not straightforward, even as a second best policy. From a theoretical point of view, following the Modigliani-Miller theorem, there is no difference for a firm between financing at a short maturity (and rollover the loan or ask for a new one), and financing at a long maturity. A influential model that includes idiosyncratic risks (Meyers 1977) shows that it is better for the firm to get shorter loans because long-term loans can cause a debt overhang and underinvestment. A recent paper by Diamond and He (2011) challenged this idea and shows that short-term debt can also create a debt overhang with a high risk of default since there is less uncertainty resolved over the shorter time until it matures and an increase in investment will thus not result in any payoff to equity. It explains why short-term debt is often involved in recessions.

Hart and Moore (1994) take a different view and state that the difference between short-term financing and long-term financing arises because of the threat of a renegotiation or liquidation. If the creditor cannot credibly commit not to repudiate (i.e. to refuse to

grant new loans) again in the future, then the debtor may liquidate even though gross returns exceed liquidation value. Short-term debt may give too much control to the creditor and lead to premature liquidation. Long-term debt then works as a protection for the debtor. Without this protection, firms may hesitate to invest in equipments that bring a long-term return. According to Hart and Moore it explains why “long-term loans are usually used for fixed-asset acquisition, of property, leasehold improvements, machinery and the like. Short-term loans, on the other hand, tend to be used for working capital purposes - e.g for payroll needs, for financing inventory, for smoothing seasonal imbalances.”(1994, p.864) From a planner point of view that wants to maximize investment in the economy, medium and long-term credit is better when there is a sufficient risk such that a firm with only short-term bills would never invest in long-term equipment. This simple consideration justifies why the assumption is usually made in growth models that long-term investment contributes more to productivity growth (Acemoglu et al. 2006, Acemoglu et al. 2010), and why an investment-based strategy needs long-term subsidies to industry (Acemoglu and Zilibotti 1997, Acemoglu et al. 2006).⁹

The French financial system was thus organized to solve an agency problem. The Treasury and specialized credit institutions granted long-term loans and the Banque de France rediscounted medium-term loans such that firms could not fear a liquidation. These guarantees of course had their drawbacks: firms’ default could have led to a fiscal crisis or to a monetary crisis. The credibility of both the government and the central bank, as well as the conviction that growth was ongoing and sustained, were thus fundamental pillars of the system.

Banks’ short-term views and attitudes in the interwar period were accused to have prevented long-term investments. The *crédit d’investissement* was supposed not only to increase investment but also to foster the specialization of industries. Technology specialization is normally a consequence of well functioning financial markets: finance contributes to growth by facilitating a greater division of labor (Saint-Paul 1992) and the selection of productive capital (Acemoglu and Zilibotti 1997). The French postwar financial institutions were reformed in order to accomplish this specialization rather than to let it entirely to free market forces. The banking system was thus very segregated with many banks specialized in a specific sector (Wilson 1957); the state intervention targeted

⁹De Long and Summers (1991) find that equipment investment causes growth in a large sample of countries from 1945 to 1985.

some priority sectors and favored the reallocation of factors (cf. *infra*, section 3).

But the supply of medium or long-term credit to some sectors by the state is a second best policy (Hart and Moore 1994, Dewatripont and Maskin 1995) and - as long as the planner has imperfect information - it may offer a protection to firms that would not have received loans in an equilibrium with perfect information and thus create a debt overhang in poorly performing sectors. The possibility of such a debt overhang and rents is usually the main argument against state intervention in the credit market.

An interesting mechanism highlighted by Diamond (1991) and Flannery (1994) is that if good firms observe that bad firms receive long-term credit (because creditors cannot distinguish between firms), the good firms - which are less likely to suffer from repudiation - will demand short-term loans in order to signal themselves. Asymmetric information leads some firms to choose short maturity because they are less likely than other firms to have problems rolling over their short-term debt either in terms of high interest rates (Flannery) or liquidity risk (Diamond).

As a consequence, we only know for sure that in a first best world, there is no difference between financing at short or long maturity. But in a second best world, it is not possible to state clearly whether long-term loans are associated with productive investment and growth or whether they are associated with rents and debt overhang. Poorly performed or bad state intervention in the banking sector aimed at extending the maturity of loans would thus result in pushing good firms to raise funds either on the stock market or through short-term loans (as a signaling device). It would also increase the amount of unproductive loans that do not lead to investment and production growth.¹⁰

There is room for empirical evidence here and there are rival hypotheses to test. In section 4, I will thus attempt to investigate whether the priority given to the *crédit d'investissement* caused growth or, on the contrary, created misallocations and led productive firms to prefer short-term financing.

¹⁰State intervention in the allocation of credit can create rents and channel credit to inefficient firms and sectors because of bad information, path dependency or political pressures (capture of the bureaucrats or rent-seeking). In France in the late 1970s and early 1980s, these rents were widely recognized (Dutailly 1981) by policymakers and entrepreneurs likewise and they may have been a cause of the stagflation of the 1970s and 1980s as famously explained by Olson (1982). Bertrand, Schoar and Thesmar (2005) have shown that the French banking liberalization of the early 1980s eliminated many inefficient firms from the economy.

2.2 When the state intervenes

Why can state intervention in the allocation of credit work?

In a paper about postwar growth in Taiwan and South Korea, Dani Rodrik (1994) highlighted the role of investment-based policies that worked either through direct subsidies or through the coordination of information in the banking sector. The institutions and policies in these two countries were quite similar to those in postwar France. Rodrik interprets these institutions as solving a coordination failure: while the rate of return to coordinated investments was high, the rate of return to individual investments remained low (p.78). Interestingly enough, the conditions described by Rodrik for government intervention to work are very relevant in the French context: first the country must be ready for economic take-off (that is there must be other “good” institutions, sufficient human capital etc.) and second, the government must be able to undertake the measures needed to override the coordination failure. The first condition was met because, despite the war, the French economy had inherited “good” institutions (education, property rights, fiscal centralization, parliaments etc.).¹¹ For the second condition to hold, government intervention should not be captured by rent-seeking private interests. As I have discussed in Monnet (2011a) following previous works by Olson (1982), Kuisel (1984), Margairaz (1991) or Nord (2010), the end of the war had decreased the influence of many vested interests. This was a crucial condition for the functioning of the “nationalization of credit”.¹²

Other studies on East Asia, without offering a quantitative analysis at the sectoral level, have also highlighted the conditions for state intervention in the credit market to pro-

¹¹The literature on what are good institutions for growth is large but not always conclusive and robust besides the obvious claim that “institutions matter”. For critical and nuanced reviews see Aron (2000) and Engerman, Sokoloff (2000). It is sufficient here to say that France has achieved a high level of economic and human capital development compared to the rest of the world in the mid XXth century and that its republican tradition and its long lasting civil code facilitated the transition from the Vichy regime to a new republic and reduced the risk of rent extraction by a political elite. But France was also threatened by political instability and the path of the French economy could have been different, as suggested by the violent strikes of 1947 (Valentin 1985) and the political divisions over the Algerian war (Rioux 1990).

¹²The composition of the National credit council was in itself very symbolic since it was conceived as a little parliament within the Banque de France with some representatives of the main sectors, activities and ministries (agriculture, industry, finance, foreign trade), of the private and public banks as well as of the semi-public credit institutions.

mote growth rather than rents and debt overhang (Wade 1992, Vittas and Cho 1995, Calomiris and Himmelberg 1995, Arestis and Demetriades 1997, Demetriades and Luin-tel 1996, 2001). They point out five prerequisites and characteristics of the East Asian successes: credit policy should aim at achieving positive externalities rather than helping without conditions declining industries, firms must enjoy managerial independence without interventions of the creditors, the state must ensure that loans are repaid, communication between public intervention and the private sectors (both banks and firms) is essential and notably the collection and dissemination of information on markets, and finally, real interest rates should be positive (which necessitates a stable inflation rate). These prerequisites - that might be necessary be not sufficient -¹³ indeed highlight the differences between a planned economy - where public and private sector are closely intertwined - and a command economy where state intervention is never intended to promote private investment. The next section will show that postwar indicative planning in France shared these characteristics with the East Asian economies as a substantial political science literature has already underlined (Ruggie 1982, Zysman 1984, Hall 1986, Wade 1992).

3 Instruments and criteria of credit selectivity

3.1 The instruments of intervention

The intervention of the French state in the allocation of credit was ubiquitous but it was not centralized. It would be a mistake to describe the state as a central planner that chose the precise quantity of credit that each sector of the economy had to receive.

First, the state was not a unified body. Coordination did take place between the Banque de France, public banks and credit institutions and the Treasury, but most of it happened at a very broad level and these administrations agreed on general objectives only. Each administration had different practices and different objectives. The organization of nationalized banks was close to the one of private banks (Kuisel 1984, Bonin 2003). All studies of the French Planning office have shown that - except maybe for the 1st Plan -

¹³State interventions in the credit market in capitalist developing countries also led to well known failures (Mc Kinnon 1973, 1993, Mayer 1989)

the guidelines provided by the Planning office were too large to have a direct influence on bank's lending decisions (Baum 1958, Andrieu 1984, Rousso 1987). Their direct influence was restricted to the Treasury loans. It is impossible to quantify the extent of informal coordination between these institutions. It was certainly important, notably because the high civil servants often moved from one institution to the others during their careers, but each administration also had a strong peculiar culture.¹⁴

Second, most of the interventions were indirect. This was especially the case for the Banque de France and the CNC. Providing information, giving incentives to banks through the discount window, backing projects or investments realized by private firms or banks, were the main tools of public intervention. The line between "public credit" and "private credit" was thin. And no statistics attempted to do such a distinction at that time.

The direct or indirect instruments of state intervention in the allocation of credit were numerous. I propose to distinguish five main types of intervention.

Loans from the Treasury.

These loans were financed by the government budget and were associated with long-term projects designed by the Ministry of Finance. Most of them were directed to regional and local authorities (notably through the *Fonds national d'aménagement du territoire*). Another part was directed to firms, especially through the *Fonds de développement économique et social* (FDES). Even though the FDES funds to firms had been crucial for some sectors (mainly siderurgy and gas and electricity supply) they remained limited compared to the total amount of medium and long-term credit in the economy as seen in Table 1. Most of the FDES funds were granted by the Treasury but some were granted by the *Crédit National* or the *Caisse des dépôts and Consignations* (CDC). Most of these funds were deemed a sequel to the Marshall plan investments. The allocation of these funds clearly followed government policies but it maintained managerial independence within firms (Quennouëlle-Corre 2000, p. 113-120). Starting the mid-50s, CDC loans

¹⁴Recent historical studies on French administrations have shed light on the singular culture that characterized each of them and often prevented smooth coordination despite the shared goal of French reconstruction and modernization. See Mioche (1987) on the Planning office, Margairaz (1991) on the Ministry of Finance, Quennouëlle-Corre (2000) on the Treasury, Feiertag (2006) on the Banque de France. In Monnet (2011a, 2011b) I have also pointed out the frequent conflicts between the government and the Banque de France as well as the lack of real coordination between the CNC and the Planning office.

replaced the FDES loans in many sectors, especially housing and construction. The role of the FDES also decreased because French nationalized firms had an easy access to the financial market and the Vth Republic decided to decrease the number of loans financed by budget deficits.

Year	1948	1951	1954	1957
FDES loans to nationalized firms (from the Treasury)	143	132	118	118
FDES loans to private firms (from the Treasury)	0	19	21	14
FDES loans to private firms (from public institutions)	0	56	56	52
Total FDES loans	143	207	195	184
Total medium and long-term credit in the economy (<i>crédit d'investissement</i>)	178	1074	2465	4570

Sources: CNC reports and notes of DGC, 1958.

Table 1: FDES loans, 1948-1957 (billions francs).

Loans by public and semi-public sector (organismes spécialisés).

Several credit institutions had been created by the state and were closely supervised. Contrary to nationalized banks whose lending decisions were usually not affected by governments, these institutions were asked to follow the main orientations of the national credit policy (Wilson 1957, Brunhoff 1965).

The *Crédit National* and the *Caisse des dépôts et consignations* (CDC) specialized in financing of machinery and equipment. The *Crédit Foncier* aimed to finance housing. Public housing was financed by the CDC rather than by the *Crédit Foncier* (Effosse 2003).

Agricultural credit was mostly financed by the *Caisse nationale du Crédit Agricole* (CA), a public corporation that enjoyed financial autonomy but could received guidelines from the Ministry of Agriculture. It has been closely associated with government policies that aimed to modernize French agriculture, but loans' decisions were not taken by the Ministry. Gueslin (1988, p. 110) described the CA as a compromise between farmers, the state and the bank's employees. Contrary to the *Crédit Foncier*, it was a mutual savings bank that mostly received deposits from farmers. In the early 1970s, the CA financed around 80% of the total of French agricultural credit and 96% of French farmers had an account at the CA (Gueslin, 1987). It was the third bank in the world in size of deposits (Le Bourva, 1979).

In the field of the financing of small and medium-sized firms, the *Banques populaires* were what the *Crédit agricole* was to agriculture. Both institutions were founded in the

XIXth century and derived from the same stream of thought which sought in cooperative enterprise an answer to the difficulties of raising funds in competition with larger banks. After the war, the French government took over these institutions and supported their development. Within the *Banques populaires*' group, the *Crédit hôtelier* was crucial for the financing of hotels and restaurants.

These various institutions were named *organismes spécialisés de crédit*. Except for the CDC which received orders from the Treasury to invest in some specific sectors and whose loans to construction could be integrated automatically in the government budget (cf. Monnet 2011a), they enjoyed managerial independence. They also constantly made profits. They reflected the willingness of the French state to target some sectors (housing, agriculture etc.). The support of the state prevented other banks to enter these sectors. These institutions could lend at below market rates, that is preferential rates. According to a retrospective study written at the Banque de France in 1983, 49.5% of French loans were granted at a preferential rate in 1969 and 40.8% in 1975. A 1968 survey (Bonnet 1968) shown that in 1959, 34.25% of long-term loans were granted at a rate below the discount rate of the central bank, 37.5% at a rate between the discount rate and the bond market rate, and 28.25% at a rate at least equal to the bond market rate. These figures were 30.5%, 45% and 24.5% in 1964.

Rediscounting

The intervention of the state through rediscounting should be distinguished from direct loans. This type of interventions aimed to encourage the development of both private and public banking loans rather than to provide a substitute to banking loans. Since the XIXth century, the role of the Banque de France in rediscounting commercial paper had been an important feature of the French financial system (Baubeau 2004, Bazot 2010). This role increased after WWII and rediscounting facilities were extended to medium-term credit (usually defined as up to 5 years).¹⁵ The *Crédit Foncier*, *CDC* and *Crédit National* could rediscount medium-term banking loans and they could also ask the Banque de France to rediscount the loans they had already rediscounted. "In this way, the semi-public and public institutions in Paris fill a role in the medium-term field analogous to that of the discount houses in London with regard to short-dated paper "(Wilson 1957,

¹⁵In 1965, the definition of medium-term credit to housing was extended to 7 years.

p. 192). Rediscounting was thus a powerful tool used by the central bank and some *organismes spécialisés* in order to both encourage the development of banking loans and affect their allocation. The total value of rediscounted loans by public institutions is not necessarily a good measure of the extent of state intervention in the allocation of credit. The promise to rediscount is as important as the actual amount of rediscounted papers. The Banque de France used rediscounting to affect credit allocation in three ways. First, from 1948 to 1972, each bank was assigned a rediscount ceiling. There were no fixed rules for setting the amount of these ceilings. When banks asked the central bank to increase them, negotiations took place at the *Direction générale de l'escompte* (DGE)¹⁶. The main criteria applied by the DGE were the amount of deposits in banks' balance sheets and their "economic utility", especially their ties with industries at the local level. A well known characteristic of this period was the number of sectoral banks which were created to support their respective industries (Wilson 1957, Burgard 1989, Plihon 1993). Some had been created by the big nationalized banks, others by firms that pooled their funds. They included for example *Crédit naval* (shipbuilding), *Crédit hôtelier* (hotels and restaurants) or *Pétrofigaz* (oil and gaz). Hence, rediscounting loans from such banks (or increasing their discount ceiling at the central bank) was an easy way to support a sector.

Second, the Banque de France accepted to rediscount housing and construction loans up to 7 years in 1966, thus supporting the development of these two sectors.

Third, the Banque could issue guidelines and send information to banks, saying that it would rediscount loans granted to some sectors and specific economic activities. It could also give directly advice to banks. The Banque issued such general recommendations at the national level (for the production and storage of butter, sugar, canned product until the mid-1950s, for housing afterwards). It mainly used them at the local level through its 220 branches as it can be seen in the Economic reports of branches' directors *Résumé des rapports économiques des directeurs des succursales*. The branches of the Banque de France (helped by the CNC and DGC) surveyed the needs of the sectors at the local level and then told the banks their advice to invest. It was implicit (and sometimes explicit) that the Banque de France rediscounting policy would be in accordance with these guidelines. For example, when the French economy increased its openness to trade

¹⁶Amount of ceilings for some years as well as discussions over whether they should be increased are found in ABF, 1360200701/239, 1360200701/72, 1397200602 /12

in 1959,¹⁷ the General direction of Credit (*Direction générale du crédit*) of the Banque de France implemented a large survey in order to measure the reactions of some sectors that were supposed to suffer from trade liberalization. It asked the directors of the branches of the Banque de France to gather information on firms. By doing so, they used sectoral categories of the CNC and *Service central des risques* rather than the large sectors of the Plan.¹⁸ Then the CNC encouraged the branches and the banks to use this information to compare the performance of firms in their local area to the national performances. Fourthly and finally, for some very specific activities only, the central bank announced publicly the maximum amount of loans it would rediscount. Nevertheless, it seemed that these techniques were limited to agricultural credit and credit to exports and were not used frequently. Appendix 1 shows one example of such commitment to rediscounting: loans for the storage of every cereals had a rediscount ceiling from 1960 to 1966. Such a central bank's policy was complementary to the price controls that prevailed in agriculture all over the period.

It should be noted that, whatever the means used to influence credit allocation (discount ceiling, guidelines, commitment etc.), the central bank always specified that rediscounting was contingent on the justification of real needs and would not take place automatically. And the original lending bank always bore the risk of possible default by the borrower.

Exemptions.

This tool was used by the Banque de France in order to favor some sectors or activities when limits on credit expansion were imposed. Such exemptions replaced rediscounting as the main tool of credit selectivity in the mid 1970s when the *encadrement du crédit* became permanent (Monnet 2011a, 2011b). In the 1960s, they were used to support housing credit and mostly credit to exports. Credit to exports was always exempted from quantitative controls during the episodes of restrictive monetary policy from 1948 to the early 1980s.

Compulsory guidelines.

I have found only few evidence of compulsory guidelines that forced the banks to lend (or to prevent lending) to specific firms or sectors. These were certainly not the main instrument of public intervention in the allocation of credit. The few examples available

¹⁷In 1959, 90 % of the importations from OECD countries are totally liberalized. They were only 40% in 1958.

¹⁸ABF, 1331200301/10. Lettres de H.Fournier.

in the archives of the CNC are related to agricultural credit only and were intended to avoid overproduction. The Planning office neither used nor recommended such practices but further research may find that similar guidelines had been occasionally issued for other industries. In the early 1960s, the Ministry of Agriculture decided to control the loans to the chicken farming business because it was worried by overproduction and big inventories. Thus, in July 1961, it asked the Banque de France and the CNC to prevent banks from lending to businesses that raised more than 5000 chickens. The limit was then extended to 16000 chickens in 1963.¹⁹

This “chicken” example is not representative of the central bank’s interventions in the allocation of credit throughout the *dirigiste* period. On the contrary it shows that the Banque de France had the legal and institutional power to impose quotas of loans to specific sectors or products but it decided not to use it and to rely instead on other kinds of incentives that let the ultimate responsibility of the decisions to bankers.

3.2 Objectives of credit selectivity.

Since the decisions were not centralized, it is not an easy task to identify exactly the objectives pursued by the administrations, banks and *organismes spécialisés*. The main rhetoric of the Planning office and the CNC was to foster productive investment and to serve social and national interests. But the question remains about the criteria chosen to define such vague terms as “economic utility” or the “national interest”...

In the late 1940s, the CNC issued recommendations to banks in order to avoid shortage in food and raw products supplies while the Plan focused on the development of energy and metallurgy (Baum 1958, Bauchet 1964). It was obviously justified by the need for economic reconstruction.

In the following decades, how were the needs of the economy identified and some specific industries targeted? According to CNC reports and Banque de France notes, the main objectives of credit selectivity were to promote exports and thus solve balance of payments problems, to avoid overproduction and to limit inventories in some sectors, to increase regional development, to meet social needs such as housing and, finally, to help creative destruction. Interesting examples of how the Banque de France rediscounting policy attempted to foster creative destruction occurred in the mid 1950s. The summaries

¹⁹ABF, 1331200301/10. Letters from the Ministry of Agriculture to the Governor of the Banque de France.

of the reports from the directors of the branches of the central bank in 1954-1955²⁰ point out that many branches noticed that retail stores in the early 1950s were run by people that were not enough qualified and that they maintained prices that were too high. Bankruptcies in this sector increased largely in 1953 but the directors of the branches of the Banque de France agreed that these exits were a necessary cleansing (“cet assainissement dont on s’accorde à reconnaître la nécessité”). The Banque de France decided to follow government policies aiming at developing department stores, and thus to let many retail stores fail. The same reports pointed out the necessity to decrease quantities but to improve the quality of farming production. A 1959 study at the Banque de France intended to provide branches with a detailed comparison of the solvency ratio and investment/debt ratio of firms across some small sectors at the national level: the aim was notably to avoid that firms in some areas received too much credit if their investment/debt ratio was too low compared to the national average (and vice versa). It is impossible to track every decision that was taken inside the Banque de France and the Treasury or by the banks, but it should be recognized that there were a variety of criteria and objectives and that these choices did not necessarily encourage the financing of incumbents.

Two questions must be now addressed in order to discuss whether the “nationalization of credit” has been a successful institutional design: was credit misallocated? did “investment credit” contribute to sectoral growth?

3.3 Data sources

To answer these questions, I use the sectoral data on credit computed by the CNC. This quarterly source is very rich and original. To my best knowledge no equivalent statistics have been used to investigate the causes of the postwar European growth in another country. Contrary to most sectoral data about firms’ financing that rely on debt (Rajan and Zingales 1998, Levine et al. 2000, Arellano et al. 2010), this source really allows us to study the allocation of loans rather than the leverage or external financing of firms. The focus of this dataset (hence this paper) is on the lending decisions of the banks, the state and the specialized credit institutions.

²⁰ABF, Résumé des rapports économiques des directeurs des succursales. 1er août 1954 - septembre 1955.

The statistics are very detailed and include 100 sectors. For some sectors, sub-sectors are also reported. Credit data are stocks, that is outstanding loans at the end of the quarter, and not the flows of new loans. Despite its richness, this source raises three problems.

First there was a lower limit on credit that had to be declared by banks (50 000 “ nouveaux ” francs until 1962 and 100 000 thereafter). But this very small amount is a minor issue that is not likely to matter for loans that financed investment and growth.

Second, these statistics were constructed from declarations by bankers themselves. The CNC imposed controls and sanctions in case of cheating so the data are likely to be reliable. But for some years (especially during credit control episodes), bankers may have misreported numbers in order to escape the ceilings imposed by the Banque de France. This possible misreporting would nevertheless affect the level of credit reported by a bank and not its allocation. One problem - well-known by the Banque de France at that time - was that banks tended to under report loans of the last quarter of a year and to report the numbers on the first quarter of the following year. The use of yearly data will diminish this problem.

Third, the exact duration of the loans is not specified. We only know the total stock of credit at each end of quarter. It is impossible to calculate exactly the new flows. Fortunately, the data are quarterly and distinguish between 3 months commercial bills (*Effets commerciaux*) and other short-term loans (*Autres crédits à court terme*). The main problem thus concerns short-term credit between 3 months and one year: if I add the quarterly figures in order to compute the annual stock of credit received by a sector, then some loans will probably be counted twice. If I take the end of the yearly value, I will miss 6 or 9 months loans. I will present the way I dealt with this problem in the description of the variables (section 5).

Finally, the last issue is that the statistics of the CNC only include credit and not any other sectoral information. Fortunately, the tax administration used sectoral data whose categories were very close to CNC's categories. I then match the credit statistics from the CNC with the corporate tax statistics. Such a matching between statistics produced by two different administrations obviously comes at a cost since some categories are not the same or are not continuous. This is especially true for either the very small or the broadly defined sectors. I thus had to restrict the sample to 49 sectors. In 1968, the CNC and the Ministry of Finance decided to match the two databases. I was thus able to use the 1968 conversion table to recover some categories. But it is impossible to recover

all of them. Most of the sectors that are lost are either very small and non-industrial sectors (as toys, theater or music instruments) or big public sectors that did not receive credit from banks (as the defense industry, the army, hospitals and the public cultural industry). Unfortunately, I also could not match the data on the banking and insurance industries.²¹ In 1971, the INSEE (National Institute of Economics and Statistics) and the Ministry of Finance decided to implement a new nomenclature that radically changed the way the economy was considered: sectors were then defined by their function rather by the kind of activity (Desrosieres 1972). In 1975 the tax and the CNC statistics were completely changed in order to follow the new INSEE nomenclature, and there is no way to recover the ancient categories except at a high level of aggregation only (10 sectors). The 49 sectors in my sample amount to 58% of turnovers in the economy, 50% of firms, 69% of the wages, 76% of investment and 65% of credit on average over the period 1954-1974. These shares are pretty stable over the 20 years but slightly decreasing overall: 70% of the total of credit in 1954 and 64% in 1974; 60% of turnover in 1954 and 56% in 1974.

The corporate tax statistics are not complete before 1954: only the number of firms and the turnover is reported. There are two regimes in the French corporate tax system: *forfait* and *bénéfices réels*. The firms in the first category are small and pay a fixed amount negotiated at the sector level, whereas the firms in the second category pay a proportion of their profits. The information available from 1954 to 1974 in the tax statistics are the following: number of firms, number of employees, inventories, investment, wages and turnover. Starting 1968, much more information is available including debt, depreciation (*amortissement*) and purchases.

4 The allocation of credit

4.1 The marginal product of capital and credit allocation

The standard neoclassical theory states that an efficient allocation of credit should equalize the marginal product of capital (MPK) across sectors. When there is a high return in one sector, capital and investment flow towards this sector. Then this sector's MPK will decrease respectively to other sectors and its value will converge to others. Financial in-

²¹It is due to the fact that the credit data for banks and insurances are not continuous.

intermediation promotes growth in the way that it allows this mechanism to work efficiently and then to allocate capital in sectors marginally more capital productive (Greenwood, Jovanovic, 1990).

Following the work of Lucas (1990) and Caselli and Feyrer (2007) on capital flows across countries, I simply calculate the MPKs for each sector of the French economy and then compare them to the sectoral amount of loans.

Using a standard Cobb-Douglas function, the MPK is defined as the real return to capital $R = \alpha Y/K$, with α , the capital share. There are many difficulties to calculate this number. A good measure of capital is illusory. But from the investment data, it is possible to recover an approximation of the capital stock with the usual accumulation equation: $K_{t+1} = (1 - \delta)K_t + I_t$.

The calculations of the capital/labor share is also subject to many caveats. I had no better choice than to calculate α and δ from the data of the early 1970s (which are more reliable and complete for wages) and to suppose them constant from 1954 to 1974. Values of these parameters for the whole time span were either impossible to obtain (for depreciation rates), or highly implausible (for the capital/labor shares) due to some imprecisions in the wages and the inability to take into account the purchases. The assumption of constant parameters is strong but not so harmful since the sample starts in 1954, after the immediate reconstruction of the economy. The depreciation rate of capital was probably higher in the late 1940s. I prefer to calculate a value of α for each sector despite the inevitable imprecisions rather than to assume that $\alpha = 0.3$ for all the sectors as it is done in many cross-countries studies. Regarding the initial capital stock, I make the standard assumption (Levine et al. 2000, among others) that capital was at its steady state at the beginning of the sample.²² It is more realistic than to assume that the initial capital stock was equal to zero in 1954. The details of the construction of the credit variables are presented in the next section (4-3).

An efficient allocation of credit is characterized in theory by a positive relationship between the MPK and the amount of loans. Figures 4, 5 and 6 show the correlation between sectoral MPKs and sectoral outstanding loans for each year of the sample.²³ The values of the correlation for the whole sample are reported in Table 2.

²²That is $K_{1954} = I_{1954}/\delta$.

²³I scale MPKs by the turnover of each sector in order to present values of the credit variable between 0 and 1 on the graphs.

A positive correlation appears between medium and long-term credit and MPKs but not between short-term credit and MPKs. The “investment credit” thus fulfilled its purpose, that is to finance the industries with a higher return and then to promote the reallocation of capital across sectors. On the contrary short-term credit is either non significantly or negatively correlated to the MPK. The interpretation of this result can be twofold: first short-term credit is mainly intended to furnish liquidity for commercial transactions and has no relationship with investment and capital allocation and, second, short-term credit is used by firms that are low productive with a low MPK and have no access to long-term financing.

The theoretical discussion in the previous section had highlighted that the choice of medium-long-term credit versus short-term credit by firms is not obvious. If poorly implemented, state interventions that favor medium and long-term loans could lead more productive firms to signal themselves as less risky and demand short-term financing whereas bad firms would have a debt overhang. We are not able to distinguish precisely between public and private credit, but we know that state intervention supported more medium and long-term financing relatively to short-term loans. The graphs thus suggest that these interventions did not create an adverse effect on the relative efficiency of long-term loans.

Since, at a first sight, the graphical relationships may seem to be driven only by the biggest sectors that received more credit (on the extreme right of the graph), Table n°2 displays the correlations (and their significance) for a sample with or without the 12 “credit intensive” biggest sectors of the sample, that is the sectors with a higher ratio of total credit on turnover.²⁴ There are chemical, iron (mining), electricity supply, gas supply, siderurgy, oil production, railways, construction, automotive, paper, foundry and aeronautics. The correlations are for the whole sample (20 years).

The results in Table 2 show that the positive correlation between MPK and investment credit is still significant, although smaller, for the smallest sectors.²⁵ The fact that the relation between the MPK and short-term credit is significantly negative (due to the biggest sectors) tends to confirm that there was a substitution between the two types of credit: firms that demanded short-term credit had a lower productivity of capital and thus experienced more difficulties to have access to financing at a longer maturity.

Table 3 shows that the correlation between the number of employees and credit is

²⁴We scale credit by turnover in order to obtain number between 0 and 1 for the correlations.

²⁵It is still statistically significant for around 1/3 of the sectors.

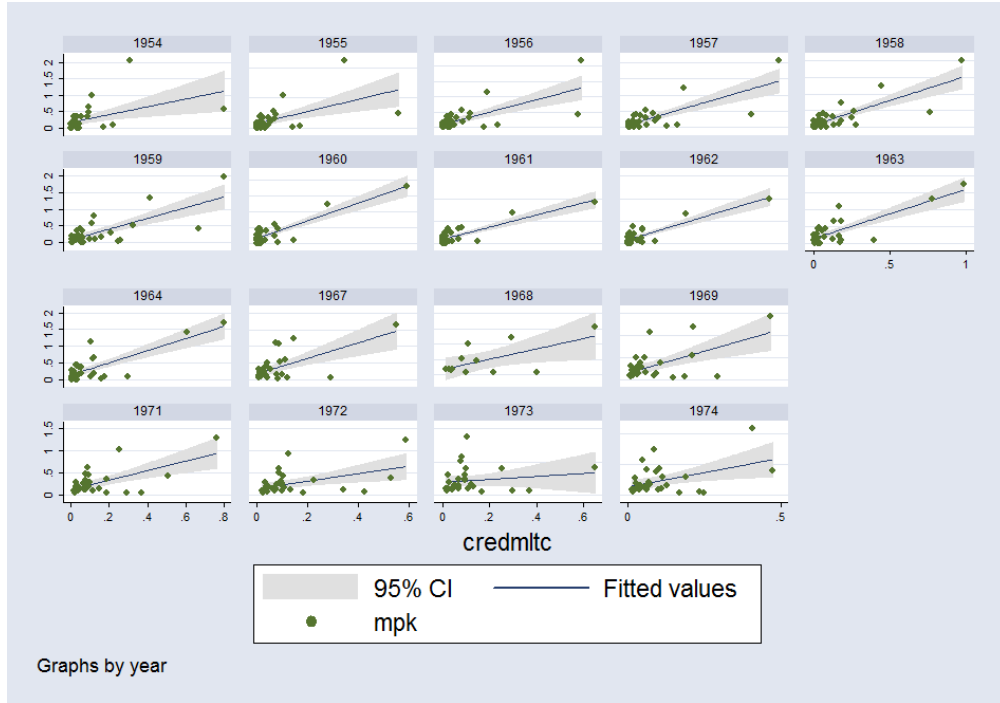


Figure 4: Yearly correlations between medium-long-term credit and MPKs.

	Total	Smallest sectors (3/4)	Biggest sectors (1/4)
Short term credit	- 0.07 *** (0.00)	0.02 (0.55)	- 0.10 *** (0.00)
Investment credit	0.32 *** (0.00)	0.12 *** (0.00)	0.31 *** (0.00)
Total credit	0.28 *** (0.00)	0.13 *** (0.02)	0.26 *** (0.00)

Note: p-values in parenthesis.

Table 2: **Correlations between MPK and credit**



Figure 5: Yearly correlations between short-term credit and MPKs.

not of the same sign as the previous one. The correlation between “investment credit” and the number of employees per sector is not significant though positive. A political economy argument that would explain the allocation of credit in the *dirigiste* French economy only by the willingness to maintain a high level of employment and to finance workers’ rents would then miss the point.²⁶

	Total	Smallest sectors (3/4)	Biggest sectors (1/4)
Short term credit	0.62 *** (0.00)	0.67 *** (0.00)	.40 *** (0.01)
Investment credit	0.87 (0.49)	0.26 (0.63)	0.43 (0.38)
Total credit	0.7 *** (0.00)	0.69 *** (0.02)	0.8 (0.43)

Note: p-values in parenthesis.

Table 3: **Correlations between number of employees and credit**

²⁶It was suggested by Crafts (1992) and by Sicsic and Wyplosz (1996) about France but without quantitative evidence.



Figure 6: Yearly correlations between total credit and MPKs.

4.2 Convergence?

According to the neoclassical theory with perfect financial markets, the MPKs across sectors (or countries) should converge overtime if funds are well allocated.

From the database, I can compute the mean and the standard deviation of the sectoral MPKs for each year in order to characterize the evolution of the marginal return over the French Golden Age. They are reported in Table 4. The average value of MPKs is high but plausible according to other studies which have computed the global return for the whole economy. Sylvain (2001) found an average of 26.5 % over the period 1965-1973 in France using investment of firms (except housing). Caselli and Freyer (2007) found that in 2000, France had a MPK of 10%, the US, 12%, and many middle-income countries, like Mexico, Bolivia, Chile, Turkey, had an MPK between 20 and 30%. It is well known that the MPK decreases with economic development. Using the series of investment by firms from French national accounts data over the period, and making standard assumptions ($\delta = 0.6$ and $\alpha = 0.3$), I also find numbers that are consistent with the average sectoral MPKs. I report them in Table 4 as “National accounts”. The higher average value of

year	mean	sd	National accounts
1954	0.24	0.38	0.24
1958	0.26	0.38	0.26
1962	0.29	0.39	0.26
1966	0.30	0.38	0.27
1970	0.26	0.27	0.24
1974	0.23	0.22	0.22

Table 4: **Mean and standard deviation of sectoral MPKs**

MPKs found in the sectoral data may be explained by the fact that the missing sectors (see *supra*) were more labor intensive and had probably a lower MPK.

The standard deviations in Table 4 show that there have been a convergence of sectoral MPKs overtime. As already highlighted by Mairesse 1971, Bénard 1971 and Sylvain 2001, I also find that the return of capital started to decrease in the early 1970s.²⁷

Unfortunately, we lack international comparisons to state whether the sectoral convergence was rapid or slow given the high growth rate of the French economy at that time. This section has shown that there was a positive correlation between MPKs and credit - essentially due to “investment credit” - and that there have been a convergence across MPKs over time. Such a result is remarkable since it gives evidence that a *dirigiste* economy with a high degree of state intervention can be consistent with the neoclassical predictions about capital allocation and growth. Still, short-term credit appears to have been misallocated. Is it a normal feature of this type of credit to serve other purposes rather than financing investment and capital accumulation?

Whether the correlation and the convergence could have been higher and whether state intervention in the allocation should have been weaker or stronger, also remain open questions.

4.3 Credit within sectors

For what purpose firms asked for loans? Why did banks lend to firm? To answer these questions, I run simple panel regressions that show the variables that were associated

²⁷Mairesse and Bénard nevertheless used different definitions of the return to capital: they divide profits by capital.

with each maturity of credit. Panel data estimations with fixed effects are well suited to investigate the determinants of credit over time within a sector, as done by King and Levine (1993) for countries' level of financial development.

The variables used in the regressions are constructed as follows:

- *Investment* and *Turnover* come from the tax records. I add the two regimes (*forfait* and *bénéfices réels*).
- *Short-term credit*. In the CNC statistics, there are two types of short term credit available: *escompte* (3 months commercial bills) and other short term loans. The original data are quarterly. To obtain the annual total amount of *escompte*, I simply add the quarterly values. It may bias the total amount upward since the same 3 months bills can be registered in two subsequent quarters. This might not be a problem for the estimations of the impact of credit on growth within a sector as long as the seasonality of commercial bills is relatively similar over years. The other short-term loans usually lasted between 3 months and two years. I use two alternative methods to compute their total annual stock: I pick the highest quarter value or the mean of the four quarters. The two methods actually do not differ very much since the amount of these loans is quite stable over the year. The estimations results that will be reported in the paper use the second method but there is no difference in the main results when using the first method.
- *Investment credit*. I simply pick the end of the year value of the column *Credit d'investissement* in the CNC statistics. It includes all types of medium-term credit (including rediscountable credit) and of long-term credit (including the FDES loans).
- *Credit control* is a measure of monetary policy whose construction is derived in Monnet (2011b). Monetary policy worked through quantitative credit controls all over the period rather than through interest rates. In Monnet (2011b), I follow a narrative approach (Romer and Romer 1989) to identify the months when monetary policy was restrictive. The yearly variable *Credit control* is the number of

months of restrictive monetary policy during the year. This variable takes a different value when dealing only with “investment credit” since medium and long-term credit was exempted of controls in 1969. Otherwise, I use the general measure.

- The three variables *Investment/wages*, *STC/MLTC* and *Turnover/nb firms* are intended to account for sectoral characteristics that may vary overtime within a sector and thus not be taken into account in the fixed effects. The ratio *Investment/wages* is a proxy of the capital intensity of the sector.²⁸ When it takes a high value, the sector has a high capital intensity. The ratio *STC/MLTC* (short-term credit / medium and long-term credit) measures the propensity to use preferably one type of credit relative to the other. Finally the ratio *Turnover/nb firms* is a rough proxy of the concentration of the sector.

First, I am interested in how the current value of outstanding loans in one sector is predicted by the past values of the sectoral variables (including the past value of outstanding loans). We are not talking about causation here since the past value of investment is certainly affected by the future amount of the loans. The purpose is mainly to see whether, once we account for sectoral fixed effects, the evolution of credit overtime is only path dependent (i.e. determined by the previous amount of credit) or whether it is correlated to the evolution of other sectoral characteristics.

I run the regressions for the whole sample and then distinguish between the 12 biggest (i.e more credit intensive) sectors and the 37 others (Tables 5, 6 and 7). The variables are in real terms in order to avoid the potential bias due to the years of inflation peaks (especially 1957 and 1968). I divide the nominal values by a price index. I use ten official price indices published by INSEE (1981) and I match each sector to the activity price index to which it corresponds.

The results show that the current values of short-term and “investment credit” are positively correlated with their own past values as well as with the past values of investment and turnover. As expected, outstanding loans are highly path dependent. The

²⁸I use investment rather than capital because the construction of capital data (*supra*) is subject to assumptions that may bias the regressions in the first years. Nevertheless, robustness checks with capital do not affect the main results.

past value of short-term credit has a coefficient of 0.54 and the past value of medium and long-term credit has a higher one, 0.79. The fact that this coefficient is even higher for the total credit means that there were substitutability between the two maturities of credit (Table 5). But this difference is only due to the biggest sectors (Table 6). On the contrary Table 7 shows that in the smallest sectors, short-term credit is more path dependent than “investment credit”. The ratio *investment/wages* is positively correlated with “investment credit” but negatively correlated with short-term credit. This result clearly confirms that medium and long-term credit is used by more capital intensive firms. The negative correlation between “investment credit” and the ratio *STC/MLTC* also illustrates the substitutability between the two types of loans: when a sector has access to more “investment credit”, its demand for short-term credit decreases relatively to its demand for medium/long-term credit.

The impact of monetary policy on credit shows two interesting results: first, as a whole, monetary policy impacts both types of credit in a very similar way (the coefficients have very close values, around 0.01) and second, the biggest sectors are more protected from monetary restrictions. It means that “investment credit” was not protected, in itself, against restrictive monetary policy, but that some sectors were isolated (for reasons independent of the type of credit they used). It could be explained either by a credit channel effect (due to asymmetric information) as studied by Gertler and Gilchrist (1991) for the US economy or by the fact that the biggest sectors were given priority.

VARIABLES	(1) CRED (total)	(2) CRED (short-term)	(3) CRED (medium-long-term)
CRED Lag_1	0.851*** (0.0271)	0.548*** (0.0369)	0.792*** (0.0254)
Turnover_1	0.208*** (0.0576)	0.227*** (0.0724)	0.168** (0.0814)
Investment_1	0.0956** (0.0447)	0.208*** (0.0586)	0.113* (0.0621)
Turnover/nb firms	-5.42e-06 (2.57e-05)	-2.11e-05 (3.36e-05)	-3.98e-05 (3.65e-05)
Investment/wages	0.0132** (0.00572)	-0.0128* (0.00761)	0.0198*** (0.00759)
STC/MLTC	-8.71e-05 (0.000725)	0.000929 (0.000955)	-0.00689*** (0.00109)
Credit control_1	-0.0112*** (0.00191)	-0.0109*** (0.00252)	-0.0155*** (0.00284)
R-squared	0.871	0.749	0.910
Number of sectors	49	49	49

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5: The determinants of credit (all sample)

VARIABLES	(1) CRED (total)	(2) CRED (short-term)	(3) CRED (medium-long-term)
CRED Lag_1	0.795*** (0.048)	0.399*** (0.062)	0.810*** (0.039)
Turnover_1	0.16 (0.116)	0.131 (0.377)	0.239* (0.134)
Investment_1	0.007 (0.095)	0.341*** (0.124)	0.12 (0.107)
Turnover/nb firms	-0.001 (0.00)	0.001 (0.00)	0.001 (0.00)
Investment/wages	0.008 (0.009)	-0.03** (0.004)	0.020** (0.009)
STC/MLTC	0.004** (0.002)	0.005* (0.003)	-0.007** (0.002)
Credit control_1	-0.004 (0.004)	-0.001 (0.00252)	-0.005 (0.005)
R-squared	0.911	0.784	0.932
Number of sectors	12	12	12

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 6: The determinants of credit (big sectors)

VARIABLES	(1) CRED (total)	(2) CRED (short-term)	(3) CRED (medium-long-term)
CRED Lag_1	0.806*** (0.048)	0.817*** (0.0311)	0.783*** (0.023)
Turnover_1	0.090 (0.079)	0.003 (0.05)	0.100 (0.085)
Investment_1	0.076* (0.041)	0.122*** (0.042)	0.183* (0.063)
Turnover/nb firms	-0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
Investment/wages	0.006 (0.007)	0.012* (0.007)	0.017* (0.010)
STC/MLTC	-0.001 (0.000)	0.001 (0.000)	-0.006*** (0.001)
Credit control_1	-0.010*** (0.002)	-0.011*** (0.002)	-0.016*** (0.0028)
R-squared	0.899	0.822	0.912
Number of sectors	37	37	37

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 7: The determinants of credit (small sectors)

5 The effects of credit development on growth

In section 2, I have shown that the allocation of “investment credit” across sectors meets the criteria of efficiency of the neoclassical theory. A positive significant relationship between the MPKs and “investment credit” at the sectoral level means that the sectors received enough funds to perform an efficient allocation of factors. If the neoclassical theory is correct and if financial intermediation really favors the allocation of factors (Greenwood and Jovanovic 1990, Acemoglu and Zilibotti 1999), then we should also observe a positive impact of “investment credit” on the real growth rate of sectoral investment and income. Crafts (1992) estimated that the contribution of capital accumulation to growth in France over the period 1960-1973 was 2.4 while the contribution of labor inputs was 0.3 and TFP 2.34. If “investment credit” did increase investment and capital accumulation, then its effect on production growth was probably large.

On the other hand, the role of short-term credit for growth is still puzzling since it was negatively correlated to the MPKs of the biggest sectors but the previous regressions have shown that it was positively associated with investment and turnover.

In this section, I use a dynamic panel approach with the General methods of moments (GMM) estimator to measure the effects of credit on the growth of investment and turnover. The GMM estimator is designed to avoid the well-known endogeneity bias that is inherent to the relationship between credit development and growth. It has been used extensively to investigate the causal links between finance and growth across countries (Levine et al. 2000, Favarra 2003, Bordo and Rousseau 2011) and across firms (Rousseau and Kim 2008), or the links between credit busts and growth (Ranci ere, Tor-nell, Westermann 2008).

By using a panel data set, we have sufficient degrees of freedom and we can investigate whether financial development within a sector had an effect on the real growth rates. The equation to be estimated is

$$\pi_{i,t} = \eta_i + \alpha' X_{i,t} + \epsilon_{i,t}$$

where π is the growth rate of real investment or turnover and X are variables that can influence these two dependent variables. X especially includes credit development, that is the ratios *short-term credit/turnover* and *investment credit/turnover*. Dynamic panel estimations can control for the unobserved sector-specific effects. It is crucial since the

information about each sector is limited only to tax data.

$$\pi_{i,t} - \pi_{i,t-1} = \eta_i + \alpha'(X_{i,t} - X_{i,t-1}) + \epsilon_{i,t}$$

But the equation above suffers from an endogeneity problem. The amount of credit is influenced by turnover and investment, that is there is correlation between the variables in X and the residuals ϵ . There is no available instrumental variable that would influence credit to each sector without being correlated to other sector-specific characteristics (and especially the growth rate of investment and incomes). The GMM estimator uses internal instruments, defined as instruments based on previous realization of the explanatory variables. This method relies on the work of Arellano and Bond (1991) and Arellano and Bover (1995). The regression is first differenced to eliminate the country-specific effect:

$$\pi_{i,t} - \pi_{i,t-1} = \alpha'(X_{i,t} - X_{i,t-1}) + (\epsilon_{i,t} - \epsilon_{i,t-1})$$

The endogeneity problem is then obvious since the lagged dependent variable $\pi_{i,t-1} - \pi_{i,t-2}$ will be correlated with $\epsilon_{i,t} - \epsilon_{i,t-1}$. Arellano et Bond (1991)'s strategy is to instrument the difference $X_{i,t-1} - X_{i,t-2}$ by the lagged values of the explanatory variables in levels, $X_{i,t-2}, \dots, X_{i,t-n}$ which, by definition, are not correlated to $\epsilon_{i,t} - \epsilon_{i,t-1}$. The estimation is thus not biased under the assumptions that

$$E[\pi_{i,t-s}(\epsilon_{i,t} - \epsilon_{i,t-1})] = 0 \text{ for } s \geq 2, t = 3, \dots, T$$

$$E[X_{i,t-s}(\epsilon_{i,t} - \epsilon_{i,t-1})] = 0 \text{ for } s \geq 2, t = 3, \dots, T$$

It means first that the error terms ϵ_t should not be correlated and second, that the explanatory variables X_t must be weakly exogenous (i.e. not correlated with the future innovations of ϵ_t). This last assumption does not mean that the explanatory variables cannot be correlated with anticipated values of investment or turnover's growth rate. It only means that future unanticipated shocks to a sector's growth rate do not influence the current level of credit granted to this sector. In other words, the estimation is robust as long as the decision to lend is influenced only by current and anticipated (and not by unanticipated) values of sectors' growth rate. It thus assumes that lenders have rational expectations.

The model is estimated with a two-step GMM procedure and the standard errors are clustered at the sector level to allow for the correlation of errors within a sector

(Petersen 2009). The validity of the instruments is tested through the Sargan test of over-identifying restrictions. P-values of the test are reported in the regression table. A large p-value means that the validity of instruments cannot be rejected. The preferred specifications all have valid instruments.²⁹

In the following regressions, the growth variables (investment and turnover) are in real terms, and the credit variables are divided by the turnover of the sector (and then denoted with “/T”).³⁰

The estimation (Table 8) shows a positive and significant impact of “investment credit” development (measured as the total of investment credit on turnover) on growth (of investment and turnover) within a sector. Once we control for other time-varying sectoral characteristics, the impact on investment and turnover is very similar (0.272 and 0.258 respectively). This effect is important but not huge: if the ratio *investment credit/turnover* increases by 5%, the annual real growth rate of investment will be increased by 1.5%. The impact of short-term credit is negatively significant on investment growth but not significant on turnover growth. It means that the development of short-term credit, conditional on the development of investment credit hampers investments, probably because it reflects a lack of access to financing at a longer term. But this effect is not significant enough on the turnover as short-term credit could be used for other purposes than investment that may affect positively turnover in other ways.

I also run OLS regressions (Table 9) which show that the negative effect of short-term credit on investment would not be observed if we do not account for the endogeneity bias.

The impact of monetary policy is significant, quite strong, and more important on investment growth. One more month of credit restriction will lead to a decrease of 0.4 percentage points and a whole year of credit restriction will result in a loss of 4 percentage points of investment growth.

²⁹Without clustering the standard errors, it appears that all the coefficients are always significant, which confirms the presence of strong correlation of errors at the sector level. It is not surprising with sectoral data since shocks to one specific sector are very likely to be correlated over years. If not controlled, this correlation biased seriously the result as shown by Petersen (2009).

³⁰Real values are obtained using the 10 branches price indices from INSEE (1981) as in section 3.

	(1)	(2)	(3)	(4)
VARIABLES	Investment	Investment	Turnover	Turnover
VARIABLES	(% growth)	(% growth)	(% growth)	(% growth)
Investment (% growth)			0.244*	0.328***
			(0.135)	(0.147)
Turnover(% growth)	0.493***	0.579***		
	(0.137)	(0.101)		
Short-term credit / T	-1.242**	-1.263***	-0.589	-0.212
	(0.644)	(0.392)	(0.199)	(0.233)
Investment credit / T	0.389*	0.272*	0.269**	0.258**
	(0.234)	(0.168)	(0.152)	(0.135)
Credit control	-0.006***	-0.004***	-0.001*	-0.001*
	(0.001)	(0.001)	(0.001)	(0.001)
Investment/wages		0.081**		-0.030**
		(0.032)		(0.012)
STC/MLTC		0.002		0.001
		(0.002)		(0.001)
Turnover/nb firms		-0.001		0.001
		(0.001)		(0.001)
Sargan test (p-values)	0.55	0.69	0.91	1.00
Number of sect	49	49	49	49

Arellano-Bond estimation. Two-step results
Standard errors adjusted for clustering on sectors
Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8: The effect of credit. GMM estimations.

VARIABLES	(1)	(2)	(3)	(4)
VARIABLES	Investment (% growth)	Investment (% growth)	Turnover (% growth)	Turnover (% growth)
Investment (% growth)			0.296* (0.029)	0.298*** (0.029)
Turnover(% growth)	0.682*** (0.067)	0.691*** (0.066)		
Short-term credit / T	0.035 (0.035)	0.04 (0.039)	0.988*** (0.288)	0.966** (0.233)
Investment credit / T	0.818*** (0.218)	0.772*** (0.268)	0.618*** (0.182)	0.558** (0.135)
Credit control	-0.006*** (0.001)	-0.004*** (0.001)	-0.001* (0.001)	-0.001* (0.001)
Investment/wages		0.064*** (0.007)		-0.015** (0.005)
STC/MLTC		0.001 (0.001)		0.001 (0.001)
Turnover/nb firms		0.005* (0.003)		0.005* (0.003)
Number of sect	49	49	49	49

Standard errors adjusted for clustering on sectors

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 9: The effect of credit. OLS estimations.

Using the standard econometric techniques of the “finance and growth literature”, this section has shown that the *crédit d’investissement* was the financial engine of growth of the French Golden Age.

6 Financial development across sectors

Data on credit can also be used to characterize how the process of financial development differed across sectors. The evolution of the ratio “short-term credit/ medium-long term credit” shows a very different pattern across sectors (cf. appendix 2). Finally convergence occurred by the late 1960s. For the biggest sectors that received priority during the reconstructing phase soon after WWII - such as irons, electricity, siderurgy, fuel, chemicals - this ratio is almost constant over the period. It means that they received enough *crédit d’investissement* (relatively to short-term credit) as soon as the early 1950s. The story was very different with sectors such as leather, shoes manufacture, textile trade, fruits trade and canning, as well as with agriculture. The ratio in this sector shows a distinctive decreasing pattern; that is they first lacked medium and long-term credit relatively to short-term, but their access to long-term financing increased overtime.

The catch-up process of the smallest sectors starting the end of the 1950s is associated with a sharp increase of the proportion of medium and short-term credit granted by banks relatively to semi-public specialized credit institutions and the Banque de France (cf. appendix 2, figures 12 to 14). Overall, the share of medium and long-term financing increased during the French Golden Age as shown in appendix 2, Figures 10 and 11.

Such an evolution gives a better picture of the process of financial development from WWII to the 1970s: during the phase of immediate reconstruction after the war, the state gave priority to long-term credit supporting investment in some sectors. These priority sectors were also the more concentrated and capital intensive. The access to “investment credit” became less constrained overtime, notably because the commercial banks and semi-public specialized credit institutions replaced the Treasury as the main long-term lenders. After an initial push by the state in the priority industries, the access to medium and long-term credit spread across other sectors in the 1960s. The second phase of financial development thus helped small firms while the first phase had benefited mainly to the biggest firms in the more concentrated sectors.

Interestingly enough, the recommendations of the branches of the Banque de France in the 1950s regarding the need for restructuring in agriculture and small businesses (cf. *supra*) seem to have been followed. The proportion of short-term financing in these sectors in the 1950s was higher than in the 1960s.

One of the main conclusion of the INSEE (1974) study, was that the reallocation of labor from small businesses and agriculture to industries and services had been an essential

feature of the French postwar economy and an important source of growth. Several cross-countries studies have recently pointed out that such a structural change - that is the reallocation of resources from low-productivity agricultural activities to a highly productive manufacturing sector - was the crucial factor behind the European Golden Age (Temple 2001, Temin 2002 and Alvarez-Cuadrado 2009).

The quantitative data on credit as well as narrative evidence on the choice of policy show that this change was supported in France by credit flows and state interventions in financial allocation.

7 Before 1954 and after 1974

The main limitation of the dataset used in this paper is the rather short time span which prevents us to study the immediate postwar reconstruction and the economic crisis of the 1970s.

It would have been particularly interesting to study the stagnation of investment (resulting in a decrease in the ratio investment/GDP) in the early 1950s.

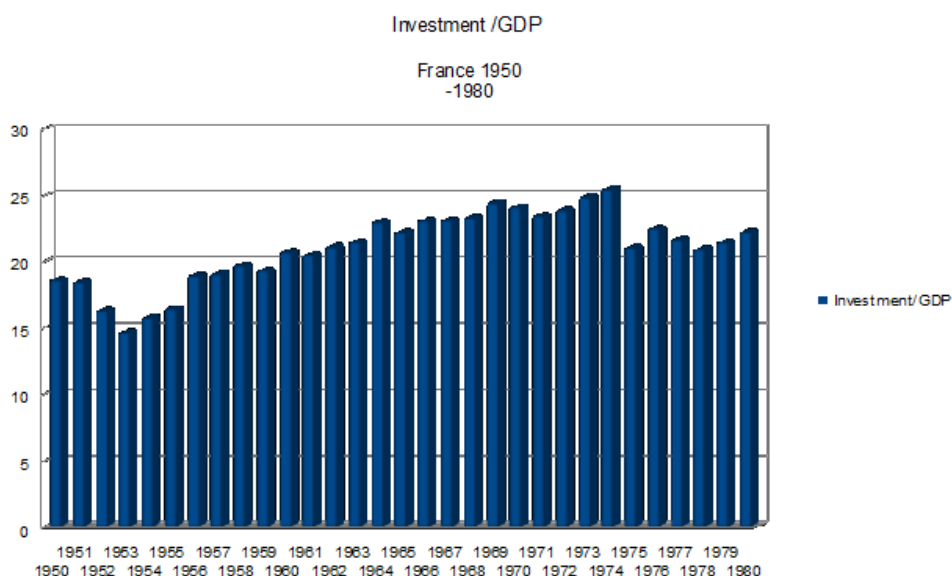


Figure 7: sources: INSEE

The stagnation of investment that took place between 1949 and 1953 is a well known peculiarity of French post-war growth (Mairesse 1971, Bouvier 1979, Bonin 1987, Saint-Paul 1994, Sicsic and Wysplosz 1996). It contrasts with the high rate of growth of GDP in 1950 and 1951. Bouvier (1979) shows that the stagnation of total investment is essentially due to the decrease of investment by nationalized firms and by the construction sector (*BTP*). Carré, Dubois, Malinvaud (1972, p.289) argue that this phenomenon might be explained by the reallocation of capital to productive investment in 1950 whereas the years 1946-1949 focused on the reconstruction of basic equipment infrastructure. Saint-Paul (1994), Sicsic and Wysplosz (1996) argue that it was an inefficient outcome explained by controls on the banking and financial sector. Unfortunately, the sectoral database does not allow us to study the allocation of capital before 1954. None of the explanations

mentioned above can be dismissed or verified in this paper. It should be nonetheless remembered that 1950 and 1951 had the highest growth rate of GDP of the whole decade, which may support Carré et al.'s argument. The growth rate then fell in 1952 and 1953 because of the restrictive monetary policy (Monnet 2011b). State intervention in credit allocation was similar across the 1950s (Wilson 1957, Andrieu 1984, Monnet 2011a). Thus we need to explain why similar policies and institutions led to the stagnation of investment in the early 1950s and to growth in the late 1950s. Was the early 1950s drop in investment necessary to reallocate factors or was it suboptimal? Did investment suffer more than consumption and GDP from the 1948-1949 restrictive monetary policy and then did not recover when the second episode of restrictive policy started in October 1951? Was it an adverse effect of the Marshall plan (banks were reluctant to finance nationalized firms which already received Marshall loans)? These are hypotheses for further research. The results in this paper have nonetheless shown that the inefficiency of state intervention in the banking sector cannot be taken for granted.

What happened to the French economy and the banking sector after 1974 is also subject to many discussions and interpretations. Our database ends just before the ratio investment/GDP started a continuous fall in the late 1970s. My computations of MPKs have shown that there is neither an important decrease in average nor a rapid convergence over the period. But it appears that the average MPK in 1974 is the lowest of the sample. These patterns were already observed in a study by INSEE (Benard 1974) that focused on 9 branches. It tends to be a robust feature of the French postwar economy. Is the stability of MPKs over almost 15 years a sign that the allocation of capital was not so efficient? Did the state intervention in the allocation of credit worsen once the average MPK started to decrease in the early 1970s? An answer to these questions requires a comparative perspective on growth in several European countries.

8 Conclusion

The results and interpretations of this paper highlight an important factor of French growth between 1954 and 1974 that have been previously neglected in the economic literature on the European Golden Age: new institutions that favored the development and the efficient allocation of medium and long-term credit. Because of the many financial controls on interest rates and the preferential regimes, the role of prices was minored in

the allocation of credit. Though, the allocation of funds turns out to be consistent with neoclassical predictions. I have particularly shed light on the role of the central bank through its discount window, its network of branches, credit controls and its statistical services. The importance of the financial factor is complementary to previous studies on postwar European growth, especially those which focused on the catch-up process due to the destruction of capital (Vonyo 2008), on the reallocation of factors (Temin 2002) and on the new institutions that favored a coordinated capitalism (Eichengreen 2007). It might be argued that the reasons why state intervention had been successful and did not create major misallocations of capital were partly due to the fact that the economy was reconstructing and in a catch-up process. The catch-up process favored investment's choices: it was easier to know on which sectors credit policy had to focus. This development process is apparently very similar to the one described in the model of Acemoglu, Aghion and Zilibotti (2006): countries in a catch-up process pursue an investment-based strategy, which relies on existing firms and managers to maximize investment but sacrifices selection. Nevertheless, I have also shown that state intervention worked beyond supporting incumbent firms and copying other countries' strategies. The French state also favored restructuring in some industries and factor reallocations. Most of all, an important part of state intervention consisted in rediscounting loans and providing information to banks. The state did not necessarily intervene as a substitute to the banking sector; it supported actively the development of banking credit.

A lot of work remains to be done, notably on the potential misallocations that may have prevented growth to be even higher, on the respective role of the specialized credit institutions and their resources, on the impact of credit to exports on trade, as well as on the rents that arose in the 1970s.

The results on short-term credit also require further investigation. On one hand, the conclusion that the development of short-term loans did not affect positively growth is consistent with the empirical corporate finance literature on net sources of investment (Mayer 1988, Corbet and Jenkinson 1996, Cobham and Serre 2002) that finds that the net contribution of short-term loans - and especially trade credit - to investment is negative. On the other hand, this result might reveal that short-term loans financed inefficient firms that did not have access to longer maturity.

This paper hopes to have provided a first step and an original database to think about these issues.

The fact that financial repression might be associated with financial deepening and growth and that state intervention in credit allocation might be motivated by the development of the banking sector rather than seigniorage is not restricted to French history. But up to now both the cross-countries literature on finance and growth (King and Levine 1993, Levine et al. 2000) and the literature on credit cycles and booms (Rancière et al. 2008, Bordo and Haubrich 2010, Schularick and Taylor 2011) have not considered the role of credit policies (by both governments and central banks) for financial deepening and the evolution of credit. In their seminal paper, Levine et al. (2000) pointed out that over the period 1960-1995, the correlation between credit to GDP and growth was mainly driven by many well-known “Asian Miracles”, such as Malaysia, Japan, Taiwan, and South Korea. These countries are also all well known for the high degree of state intervention in their banking and industrial sector (Wade 1994, Rodrik 1994, Calomiris and Himmelberg 1995, Cho and Vittas 1995). The “East Asian miracle” and the “European Golden Age” present many similarities. On the other hand, credit policies have failed in many other developing countries and financial repression remains a persuasive explanation of poor economic performances (McKinnon 1993, Demetriades and Luintel 1996). But since the World Bank 1993 report on East Asia and the controversies that followed (Rodrik 1994, Vittas and Cho 1995), few studies have attempted to measure quantitatively the effects of credit policies on the allocation of funds and financial development. An exception is Demetriades and Luintel (2001) on South Korea but they use only a credit aggregate and do not study the allocation of loans.

The history of credit policies and their consequences in Europe and Asia since WWII remains to be done. It would certainly shed light on both cross-countries variations and the nature of credit cycles. Excess credit, debt overhang and stagflation may be to a *dirigiste* financial system what an asset boom and a financial crisis are to a free-market system; the other side of the coin of financial deepening.

But, after all, the story in this paper will probably seem very familiar to the readers of Alexander Gerschenkron (1952). Studying particularly the industrialization policies of Germany and Russia in the XIXth century, he showed how catch-up growth had been sustained by institutional arrangements that built close links between the state and the banking system. These arrangements showed considerable differences across countries, they grew in a intellectual climate - or ideology - that favored industrialization in a national context and had no counterparts in the more advanced economies. Western

European growth during the postwar Golden Age was surely very different from the XIXth century catch-up process, but the French example combines characteristics that are persuasively reminiscent of Gerschenkron's argument. Banking and finance, industrial policies and a peculiar "nationalist" spirit that enhanced the need for credit and state intervention were crucial elements of French post WWII growth. Even though state intervention was prevalent in all European countries at that time³¹, national economic and political characteristics differed in important ways, and nonetheless achieved similar successes. As Gerschenkron himself concluded, the observation of such historical patterns may "help in replacing the absolute notions of what is 'right' and what is 'wrong' by a more flexible and relativistic approach."(p.27)

9 APPENDIX 1: Cereals

³¹Monnet (2012) attempts to review central bank interventions in credit market in six European countries from 1950 to 1975.

BANQUE DE FRANCE

Secrétariat Général

Financement du stockage
des graines oléagineuses
métropolitaines
Campagne 1959-1960

CIRCULAIRE n° 8892
du 21 juillet 1959

Section 55 A

L'arrêté du 29 juin 1959, publié au Journal Officiel du 3 juillet 1959, a fixé les prix des graines oléagineuses métropolitaines de la campagne 1959.

La Banque a décidé d'apporter son concours au financement du stockage de ces graines dans les conditions suivantes :

BENEFICIAIRES

Sont susceptibles de bénéficier de crédits mobilisables à l'Institut d'Emission, les négociants et les coopératives agricoles agréés par le Ministre de l'Agriculture comme organismes stockeurs de graines oléagineuses.

FORME DES CREDITS

Les crédits devront être réalisés sous l'une des formes suivantes :

- Warrants commerciaux,
- Warrants agricoles (pour les Coopératives seulement),
- Billets,
- Effets d'acceptation (pour les cédants directs).

Les effets et les billets devront être causés par référence au tonnage et à la nature des graines faisant l'objet du financement.

BASE DE NOTRE CONCOURS

La Banque a décidé de limiter son concours aux montants précisés ci-dessous :

1°) pour les graines oléagineuses métropolitaines suivantes :

- Colza et navette ..	.....	F 5.300	par quintal
- Tournesol .....	.....	F 3.600	" "
- Carthame .....	.....	F 2.300	" "
- Soya .....	.....	F 3.400	" "
- Lin .....	.....	F 5.300	" "
- Moutarde noire ayant fait l'objet de contrat .....	.....	F 6.000	" "

...

2°) pour les autres graines oléagineuses métropolitaines et les graines de moutarde noire n'ayant pas fait l'objet de contrat :

- 50 % de la valeur des graines.

Le montant de nos accords ne saurait dépasser le chiffre obtenu en multipliant le taux d'intervention correspondant à la nature des graines stockées, par la capacité de stockage déclarée par les intéressés lors de leur agrément.

Bien entendu, notre concours reste subordonné à la situation financière ainsi qu'à la justification des besoins réels des organismes stockeurs, et ne devra jamais prendre un caractère d'automatisme.

Vous pourrez apprécier de façon libérale la surface des bénéficiaires des crédits, mais vous veillerez à ce que la troisième signature et, pour les crédits directs, celle du principal obligé, couvrent largement les risques envisagés.

D'autre part, nous vous signalons que la Banque a de nouveau décidé, pour la présente campagne, de considérer l'aval de la SOCIÉTÉ INTERPROFESSIONNELLE DES OLEAGINEUX FLUIDES ALIMENTAIRES "S.I.O.F.A." comme une signature statutaire.

Les demandes de mobilisation dont vous serez saisis pourront donc comporter l'aval de la S.I.O.F.A. en troisième signature.

Il vous appartiendra, le cas échéant, de vous assurer que le stockeur bénéficiaire a effectivement versé au fonds de caution mutuelle géré par cet organisme une somme égale à 7,50 % du montant de l'aval sollicité.

DUREE DE NOTRE CONCOURS

Le terme de la campagne est fixé au 30 juin 1960; la validité de nos accords devra être limitée, au plus tard, à cette date.

TRANSMISSION DES DEMANDES

Les demandes seront transmises, dans les conditions habituelles, à la Direction Générale de l'Escompte - Direction de l'Escompte-Province -, et devront comporter, outre les renseignements d'usage, l'indication de la capacité de stockage déclarée par les intéressés lors de leur agrément.

LE DIRECTEUR GENERAL
DE L'ESCOMPTE,

L. VUATINE

LE SECRÉTAIRE GENERAL,

F. GARGAM

Figure 8: Source: ABF, 1331200301/10.

10 APPENDIX 2: Shares of lending institutions

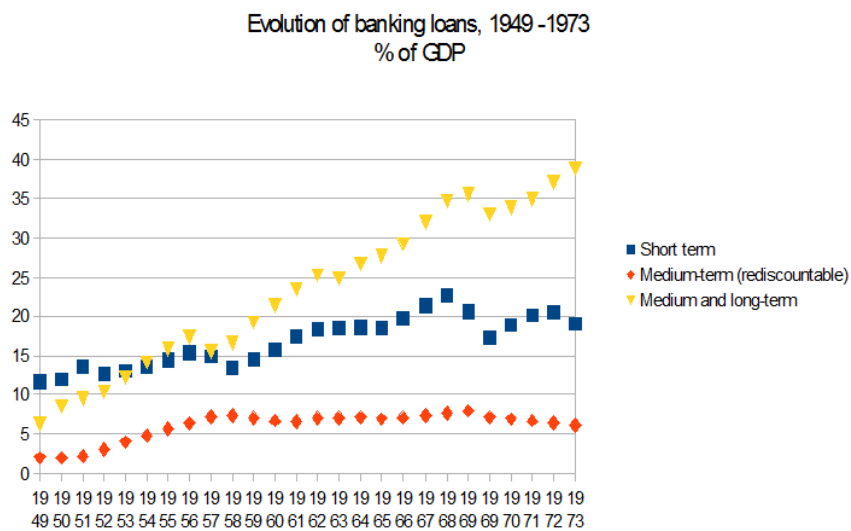


Figure 9: Sources: CNC, quarterly data

Evolution of loans maturities
France, 1945-1974
% of the total of loans.

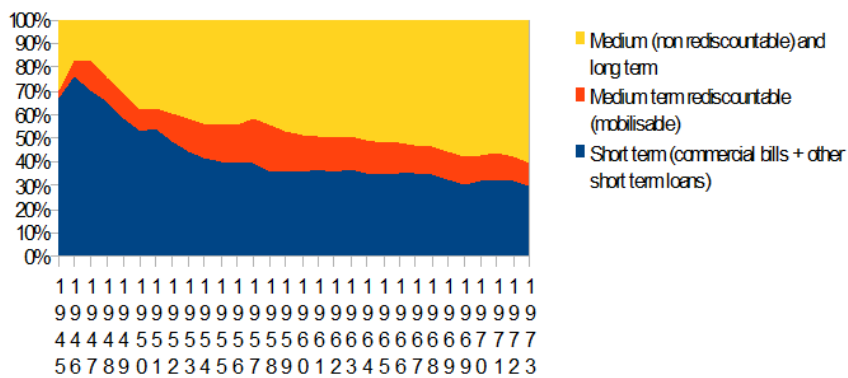


Figure 10: Sources: CNC, quarterly data.

Shares of lending institutions. Short-term credit.

% of total loans. 1945-1974.

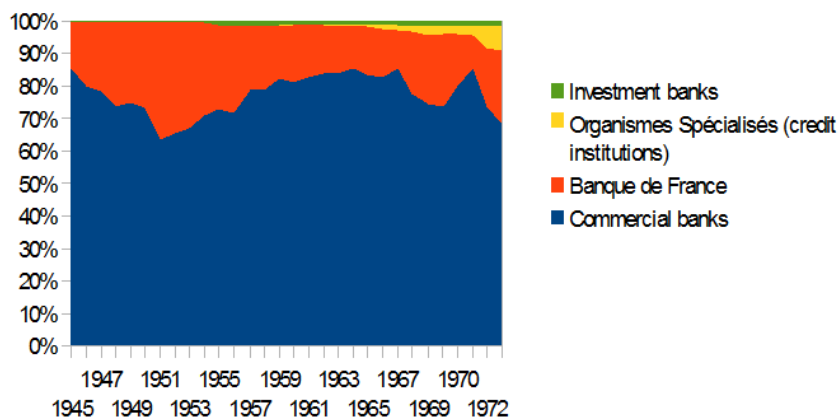


Figure 11: Sources: CNC, quarterly data.

Shares of lending institutions. Medium-term credit (rediscountable)

% of total loans. 1945-1974

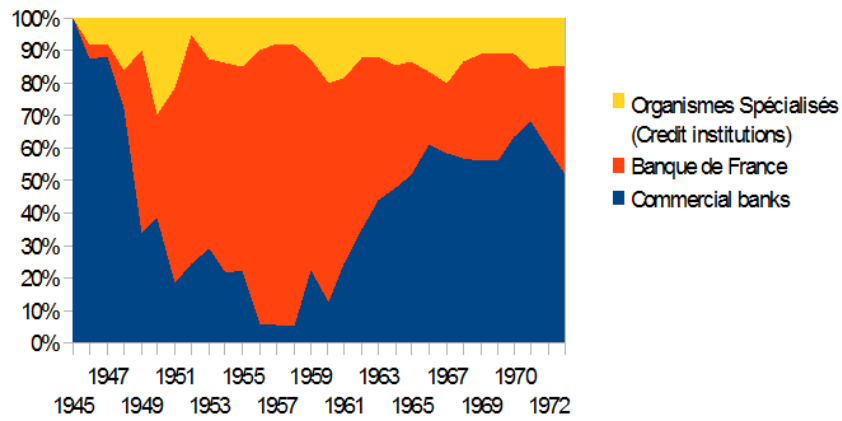


Figure 12: Sources: CNC, quarterly data.

Shares of lending institutions. Medium and long term credit.

% of total loans. 1945-1974

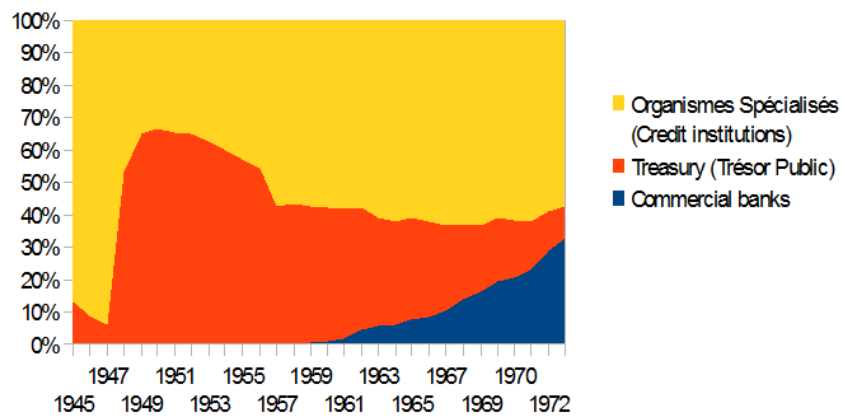


Figure 13: Sources: CNC, quarterly data.

11 APPENDIX 3: Sectoral characteristics and evolution of loans maturity

Secteurs (french name)	Sectors	Turnover	Investment	Investment credit	Short-term credit	Number of firms
aeronautique	aeronautics	5 773,67	3 251,29	1 642,27	623,06	206
agriculture	agriculture	7 946,99	2 396,00	1 162,73	2 410,12	320
assurances	insurance	14 200,00	4 324,27	91,51	54,30	3 055
automobile	automotive	32 100,00	12 300,00	5 203,64	1 341,57	40 303
batiment	construction	48 300,00	8 143,18	5 889,76	766,84	208 294
boulangerie	bakery	6 752,12	1 490,66	389,85	125,57	50 291
caoutchouc	rubber	5 835,95	3 338,53	2 112,51	322,96	1 402
chaussures	shoes	3 382,14	827,20	1 135,78	44,14	24 846
chimie	chemicals	21 600,00	15 100,00	6 155,08	1 861,98	2 300
combustible	fuel	4 667,90	11 700,00	1 000,59	1 499,52	111
commerce du charbon	coal (trade)	5 669,57	773,31	1 674,04	54,64	5 196
commerce de fruits	fruits (trade)	6 993,61	375,67	417,94	79,30	8 103
commerce de métaux	metal (trade)	8 330,49	526,96	4 167,22	87,82	683
commerce textile	textile (trade)	21 900,00	2 889,23	3 690,27	210,72	74 818
commerce de viande	meat (trade)	14 700,00	889,86	413,60	32,53	60 392
construction électrique	electricity (construction)	22 700,00	7 563,11	7 310,93	1 223,47	8 806
conserverie	canning industry	5 567,54	1 338,51	1 714,51	153,20	1 748
cuir	leather	2 464,66	592,52	1 103,91	40,11	10 071
électricité	electricity (supply)	9 699,59	42 800,00	227,77	7 141,55	259
élevage	livestock	302,39	85,08	385,50	301,39	918
fer	iron (mining)	564,87	1 524,81	70,70	49,25	62
fonderie	foundry	16 300,00	6 316,67	5 414,09	776,03	6 701
forêts	forest	972,04	295,51	365,05	34,24	4 767
gaz	gas (supply)	2 641,09	5 805,80	134,56	764,58	27
horlogerie	watchmaking	7 569,61	4 010,01	1 571,30	369,50	12 367
hotellerie	hotel business	7 204,01	4 050,51	179,08	743,35	133 151
mecanique	engineering	8 189,99	2 970,75	1 718,73	365,04	49 455
metalurgie générale	metallurgy	3 905,75	3 690,20	1 568,02	557,74	46
transformation des métaux	metal transformation	3 672,14	2 409,76	833,07	367,69	134
mines	mining	2 153,01	1 998,33	676,44	165,79	4 361
construction navale	shipbuilding	2 935,52	1 385,69	876,72	637,83	1 058
papier	paper	9 052,23	7 162,79	4 170,87	502,62	2 163
peche	fishing	561,01	578,06	117,41	112,99	2 817
petrole	oil	17 200,00	4 997,04	2 646,39	888,12	25
presse	media	12 400,00	4 140,72	1 931,67	250,35	17 500
sante	health	8 421,38	3 292,81	267,53	1 015,65	19 659
scieries	sawmill	2 203,08	448,22	724,15	33,97	10 638
siderurgie	siderurgy	13 100,00	14 700,00	2 685,48	2 863,40	53
stockage	storage	396,70	55,02	3 147,97	364,88	105
sucres et boissons	sweets and drinks	10 400,00	6 083,58	3 394,86	698,06	6 613
sucreries	sugar production	3 785,79	1 866,26	1 125,22	172,21	121
tabac	tobacco	6 531,57	711,21	20,23	86,73	137 876
textile	textile	17 400,00	8 795,47	6 229,21	505,21	7 188
transport des métaux	metal (transportation)	7 931,08	3 619,00	2 936,52	416,08	557
transport maritime	shipping	3 667,25	7 610,92	160,15	1 107,84	308
transport routier	road transport	10 200,00	8 734,77	1 195,93	552,86	46 789
transport ferroviaire	railroad	11 100,00	23 100,00	353,42	1 961,03	1 372
travaux publics	publicwork	14 700,00	7 566,46	3 144,19	2 007,61	4 424
verre	glass	2 828,33	1 529,01	923,34	242,83	1 440

Table 10: Names of the sectors and average values of the main variables, 1954-1974

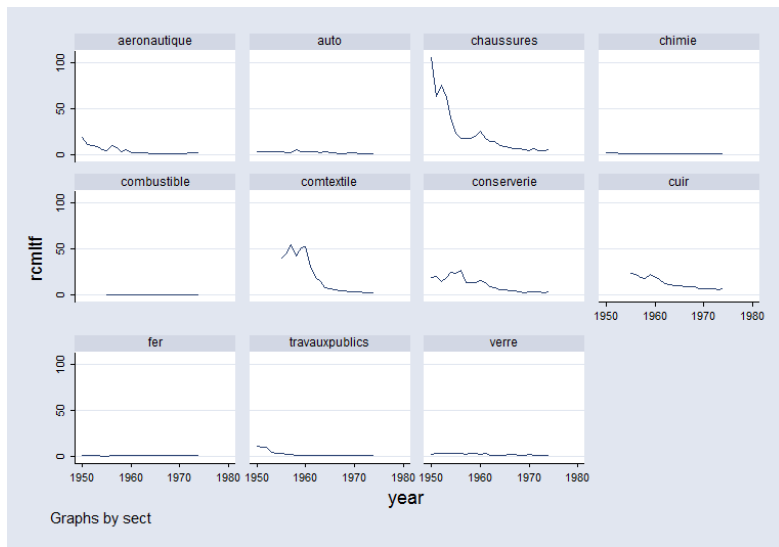


Figure 14: Evolution of sectoral ratios: 'short-term credit' / 'mid-long term credit'.

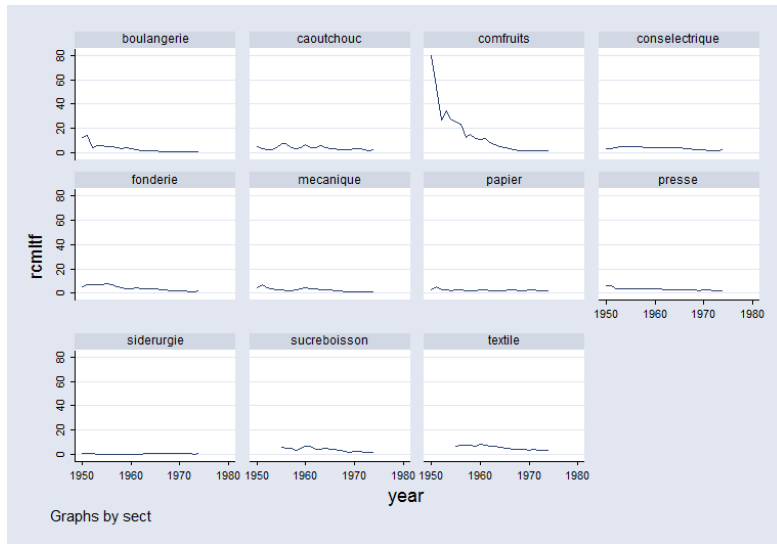


Figure 15: Evolution of sectoral ratios: 'short-term credit' / 'mid-long term credit'.

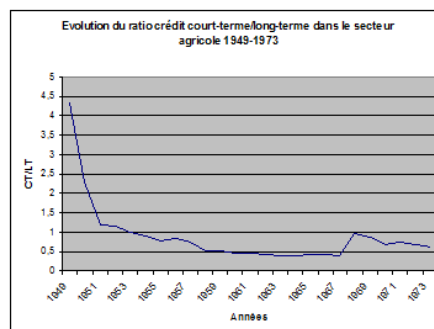


Figure 16: Evolution of the ratio 'short-term credit' / 'mid-long term credit' in agriculture.

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