**Institutional Shocks and Competition in Portuguese Commercial Banking in the Long Run (1960-2015)**

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**Abstract:** The Portuguese economy passed through two massive institutional shocks in the period from 1960 to 2015: in 1975, with one of the largest nationalisation programmes ever in the Western world; and in the late-1980s, with one of the largest privatisation programmes ever in the world. We assess how these shocks affected competition in commercial banking through statistical tests of the Panzar-Rosse type. Interesting conclusions result, namely that the nationalisation period did not imply a reduction in competition and that the privatisation period might have meant a reduction in competition. We provide a few hypotheses to understand these counterintuitive results.

**Introduction**

The Portuguese economy was affected by two radical institutional shocks in the period ranging from 1960 until the early twenty-first century. The first shock took place in 1975, when a massive nationalisation programme led to one of the largest transfers of private property into public hands in Western Europe. The second occurred in the early 1990s, with a shift of a totally opposite sign, thanks to one of the largest privatisation programmes ever. These shocks made the economy pass through three different periods of strongly contrasting regulatory frameworks: from 1960 to 1975, from 1975 to the early 1990s, and from the early 1990s to 2015. In each period the issue of competition was dealt with in a completely different manner. In the first period, the purpose of regulation in the various markets was to restrict competition heavily; in the second, such a purpose was even clearer, as a large part of the economy was in the hands of the State, with various public monopolies being created; in the third, there was a radical change in the spirit of regulation, now informed by liberalising and pro-competition principles.

The banking market was directly affected by these changes. What we do in this paper is to assess the impact on competition in commercial banking of the mentioned three different institutional settings. In order to do so we use a statistical test developed by James Rosse and John Panzar (Rosse and Panzar, 1977, and Panzar and Rosse, 1987), allowing to measure and classify competition. We would expect competition to be very limited in the first period, verging on non-existent; we would also expect competition to virtually disappear in the second, as all commercial banks became State-owned, and to re-emerge strongly in the third, with privatisation and a nominally competition-friendly new environment. However, as we will see below, that is not what happened. Not anticipating much, our Panzar-Rosse tests show strong competition in the commercial banking market in the first period, weaker competition in the second and even weaker in the third, pointing to the appearance of a collusive oligopoly. These counterintuitive results need an explanation, which we can only partially provide here. An agenda for future research will have to look into each of these periods in detail in order to find a rationale for the different behaviours of the market.

The issue of competition has been at the centre of contemporary economic and business history. A trend toward concentration and oligopoly in the twentieth century has been famously identified by Alfred Chandler (1977 and 1990), following Ronald Coase’s (1937) and Oliver Williamson’s (1975 and 1981) lead. However, the analysis of this trend has been applied mostly to large developed economies, such as the US, the UK or Germany. This paper should be understood as a contribution to expand it to small and relatively less developed economies.

Banking is a special sector which has been subject to strong legislative interventions, most of them with the issue of competition in mind. Most western governments tried to limit banking competition by introducing fiercely anti-competitive legislation in a large part of the twentieth century (at least from the 1920s to the 1970s); most inverted stance from the 1980s onwards and adopted liberalising measures (AAVV, 1994, and Cassis *et al.*, 1995). The effectiveness of these various waves of legislation has, however, been questioned by many authors, who have showed that, in the period when countries adopted the strongest legal restrictions, their banking markets displayed signs of competition that were similar to those existing in later periods, when liberalisation was the norm (Bordo *et al.*, 1994, Battilossi, 2000, Capie and Billings, 2004, Pons, 2002, Pueyo, 2003, or Amaral, 2013 and 2015a). Other authors have shown that the liberalisation process after the 1980s brought increasing concentration in banking markets, especially during the 1990s and the early twenty-first century, but also that such a process was not necessarily synonym with less competition: whilst the evidence on concentration does not pose doubts, the evidence on competition is ambiguous, increasing in some countries while decreasing in others (Bandt and Davies, 2000, Bikker and Haaf, 2002, Bikker *et al.*, 2007, Beck, 2008, OECD, 2010 and 2011, Anginer *et al.*, 2012, and Bikker *et al*., 2012).

We use Portugal as an example of a small and relatively less developed economy, and start by assessing if its commercial banking market followed the trend of increasing concentration typical of large and rich economies in the twentieth century; then we assess if competition was affected by that trend. Most studies on the issue of competition in Portugal, in general (Alexandre and Bação, 2012, Amador and Soares, 2013) and in the banking market in particular (Barros and Modesto, 1997, Pinho, 2000, Canhoto, 2004, or Boucinha and Ribeiro, 2009), have focused on recent periods, mostly from the 1990s onward. An indirect and broad analysis for the whole economy in the long-run has been tried by Silva and Neves (2014), through the study of interlocking directorates. Amaral (2013 and 2015a) has contributed with two pieces on the banking market in the 1950-1973 period. The current paper is, thus, the first one measuring competition directly in the long run for a specific sector of the economy.

The radical institutional shifts that rocked the economy make the Portuguese case a particularly interesting one. The country can almost be seen as a laboratory case of the effect of the main political ideas of the twentieth and twenty-first centuries on the functioning of the economy: the 1960-1974 period corresponded to the last fourteen years of a long lasting authoritarian regime (coming from 1933) which was very suspicious of free markets and competition and regulated the economy accordingly; 1974 was the year of a coup d’état that overthrew the authoritarian regime and initiated a revolutionary process of communist or socialist tendencies, eventually leading to the nationalisation of large swathes of the economy in 1975, including the entire commercial banking sector; this lasted until the late-1980s and early-1990s, when a liberalising wave swept the country and reverted virtually all previous nationalisations and the country entered into an institutional environment that should have been more favourable to competition.

The purpose of this paper is to assess how competition in the commercial banking sector evolved throughout these drastic changes. In order to do it we go beyond the simple description of legislative measures as well as simple measures of concentration of the market, which are sometimes assumed as being equivalent to competition. Instead we implement a series of tests of the Panzar-Rosse type which measure directly competition using banks’ balance sheets as data sources. These tests allow to classify competition into three categories: perfect competition, monopolistic competition (a form of oligopoly the outcome of which is similar to perfect competition in the long-run, although not in the short-run) and a perfectly collusive oligopoly.

As already hinted above, the results in this paper are sometimes surprising. According to some of them, there are signs of perfect competition in the 1960-1975 period, despite the heavily restrictive institutional setting, and signs of a colluding oligopoly after the 1980s, despite the increasingly liberalising framework. The tests suggest furthermore that commercial banking presented stronger competitive signs during the period of integral State-ownership between 1975 and the mid-1980s than afterwards, when banks were privatised and the legislative setting had the explicit objective of promoting competition. This raises the issue of the differentiation between the purpose of the law and the actual behaviour of the agents in the market

We should start by establishing the relevance of the object of our paper. In such a long period and with such drastic swings in institutional environment it is only natural that commercial banking has not retained a constant quantitative importance in the financial sector. Figure 1 shows the share of assets in commercial banks as a proportion of all financial assets in the Portuguese economy between 1960 and 2006.[[1]](#endnote-1) The figures are worth a few comments. The first comment is that we are talking of a branch that was consistently the largest within the financial sector, something that should be enough to stress the relevance of our study. The second is that we can identify essentially three periods in what respects that importance. The first went from 1960 to 1975, during which the asset share of commercial banks ranged between 80% and 90% of all the financial sector. The second period went from 1975 to the 1980s, when the asset share of commercial banks declined consistently to 65% until 1986 and then stabilised, until the early 1990s. As Figure 1 shows this decline occurred mostly to the benefit of savings banks, a section of the market overwhelmingly dominated by Caixa Geral de Depósitos (CGD), the State-owned savings bank and the only savings bank of relevant dimension. In a final period there was a massive recovery of the importance of commercial banks, reaching unprecedented levels – around more than 90% of financial assets. A large part of this was, however, the result of the institutional reclassification of CGD, which lost its nature of a savings bank in 1993 to assume that of a universal bank, as we will see below. In fact, in this last period the differentiation between commercial and savings banks became increasingly less relevant as most banks acquired the nature of universal banks, a principle introduced through the norms of the European Union.

The remainder of the paper goes as follows:

In Section 1 we present the legislative framework of each of the periods studied and also the evolution of the market in terms of the number of banks and degree of concentration. In Section 2 we present the statistical model used. In Section 3 we present the sources of our data, which are basically the banks’ annual reports from 1960 to 2015. In Section 4 we show the results of the tests and in Section 5 we discuss them, taking into consideration their relevance for the issue of competition in the Portuguese economy.

1. **Regulation and concentration**

Next we describe the main legislative features of each of the sub-periods studied and present the basic figures concerning the number of banks in the market and its degree of concentration.

**1a) 1960-1975**

The legislative framework of Portuguese banking in the period 1960-1975 was based on Decree-Law 42,641, of 12 November 1959. Similarly to the situation existing in most other countries, the Portuguese legal framework included: a) the principle of discretionary governmental authorisation for the opening of banks and branches, and for mergers and acquisitions, to which was added an implicit freezing on the number of banks, something that prevented the appearance of new entrants (except in very special circumstances), b) high capital requirements, c) high liquidity requirements, d) the establishment of interest rates by decree, and e) some form of separation between the investment and commercial activities of banks, i.e. the refusal of the “universal bank” model, which Portuguese authorities believed had been at the origin of most of the banking crises from the second half of the nineteenth century until the 1920s (Reis, 1995). Portuguese legislation did not impose a formal separation between investment and commercial banking, but severely limited the ability of commercial banks to engage in long-term ventures. The main elements of this legal framework are summarized in Table I (further discussion can be found in Amaral, 2013 and 2015a).

According to this institutional setting, banks had very limited freedom of action: quite restrained in their interest rate policy and forced to hold high cash reserves, they could not lend in the long run and could apply only a very limited portion of their resources in stocks or bonds. Also, if they wished to expand geographically by opening branches, the Government’s authorisation was needed. We must note that the market possessed some contestability: mergers, acquisitions, and entries depended on governmental authorisation but were not forbidden. Thus, despite not being free, contestability existed, and the threat of exclusion, although not entirely determined by the market, was present. Amaral (2013) has also shown that, despite being forced by law to lend only short-term, commercial banks had adopted the practice of renewing several times these loans, so that ultimately they functioned as long-term credit to the economy. The fact is that the number of banks declined considerably between 1960 and 1975, always through some form of merger or acquisition or through the transformation of unincorporated banking houses into incorporated banks.

In 1960, at the beginning of this period, the Portuguese banking system comprised 24 incorporated commercial banks, 11 non-incorporated banking houses, and 20 savings banks, plus a few less important institutions (INEb, 1960-1976). Incorporated commercial banks dominated the market, accounting for roughly 69% of all deposits (up from 40% in 1938). Non-incorporated banks were residual, with a market share of about 1.5% (INEa, 1960-1974). Most of the 20 savings banks were small, with the exception of CGD, which represented 90% of all deposits in savings banks and was the largest financial institution in the country, with a market share of around 27%.

The value of the Hirschman-Herfindahl Index (HHI) for deposits in Portuguese commercial banks in 1960 (which excludes CGD) was 0.15 (Figure 2), a moderate to high figure in comparative terms, if we use the US Department of Justice and Federal Trade Commission’s standards (US Department of Justice and Federal Trade Commission, 1982, and 2010). Concentration ratios are presented in Figure 3 (measuring the proportion of deposits appropriated by, respectively, the three and five largest commercial banks in Portugal): the three largest banks appropriated 55% of deposits and the five largest about 70%, again a moderate to high figure, as shown by the international comparisons presented in Amaral (2013). In terms of assets, the picture was similar, both for the HHI and the concentration ratios (Figures 2 and 3).

Fourteen years later, in 1973, the banking structure had changed considerably. Commercial banks now held 80% of all deposits in the country, with the remaining 20% being held almost entirely by CGD. The number of incorporated banks had dropped to 16 (Valério, org., 2010), the number of non-incorporated banks to 4 (INEa, 1960-1974) and among the savings banks only CGD had some relevance. None of these movements in the market resulted from bankruptcies, but rather of the transformation of non-incorporated banks into incorporated ones and of mergers and acquisitions.

The changes outlined above were reflected in a degree of concentration that fell between 1960 and 1973, as measured by both the HHI and the concentration ratios (Figures 2 and 3). The HHI for deposits went from around 0.15 in 1960 to around 0.10 in 1973, a low level of concentration. And the one for assets displayed a similar behaviour, from 0.14 to 0.09. As for the concentration ratios, the decline was especially pronounced in the CR3 indicator in both deposits (from around 55% to around 43%) and assets (55% to 35%), but is visible also in CR5. As a first impression, this is not a picture of stability, contrary to what the nature of the legislation would have implied.

Although often used, mostly in the Structure-Conduct-Performance type of analysis, measures of market concentration (such as the Herfindhal Indices and concentration ratios above) pose problems of interpretation when taken as a proxy for competitive behaviour. They cannot be interpreted in themselves as confirmation of the existence or of the lack of competition. Still, they are a preliminary indicator to take into account, and the behaviour of the measures presented above does raise some questions regarding the idea of the non-competitive environment Portuguese banks faced in this period. We will test these ideas below by measuring competition in a formal way.

**1b) 1975-1989**

The institutional environment of the previous period was radically altered in 1975, when the commercial banking sector (together with a large number of other sectors of the Portuguese economy: money emission, insurance, basic metals, naval construction and repair, cement, paper and paper pulp, chemicals and petrochemicals) was nationalised. In 1974 a military coup d’État overthrew the previous authoritarian regime and sent the country into a path of socialist- or communist-oriented policies. The consequence was the nationalisation of a significant section of the economy, generally covering the property of the large business groups that had grown in dimension during the authoritarian regime and/or the sectors that the revolutionary authorities considered to be “strategic” (Baklanoff, 1996). Commercial banking was inevitably included, as it qualified on both dimensions: it was a “strategic sector” and many banks were part of business groups. Decree-Law 132-A/75 of 14 March 1975 nationalised all commercial banks, with the exception of the three foreign ones then operating in the country and of savings banks – the latter being a small part of the sector, except for CGD, which was already owned by the State anyway (Table I).

On 22 December 1975, Decree-Law 729-F/75 transformed the nationalised banks into State-owned enterprises (Table I), which acquired a particular legal status in 1976, defined by Decree-Law 260/76 of 8 April. This piece of legislation granted State-owned companies administrative, financial and asset autonomy, although under general guidance by the Government, to be exerted through a specific ministry. The minister had to approve the plan of activities of the company, its budget, the prices to be set for its goods and services, as well as some forms of debt to be issued, and other minor items. On 2 April 1976 a new Constitution was approved which made nationalisations irreversible (“irreversible conquests of the working classes”, in its exact wording) (Table I).

Despite a government control that was stronger than in the 1960-1975 period, the number of operations open to banks was enlarged: they were authorised to open foreign currency accounts, as long as they belonged to Portuguese emigrants (in 1975), to open accounts of non-residents, although only for time deposits (in 1977), and to give medium- to long-run credit (in 1977) (Table I). All interest rates used by banks, rather than established by decree as in 1960-1975, were set by the Bank of Portugal (BoP) (Decree 644/75 of 15 November 1975), which meanwhile had also been nationalised in 1974 (Decree-Law 452/74, of 13 September). The BoP was also given the power to set the ratio of commercial banks’ currency reserves (thanks to the same decree).

From 1976 onward the political regime started moving from its initial communist leanings into a more moderate direction: the mixed economies of Western Europe were now the reference for reform (Baklanoff, 1996) – these were economies essentially based on market forces but with a strong presence of the State in many aspects of their functioning. This was seen in a series of legislative changes, all of them with consequences for commercial banking. One such change was the approval by the parliament of Law 46/77 of 8 July 1977, drawing a limit between the “private” and the “public” sectors of the economy. Although the law basically ratified the limits imposed by the Constitution, it was actually an instrument against further expansion of the “public” sector. Banking was included in the “public” sector, meaning that the irreversibility rule still applied to it. But the law opened the door to the creation of private financial institutions, as long as they did not adopt the form of commercial banks. In 1977 the Portuguese Government asked to join the European Economic Community (EEC), something that did not have immediate practical consequences but would have in the future. At the time it mostly showed that the new regime was determined to put the communist tendencies behind its back.

Between 1979 and 1980 a series of non-banking financial institutions appeared, in order to profit from the openings of Law 46/77: leasing companies, which could issue bonds and ask for loans in both Portuguese and foreign financial institutions (in 1979); investment companies, which could grant long-run credit having as resources their own capital, bonds, banking credit and foreign currency deposits (in 1979); and Regional Development Societies, whose object was the funding of investment projects at the regional level and whose resources were bonds, loans and deposits from emigrants and regional authorities (in 1980) (Table I). Since commercial banking was closed to private ownership it was in these institutions that most private capital concentrated.

On 16 August 1983, Law 11/83 authorized the Government to revise the limits between the public and the private sectors as established in 1977, and on 19 November of the same year Decree-Law 406/83 opened commercial banking to private property (including foreign banks). This did not mean that the banks that had been nationalised could now be privatised – these were still under the irreversibility constitutional norm. But it meant that new private banks could open. Decree-Law 51/84 of 11 February 1984 regulated the new institutions. New private banks had to be incorporated and have a minimum capital of 1,5 billion escudos and its opening was dependent on authorisation by the Government – the same happened with mergers and acquisitions and the opening of branches (Table I). New kinds of financial institutions were also authorised: investment funds (for stock and bonds and for real estate) (in 1985), factoring companies (in 1986), venture capital companies (in 1986) and credit companies (i.e. companies for consumption credit) (in 1989) (Table I).

In what concerns the variables relevant for competition, we can say that between 1975 and 1984 entries in the commercial banking sector were forbidden (they could only happen if the Government decided to create a new bank, but there were no market pressures to enter or exit). Contestability, hence, did not exist. This was tempered by basically two facts. First, commercial banks had some management autonomy, according to the State-owned enterprises statute, as we have seen above, meaning that they were not the mere executioners of the Government’s will. Also, they were given the right to develop more operations than during the previous period, some of them with possible consequences for competition: attracting emigrants’ remittances or time-deposits of foreign currency, or finding medium- to long-run projects to finance. Finally, the non-banking financial institutions competed to a certain extent with banks. The competition between these institutions and commercial banks was, of course, limited, as the objects and resources of the two types of institutions coincided only in some dimensions.

But between 1984 and 1989 the situation of the market changed, with the opening of the sector to private activity. New banks could now enter the market, although subject to the rules mentioned above (high capital requirements and authorisation by the Government). From 1975 to 1984 mergers and acquisitions had had a strictly administrative existence, as only the Government could decide on them. From 1984 to 1989, they could happen in the private part of the market thanks partly to market forces, although still dependent on Government authorisation – the same was true of the opening of branches. As for interest rates and liquidity ratios, they were dependent of BoP decisions. The competitive environment of the market was, thus, significantly altered after 1984.

The population of commercial banks had important changes during this period. In 1974 the market was constituted by 16 commercial banks, which appropriated 80% of deposits. Virtually all the rest was appropriated by CGD, with a share of 18%. Between 1975 and 1976 all non-incorporated banks disappeared. Between 1976 and 1978 the government (now the sole owner of commercial banks) promoted the merging of various banks thus reducing their number to nine (Martins and Rosa, 1977, and Valério, org., 2010). This was the situation prevailing until 1984, at the time of the opening of the sector to private activity. Then, new banks appeared: five national ones and six foreign ones between 1984 and 1988. Between 1981 and 1984, six investment societies and seven leasing companies were also created (Valério, org., 2010).

By 1989, the number of Portuguese banks had jumped back to 14, more or less the same as in 1974. Adding the foreign ones, however, the number passed to 23, more or less the same as in 1960. The changes from 1975 to 1989 are reflected in the HHI and concentration ratios presented in Figures 2 and 3. Both indicators increased after nationalisation and the mergers promoted by the Government during the 1970s: HHI for deposits grew from around 0.10 back to around 0.13 in 1984 (a value similar to that of the 1960s), and for assets from around 0.09 to around 0.13. The share of the three largest banks in terms of deposits grew from around 40% to around 50% in the same period, and for the five largest from around 60% to around 67%. In terms of assets the picture is similar. There was some fluctuation of all indicators between 1975 and the mid-1980s, showing that not all was calm in the world of nationalised banking. But from the mid-1980s to the early-1990s there was a strong decline, accompanying the appearance of the new banks. The HHI for both deposits and assets fell from around 0.13 to around 0.09 – never much below the 1973 level. The share of the three largest banks (both in terms of deposits and assets) fell from around 50% to around 40%, and the share of the five largest banks (again on both dimensions) from around 65% to around 55%.

The reasons behind the market movements in this period remain much unclear due to lack of research: what were the principles behind the reorganisations of the 1970s – why some banks were closed, some received the assets of closing banks (and not others)? These are the questions that must orient the much necessary research on this period.

**1c) 1989-2015**

In 1989 a fundamental legislative change took place: a constitutional revision abolished the principle of irreversibility of the revolutionary nationalisations (Constitutional Law 1/89, of 8 July), meaning that the previously nationalised assets (including the banks) could now be re-privatised. Three years rater, the legal framework for banking also changed, with Decree-Law 298/92, of 31 December 1992 (Table I). The new legislation was a watershed for Portuguese banking. An important purpose of it was to make Portuguese legislation converge with that of other countries participating in the European Union (EU), especially in the European Monetary Union (EMU). The new legislation incorporated the basic principles of the first three EU banking directives (77/780/EEC, 89/646/EEC, 92/30/EEC, of 12 December 1977, 15 December 1989, and 15 April 1992, respectively). Since EMU presupposed freedom of circulation of capital, the legislation incorporated the principles of freedom of establishment and of supplying of services by foreign banks. The BoP retained a series of important powers that limited the impact of such principles, especially with respect to the installation of foreign banks.

In what concerns entry in the market, the Government was for the first time stripped of its powers to authorise the opening of banks or mergers and acquisitions. These powers were now attributed to the BoP, which in principle should follow strictly technical and prudential criteria, rather than political ones. The only power left to the Government was that of setting the minimum capital requirement for opening a bank. The legislation adopted the principles of universal banking, something completely opposite to the spirit of the 1960-1975 legislation. The nature and the number of operations banks could now perform increased thus significantly. Limits to these operations became residual (see Table I). Banks were now given a large margin of action.

All of this was accompanied by the process of progressive liberalisation of banks’ interest rates: between 1988 and 1993 all limits to interest rates were abolished and banks became for the first time entirely free to set the level of their rates (rather than the Government or the BoP) (Table I). In 1991, Decree-Law 24/91, of 11 January, allowed agricultural credit banks to associate in one large bank, which in turn was allowed to perform regular banking operations. In 1993, CGD was transformed into a universal bank, subject to the same regulations as all other universal banks, although exclusively owned by the State (Decree-Law 287/93, 20 August 1993). Decree-Law 298/92 also introduced a deposits guarantee.

The subperiod from 1989 onward was perhaps the most lively in Portuguese banking history since the late nineteenth century and the first decades of the twentieth century. This had fundamentally to do with two processes, separated by about twenty years: the massive privatisation programme of the 1990s and the financial crisis of the years 2008-2015. The first process led all banks that had been nationalised in 1975 to be re-privatised between 1989 and 1999 (with one exception). Legal conditions for banking competition apparently improved massively in this period. It is not surprising that there was then a flourishing of new banks. Between 1992 and 2004 the market went through a hectic phase, with banks opening, closing and merging at notable rates (Valério, org., 2010). By 1997 the number of Portuguese banks had multiplied to 27 and that of foreign ones to 13 – the overall number being, thus, 40 (Associação Portuguesa de Bancos a, 1997). In the late 1990s and the early twenty-first century there was a very important process of consolidation, with a series of quite spectacular merging and acquisitions episodes involving the largest banks (Amaral, 2015b). The second process, the 2008-2015 financial crisis, led to the disappearance of a few banks, some counting among the most important (Amaral, 2015b).

These movements in the market were reflected in the concentration indices presented in Figures 2 and 3. Both the HHI and the concentration ratios increased mildly in the early 1990s, from 0.09 to 0.10, despite the appearance of the new banks. This is because most of the new banks were of small dimension, meaning that the market remained dominated by just a few institutions. The big mergers and acquisitions of the late twentieth century were reflected in a massive increase in both indicators, with HHI reaching a historically high level of 0.16-0.17, the CR5 ratio jumping to 80% and the CR3 ratio reaching 60% to 65%. Thanks to them, the Portuguese market became the most concentrated in Europe (Costa, 2014). In the next sections we will assess what was the impact of such concentration on competition.

1. **The model**

Rosse and Panzar (1977), Panzar and Rosse (1987), Bikker and Haaf (2002), and Bikker (2007) are the main proponents of the theory underlying the tests presented in this paper. The starting point of the theory is a reduced-form revenue equation that is based on two main assumptions. The first is that firms in a certain market operate in long-run equilibrium. Any firm can be described by a production function in which its outputs are , and where are inputs. To this function corresponds a revenue function where are exogenous variables affecting the firm’s revenues, and a cost function, in which are the input prices and are exogenous variables affecting the firm’s costs. The firm’s profits are . The second assumption is that in a perfectly competitive market with free entry and exit, marginal revenue equals marginal cost and economic profit is zero:

where the asterisk refers to marginal values.

The main point of the model is to verify how a change in input prices affects revenue , or . In this case the purpose is to assess the sensitivity of revenue to joint changes of input prices . A monopoly or a perfectly colluding oligopoly imply that an increase in input prices affects revenue and output negatively; perfect competition implies that an increase in input prices does not affect revenue and output; monopolistic competition implies an intermediate behaviour.

Panzar and Rosse use a measure of competition that corresponds to the sum of the elasticity of revenue with respect to the input prices. If we define as equilibrium revenue, then

(1)

An that is 0 or negative corresponds to a monopoly or a perfectly colluding oligopoly, an that is 1 corresponds to perfect competition, and an between 0 and 1 (corresponds to monopolistic competition, a form of oligopoly having competitive features similar to perfect competition in the long run, although not in the short run.

We use this framework to implement two panel data tests whose baseline specifications are:

(2)

(3)

The dependent variable in (2) is the natural logarithm of interest revenue divided by total assets and in (3) is the natural logarithm of interest revenue not divided by total assets . As the banks’ books did not separate consistently throughout the period interest from commissions this variable lumps the two items together. and should, thus, be understood as proxies. In what concerns independent variables, we have first input prices. Data constraints also forced us to use proxies. The true wage variable would have been average wage, i.e. total wage expenditure divided by the total number of workers, but information on the number of workers is not always available in the banks’ accounts. The proxy used was the ratio of total wage expenditure to total assets. Similar limitations exist concerning the price of capital . In the absence of straight information on the capital expenditure associated with the capital assets used by the banks for production, we proxied the variable with the ratio of the banks’ expenditures excluding interest and wages to fixed assets. The proxy for the average funding cost is the closest to the true variable, as it corresponds to the ratio of interest paid to interest bearing debt. The H-statistic is equal to the sum of the coefficients of the three variables:

Besides input prices, we have a set of exogenous variables to account for differences between banks in terms of cost, risk, and structure. One of these is the funding mix, which is measured by the ratio of demand deposits to total debt . Another is the importance of loans in the total composition of assets, which is measured by the ratio of loans to total assets , and can be understood as a measure of credit risk. Still another is the credit mix, measured by the ratio of interbank deposits to loans . One further variable is the ratio of off-balance sheet activity to total assets , in order to capture the importance of the banks’ activities going beyond mere financial intermediation. Branching is measured by the ratio of total assets to total branches . The capital-assets ratio , or leverage, is used here as a general measure of the risk assumed by the banks. We also use the the ratio of other revenue to interest revenue . The problem of the separation between interest and commissions repeats here. Our variable corresponds to the difference between income from interest and commissions lumped together and other types of income that are reported in the banks’ books, e.g. return on foreign exchange operations, return on stock, and an item that lumps together various other types of income without distinguishing them. Finally, is an error term. We implement these tests for the three periods 1960-1975, 1975-1989, and 1989-2015.

We also performed the same tests using total revenue, divided by total assets and not divided by total assets , as the dependent variable. Total revenue includes not only revenue coming from interest, fees, and commissions, but also from other sources, namely those mentioned above (return on foreign exchange operations, return on stock, and some more other varied types of operations). The same caveats as above apply.

The issue of the use of total assets as a denominator in the dependent variable has been a bone of contention in the literature on Panzar-Rosse tests. The idea underlying the practice of dividing the dependent variable (interest or total revenue) by total assets is that the size of banks should be controlled for and that total assets provide a measure of size. But Jacob Bikker, Laura Spierdijk, and Paull Finnie (Bikker *et al.*, 2007) raised doubts concerning this specification, namely that a scaled dependent variable (i.e. a dependent variable divided by total assets) is consistent with a price equation but not with a revenue equation. This interpretation, although initially contentious, has become standard, as shown in Bikker *et al*. (2012). We adhere to it in this paper.

The validity of Panzar-Rosse tests has recently been questioned, sometimes by the exact same authors that have pioneered their use. Bikker *et al*. (2012) have suggested that negative values of the H-statistic, which in principle would reveal the presence of a monopoly or of a colluding oligopoly, can be consistent with short-run competition, although not long-run competition. By contrast, positive values of the H-statistic cannot occur under a monopoly or a colluding oligopoly. More recently, Shaffer and Spierdijk (2015) have even questioned the latter conclusion, finding five theoretical scenarios where positive values of the H-statistic might appear in the presence of monopoly or a colluding oligopoly – to note is the fact that these scenarios are theoretical, not empirical.

In the face of such doubts, these authors have proposed an alternative method to Panzar-Rosse tests in order to measure the degree of competition in a market. Their preferred measure is now the Lerner Index (Shaffer and Spierdijk, 2013 and 2015). But the Lerner Index suffers from equally serious problems of implementation (or even worse). The starting point of the Lerner Index is that, in perfect competition, price equals marginal cost. The farther one is from the other, the farther the companies in a market would be from a situation of perfect competition.[[2]](#endnote-2) The first problem with the Lerner Index is that, if it measures anything, it measures only the effects of market power on price, and not on all other non-price forms of competition (Léon, 2014). This means you can have a high divergence between price and marginal cost while competition is present in the market, as long as firms compete on such things as product variation, advertising or (in the case of banks) branching. More seriously still, some authors have shown that price-cost margins might increase while competition is also increasing (Léon, 2014) and that price-cost margins might decrease while market power increases (Léon, 2014, and Boone, 2008). As noted by Roberts (2014), prices can be high in a certain market because companies face a high sunk cost which they need to recoup, even when the market is highly competitive. On the other hand, a company may engage in predatory pricing in order to exclude competitors, even with high marginal costs. Most fundamentally, the Lerner Index is based upon an unobservable variable: marginal cost. Since the variable is not observable, calculations of Lerner indices are based on econometric exercises involving a large degree of arbitrariness: results vary widely depending on the assumptions and methods used.

Perhaps the most promising new way of measuring competition is the Boone indicator (Boone, 2008). But it is again a measure with many issues. First, and particularly important for economic historians, who always have to deal with questions of data scarcity, it is much more data intensive than the Panzar-Rosse and Lerner Index tests. Second, as in the case of the two previous tests, it cannot produce a measure that can be interpreted unambiguously, as it is possible to interpret higher or lower values of it in different senses (higher or lower competition) (Léon, 2014).

This leaves us at a point where using one measure over the other does not impinge on preferring a better measure for a worse one. Rather, it impinges on using each of them signalling the necessary caveats. A fruitful line of inquiry in an agenda for future research would be to use different measures and then compare in order to try and extract regularities (or not). This paper uses the Panzar-Rosse H-statistic, with all its limitations.

1. **The data**

The data used in the tests mentioned above were obtained in the banks’ balance sheets, presented in the annual reports, whose references are given in the bibliography. It was not possible to find data for the following 10 banks: ABN Amro, Banco Argentaria, Caja de Ahorros de Galícia, Caja de Ahorros de Pontevedra, Vigo y Ourense, Chase Manhattan, Citibank, Generale Bank, Loyds Bank, Banco Sabadell, and Banco Universo. Most of these banks are foreign and started operating on various dates only after the late 1980s. Some have meanwhile closed, others have existed only for a few years, all of them are of small dimension. The fact that these institutions do not appear in our sample, although relevant, should not be critical to the results, due to their relatively small importance in the market. Additionally, the fact that they were small means all of them were “price-takers”, mostly being affected by the market rather than affecting it.

All money variables were translated into euros at the 1999 exchange rate (when the euro was created) and deflated using a GDP deflator having 2011 as the base year (from Pordata.pt, see bibliography). We could thus obtain an unbalanced panel of yearly data with 12,552 observations. An OLS regression was used to estimate the model. In order to deal with factors that are specific to each bank and are unobserved we used a model with time-invariant bank-fixed effects. Descriptive statistics are presented in Table II.

1. **The results**

As noted by Panzar and Rosse (1987), the test is effective only if the market is in long-run equilibrium. Shaffer (1982) and Molyneux *et al.* (1994) have proposed to control for this condition by running the equation above with the return on assets (ROA) of the banks as the dependent variable, testing if the resulting H-statistic is significantly different from zero or not. In the latter case we can assume that the market is in long-run equilibrium, the idea being that in long-run equilibrium rates of return are uncorrelated with input prices. The first four rows in Table III displays the results for the overall period and the three sub-periods. In all of them the H-statistic is not significantly different from zero, meaning we can assume long-run equilibrium.

We can thus proceed to investigate the behaviour of the market in the three sub-periods defined above: 1960-1975, 1975-1989 and 1989-2014. Table III presents the various tests. We tested for monopoly or for a perfectly colluding oligopoly with a one-sided test in which the null hypothesis was *H≤0* and the alternative hypothesis was *H>0*. We also tested for perfect competition, or a null hypothesis of *H=1* versus *H≠1*, with a two-sided test.

The results do not always coincide in the various specifications. In the case of the specifications with interest revenue and total revenue scaled by total assets, it is possible to reject the null hypotheses for monopoly and for perfect competition for the three periods (Table III, rows 5 to 10). This means that, according to these tests, despite the drastic institutional changes during those years, the Portuguese commercial banking market functioned consistently under monopolistic competition. Following the now conventional interpretation of Panzar-Rosse tests with the dependent variable normalised by total assets, which makes it correspond to a price equation, this means that the various institutional shocks did not have an impact on the ability of Portuguese banks to set prices, i.e. banks always competed moderately making use of their ability to price their products from 1960 to 2015.

But competition through pricing is just one form of competition. And the actual extent to which Portuguese banks competed can only be assessed by the equations where the dependent variables are not scaled by total assets. And in those cases the results are different. Irrespective of the dependent variable being interest revenue or total revenue, it is not possible to reject the null hypothesis of perfect competition for the 1960-1975 period (Table III, rows 11 and 14). In the 1975-1989 period it is possible to reject clearly the null hypothesis of a colluding oligopoly but not that of perfect competition, even if the significance of the figures is marginal (p-values of 0.060 and 0.070) (Table III, rows 12 and 15). As for the 1989 to 2015 period, it is not possible to reject the null hypothesis of a colluding oligopoly in the two tests (Table III, rows 13 and 16).

These results are quite surprising. First, we have the case of the possibility of existence of perfect competition in the 1960-1975 period, according to the non-scaled tests, although this is a point that had already been raised by Amaral (2015a). Second, we have also the somewhat surprising fact that the market did not present the features of a perfectly colluding oligopoly in the 1975-1989 period, when banks were owned by the State. Monopolistic competition in this period is the most consistent result of all the tests (for the scaled and non-scaled specifications), with some results marginally in favour of perfect competition. Finally, we have the equally surprising fact that competition did not increase in the 1989-2015 period and might even have approached the nature of a colluding oligopoly (according to the non-scaled tests), despite privatisation and the adoption of liberalising norms. Such results require some discussion, which we provide next.

1. **Some comments and future research**

Various conclusions can be extracted from the results above. In what concerns the first period (1960-1975) we can see that, despite the highly restrictive legislation, the market displayed some form of competition, a reality that had already been captured by Amaral (2013 and 2015a). The main question is: why a system so apparently restrictive was able to generate a degree of competition of some significance? Maybe, as noted again by Amaral (2013 and 2015a), and in a somewhat paradoxical way, the sort of regulation imposed by the legislation allowed for an approximate replication of one of the most important consequences of strong competition: low profits. Banks’ margins (on both interest and credit) were low and almost entirely set by the Government, and banks were not free to look for alternative ways of obtaining higher returns (such as stock). As some degree of contestability existed in the market, this may have led them to compete, as the expectation of driving competitors out of business (or being driven out of business by competitors) was legitimate to a certain extent. We should note that, in comparative terms, Portugal had a kind of market regulation not differing much from several Western countries in the period (AAVV, 1994, Cassis *et al*., eds, 1995, Battilossi and Cassis, eds., 2002, and Amaral, 2013 and 2015a). In some countries, regulation was even stricter, as in France, for instance, where the largest commercial banks had been nationalised in 1945 and the whole financial system was put under a heavily discretionary official mechanism (Wyploz, 1999, Quenouëlle-Corre, 2005, and Monnet, 2012). Furthermore, Portuguese banks were then free from a practice widely spread in Western Europe in those days: that of holding large amounts of public debt among their assets (Wyploz, 1999, and Battilossi and Cassis, eds., 2002). This was due to the fact that the Portuguese government followed a quite orthodox fiscal policy, with persistent budget balance, contrary to the majority of European countries then. Despite the fact that heavy regulation of different guises was rather common in Europe up to the 1970s, various studies point to the existence of some competition in various countries: Battilossi (2000), looking at Europe in general, Bordo *et al*. (1994), for Canada, Capie and Billings (2004), for the UK, or Pons (2002) and Pueyo (2003), for Spain. If this is true for those countries it is not surprising that similar results (or results pointing to an even higher level of competition) are registered in the case of Portugal. Still, more research is needed on this period.

Even more interesting is the next period, when generalised public ownership of banks and the imposition of administrative mergers still delivered monopolistic competition. Why did this happen? Unfortunately, there are no studies dedicated specifically to this period, equivalent to Amaral (2013 and 2015a) for the previous one. Consequently, we can only put forth a few hypotheses in the expectation of some future detailed research: was the autonomy granted to each bank under the State-owned enterprise statute, as noted in Section 1, enough for banks to compete with each other? This might even be more significant as they were given new targets in order to attract clients: emigrants’ remittances, foreign currency deposits, medium- to long-run-credit. Another possibility is that the new financial institutions created after 1979 (leasing companies, investment companies, regional development societies) did compete to a certain extent with commercial banks. Since private capital could not enter in commercial banking, it was in these institutions that we could find more dynamism. These are just suggestions. What we need is an in-depth analysis into one of the least known periods in Portuguese economic history.

At this moment in history, Portugal followed against the liberalising trend that started in the 1970s and deepened in the 1980s in Europe and North America (AAVV, 1994, Cassis *et al*., eds, 1995, Wyploz, 1999, Battilossi, 2000, Battilossi and Cassis, eds., 2002), something that included an important contribution to finance Government spending, which moved from the orthodoxy of the previous period into fast expansion and persistent budget imbalance. Commercial banks were involved in this, in manners similar to those existing in other European countries. The particular method adopted in Portugal consisted in the imposition of credit ceilings to banks at a level below the amount of resources they could gather in deposits, thus forcing them to use the amount above the ceiling in public debt (Beleza and Macedo, 1988, and Mexia and Leite, 1992). This seems to have lowered the degree of competition in the Portuguese banking market (as shown by the results above) but, interestingly enough, not to the point of making it vanish altogether. The level of competition among Portuguese banking seems to have been not too dissimilar to that found in other countries: although not using Panzar-Rosse tests, Bordo *et al*. (1994), Capie and Billings (2004), and Pons (2002) (and also Pueyo, 2003) find signs of competition in Canada, the UK, and Spain, respectively. The same kind of conclusion can be reached when comparing with works that use Panzar-Rosse tests: Nathan and Neave (1989) have found perfect competition in the Canadian banking system in 1982, but monopolistic competition in 1983 and 1984, Molyneaux *et al*. (1994) have found a perfectly colluding oligopoly in Italy between 1986 and 1989 but monopolistic competition in France, Germany, Spain, and the UK. Vesala (1995) has found monopolistic competition in Finland between 1985 and 1992.

Interesting is also the fact that the introduction of highly favourable legislation to competition in the late-1980s and early-1990s was not enough to truly increase it, and might even have made it decline. Although we do not know much about the specifics of the functioning of the market, we have a few more studies available for this period, some of them even using the same technique of this paper. That is the case of Bikker and Haaf (2002), Bikker *et al.* (2007), and Boucinha and Ribeiro (2009). The first and the last of these papers point to the existence of monopolistic competition in the period 1991-1998 and 1991-2004, respectively. These tests raise some questions, however, as they lump together all kinds of banking institutions (commercial, savings, cooperative, investment…), even if competition between some of these groups was virtually non-existent, thanks to their largely different objects. The second of the mentioned studies, despite suffering from the same issues, points to ambiguous results similar to the ones we also present in our paper, with some tests indicating monopolistic competition and others a colluding oligopoly in the period 1998-2004.

Barros and Modesto (1997), Pinho (2000) and Canhoto (2004) use different techniques, thus preventing any form of straightforward comparison with our results. But some of them are in the same spirit as ours. That is the case of Barroso and Modesto (1997), who have found a strong regulatory presence of CGD, conditioning the competitive behaviour of the other agents in the market between 1990 and 1995. Canhoto (2004) also does not go entirely against our conclusions: according to this work the market functioned as an oligopoly between 1990 and 1995, although the author suggests the appearance of “some competition” (although of an unspecified sort) after 1993. Pinho (2000) suggests competition increased during the 1988 to 1992 period but never classifies the market in a clear way: was it an oligopoly that remained an oligopoly at the end of the period? Or did it acquire the nature of a perfectly competitive market? Despite all these works, a lot remains to be understood on the functioning of the Portuguese banking system in this period. And the big question remains: why did not competition grow much more in an environment specifically designed to promote it? Perhaps the discretionary power left in the hands of the BoP helps explain these results, something that would require an investigation into how the Bank as a regulatory agency might have been affected by the participants in the market in a way preventing contestability and competition. To note is the fact that this might be true of other countries as well, which could explain why was there not an explosion of competition in Europe when the new legislation was introduced in the 1990s. This raises the question if the discretionary power the European legislation entrusted to central banks at the national level did not work against the spirit of the law, thus failing not only to introduce Europe-wide competition but also to increase it at the national level. These results place Portugal among the countries with least competitive banking markets (close to Finland, Norway, Greece or Spain, in Europe, and Australia, Canada, Japan, and the US, outside of Europe) (compare with the various Panzar-Rosse tests in Bandt and Davies, 2000, Biker and Haaf, 2002, Bikker *et al*., 2007, Beck, 2008, OECD, 2010 and 2011, Anginer *et al*., 2012). Thus, Portugal does not appear as an isolated case at the international level.

**Conclusion**

In this paper we used a statistical test developed by James Rosse and John Panzar (Rosse and Panzar, 1977, and Panzar and Rosse, 1987) in order to measure and classify competition in the Portuguese commercial banking market between 1960 and 2015. The basic purpose was to verify if and how competition in that sector was affected by the drastic institutional changes the economy passed through in that period. We subdivided the overall period into three sub-periods, one going from 1960 to 1974, corresponding to an authoritarian regime which was very suspicious of free markets and competition and regulated the economy accordingly; another going from 1975 to 1989, when there was a coup d’état that overthrew the authoritarian regime and initiated a revolutionary process of communist or socialist tendencies, eventually leading to the nationalisation of large swathes of the economy, including the entire commercial banking sector; and a final period, from the late-1980s and early-1990s until 2015, when a liberalising wave swept the country and reverted virtually all previous nationalisations and the country entered into an institutional environment that should have been more favourable to competition. The results provided some surprises: according to price tests, the nature of competition did not change throughout the entire period, being of the monopolistic competition sort, despite the radical institutional changes. According to general competition tests, we can find signs of perfect competition in the 1960-1975 period, despite the heavily restrictive institutional setting, and signs of a colluding oligopoly after the 1980s, despite the increasingly liberalising framework. According to these tests, the commercial banking market presented stronger competitive signs during the period of integral State-ownership between 1975 and the mid-1980s than afterwards, when banks were privatised and the legislative setting aimed explicitly at promoting competition.

These results raise several questions over the real effect of each of the institutional frameworks despite their self-proclaimed purposes. More studies are required to fully understand how this market functioned in each of the sub-periods.

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**Figure 1**

**Share of commercial banks assets and of savings banks assets (% of overall financial assets), Portugal, 1960-2006**

Source: INEa (1960-2006)

**Table I – Main Elements of the Portuguese Banking Legislation**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **General**  **Conditions** | **Capital Requirements** | **Interest Rates** | **Cash Reserves** | **Operations** | **Credit** | **Stock/Bonds holdings** | **Entry in market** | **Mergers & Acquisitions** | **Opening of Branches** |
| **Decree-Law 42,641, 12th November 1959** |  | 50 million escudos in Lisbon and Porto, and 20 million outside of the two cities for opening banks; 30 million escudos for incorporated banks already functioning in Lisbon or Porto, and 10 million for those functioning outside the two cities; 10 million escudos for non-incorporated banks in Lisbon and Porto; 5 million outside of the two cities | Interest on demand deposits: 50% of the Banco de Portugal’s rediscount rate.  Interest on loans: not more than 1.5% above that same rediscount rate.  No limits on time deposits until 1965 (Decree-Law 46,492, 18 August): 1.25% for time deposits of less than one month; 2.5% for time deposits between 30 days and 90 days; 3.5% for deposits between 90 days and one year. | Equal to at least 15% of demand deposits and of time deposits of less than one month; and 5% of time deposits of more than one month, with the remaining 85% backed by credit instruments of no more than three months’ maturity and no less than one year (slight changes until 1973, Valério, org., 2010) |  | Forbidden to grant credit above 10% of the bank’s capital plus the reserve fund to one single firm or individual. This limit was raised to 30% if the collateral was constituted of public bonds; and to 20% if it had the form of bank guarantees. | Forbidden to acquire stock of another firm in more than the reserve fund plus 20% of the capital of the bank; and could not exceed 20% of the capital of the firm. | Dependent on authorisation by the Minister of Finance. | Dependent on authorisation by the Minister of Finance. | Dependent on authorisation by the Minister of Finance. |
| **Decree-Law 132-A/75, 14 March 1975** | Nationalisation of commercial banks |  |  |  |  |  |  |  |  |  |
| **Decree 644/75, 15 November 1975** |  |  | Set by the Bank of Portugal | Set by the Bank of Portugal |  |  |  |  |  |  |
|  | **General**  **Conditions** | **Capital Requirements** | **Interest Rates** | **Cash Reserves** | **Operations** | **Credit** | **Stock/Bonds holdings** | **Entry in market** | **Mergers & Acquisitions** | **Branches** |
| **Decree-Law 729-F/75, 22 December 1975** | Transformed nationalised banks into state-owned enterprises |  |  |  |  |  |  |  |  |  |
| **Decree-Law 729-H/75, 22 December 1975** |  |  |  |  | Commercial banks can open accounts in foreign currency, as long as belonging to emigrants |  |  |  |  |  |
| **Constitution 1976** | Forbade privatisation of all companies nationalised in 1975 (including commercial banks) |  |  |  |  |  |  | The Constitution forbade entries in the market. | Became an administrative issue, dependent on government decision. | Became an administrative issue, dependent on government decision. |
| **Law 46/77, 8 July 1977** | Sets the limits between the public and the private sectors of the economy (commercial banking is public) |  |  |  |  |  |  |  |  |  |
| **Decree-Law 353-O/77, 29 August 1977** |  |  |  |  | Commercial banks can open accounts of non-residents, but only of time deposits |  |  |  |  |  |
|  | **General**  **Conditions** | **Capital Requirements** | **Interest Rates** | **Cash Reserves** | **Operations** | **Credit** | **Stock/Bonds holdings** | **Entry in market** | **Mergers & Acquisitions** | **Branches** |
| **Decree-Law 353-J/77, 29 August 1977** |  |  |  |  | Commercial banks can grant medium- and long-run credit |  |  |  |  |  |
| **Decree-Law 137/79, 18 May 1979** | Investment companies could be established |  |  |  |  |  |  |  |  |  |
| **Decree-Law 499/80, 20 October 1980** | Regional Development Societies could be established |  |  |  |  |  |  |  |  |  |
| **Law 11/83, 16 August 1983** | Authorised the Government to revise the limit between the public and the private sectors of the economy established by Law 46/77 |  |  |  |  |  |  |  |  |  |
| **Decree-Law 406/83, 19 November 1983** | Opened commercial banking to private activity |  |  |  |  |  |  |  |  |  |
|  | **General**  **Conditions** | **Capital Requirements** | **Interest Rates** | **Cash Reserves** | **Operations** | **Credit** | **Stock/Bonds holdings** | **Entry in market** | **Mergers & Acquisitions** | **Branches** |
| **Decree-Law 51/84, 11 February 1984** |  | All banks had to be incorporated and with a minimum capital requirement of 1,5 billion escudos |  |  |  |  |  | Dependent on the authorisation by the Minister of Finance. | Dependent on the authorisation by the Minister of Finance. | Dependent on the authorisation by the Minister of Finance. |
| **Decree-Law 246/85, 12 July 1985** | Investment funds (real estate) could be established |  |  |  |  |  |  |  |  |  |
| **Decree-Law 17/86, 5 February 1986** | Venture capital companies could be established |  |  |  |  |  |  |  |  |  |
| **Decree-Law 56/86, 18 March 1986** | Factoring companies could be established |  |  |  |  |  |  |  |  |  |
| **Government Warning 5/88, 15 September 1988** |  |  | Abolished limits to interest rates on loans, except mortgages |  |  |  |  |  |  |  |
| **Government Warning DD 2341, 18 March 1989** |  |  | Abolished limits to interest rates on mortgages |  |  |  |  |  |  |  |
|  | **General**  **Conditions** | **Capital Requirements** | **Interest Rates** | **Cash Reserves** | **Operations** | **Credit** | **Stock/Bonds holdings** | **Entry in market** | **Mergers & Acquisitions** | **Branches** |
| **Constitutional Law 1/89, 8 July 1989** | Abolished the principle of irreversibility of the assets nationalised in 1975 and 1976 |  |  |  |  |  |  |  |  |  |
| **Government Warning 5/92, 20 May 1992** |  |  | Abolished limits to interest rates on time deposits |  |  |  |  |  |  |  |
| **Decree-Law 298/92, 31 December 1992** |  | Set by the Government |  |  | - All kinds of credit operations, including leasing and factoring;  - Buying and selling of stock and bonds;  - Interbank operations;  - Participation in the capital of companies;  - Selling of insurance contracts |  | Forbidden to acquire stock of other firm in more than 15% of the capital and reserve of the bank; and forbidden to have more than 25% of the voting rights of the participated firm. | Dependent on the authorisation by the Bank of Portugal. | Dependent on the authorisation by the Bank of Portugal. | Dependent on the authorisation by the Bank of Portugal. |
| **Decree-Law 287/93, 20 August 1993** | Transformed the Caixa Geral de Depósitos into a comercial bank, although owned by the State |  |  |  |  |  |  |  |  |  |

**Figure 2**

**Market Concentration in Portuguese Commercial Banking (Hirschman-Herfindahl Index, Assets and Deposits), 1960-2015**

Sources: authors’ calculations based on: 1960-1981: banks’ annual reports – see bibliography; 1982-1987: Alpalhão and Pinho, 1990; 1988-2009: Associação Portuguesa de Bancos a, 1989-2010; 2010-2015: Associação Portuguesa de Bancos b, 2011-2016

**Figure 3**

**Concentration Ratios in Portuguese Commercial Banking (Assets and Deposits), 1960-2015, (%)**

CR3: Assets/Deposits of the three largest banks in the market; CR5: Assets/Deposits of the five largest banks in the market.

Sources: see Figure 2

**Table II**

**Summary statistics**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variable | Observations | Mean | Std. Dev. | Min. | Max. |
| IRA | 868 | 0.0687 | 0.0407 | 0.0066 | 0.2865 |
| TRA | 868 | 0.0893 | 0.0511 | 0.0146 | 0.3867 |
| IR | 868 | 329,000,000 | 822,000,000 | 156.0225 | 790,000,000 |
| TR | 868 | 465,000,000 | 119,000,000 | 160.7741 | 918,000,000 |
| WL | 868 | 0.0121 | 0.0053 | 0.0016 | 0.0408 |
| WK | 868 | 2339.657 | 34493.43 | 0.0503 | 562417.6 |
| WF | 868 | 1.3506 | 10.6238 | 0.0061 | 304.9049 |
| DTD | 868 | 0.3740 | 0.2152 | 0.0007 | 0.9900 |
| LA | 868 | 0.5040 | 0.1843 | 0.0029 | 1.4770 |
| IBL | 868 | 0.1925 | 0.6798 | 0.0004 | 13.8738 |
| OBSA | 868 | 0.8083 | 0.9323 | 0.0036 | 4.5383 |
| AB | 868 | 44,200,000 | 137,000,000 | 2186,375 | 17,300,000,000 |
| KA | 868 | 0.0830 | 0.0776 | 0.0010 | 0.7945 |
| OIIR | 868 | 0.2168 | 0.1602 | 0.0038 | 0.9231 |

Legend: IRA = Interest revenue scaled by total assets; TRA = Total revenue scaled by total assets; IR = Interest revenue not scaled by total assets; TR = Total revenue not scaled by total assets; WL = Wages; WK = Price of capital; WF = Funding cost; DTD = Deposits/Total debt; LA = Loans/Total assets; IBL = Interbank deposits/Loans; OBSA = Off-balance sheet/Total assets; AB = Total assets/Branches; KA = Capital/Total assets; OIIR = Other revenue/Interest revenue

**Table III**

**Equilibrium tests and H-statistic – various periods, Portugal**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |  |  |  | ***H*** | **p-value (H0)** | ***p-*value**  **(H=1)** | **R2** | **N** |
| **(1960-2015)** | -2.800  (-4.28)\* | -0.095  (-0.80) | 0.075 (2.88)\* | 0.001 (0.02) | -0.102  (-1.34) | -0.077  (-0.67) | 0.066 (2.01)\*\* | -0.228  (-4.28)\* | -0.072  (-3.73)\* | 0.671 (9.24)\* | 0.207 (3.40)\* | 0.8719 | - | - | 0.2776 | 8680 |
| **(1960-1975)** | -1.834  (-2.48)\*\* | 0.032 (0.20) | 0.054 (3.93)\* | -0.106 (-2.19)\*\* | 0.215 (1.34) | 0.270 (1.39) | 0.015 (0.47) | 0.085 (0.84) | -0.231 (-6.22)\* | 0.146 (1.73)\*\*\* | 0.085 (1.34) | 0.9055 | - | - | 0.2572 | 2610 |
| **(1975-1989)** | -8.59  (-5.74)\* | -1.051  (-3.08)\* | 0.414 (5.20)\* | 0.237 (2.73)\* | 0.167 (0.86) | -0.312  (-1.06) | 0.091 (1.82)\*\*\* | 0.360 (3.62)\* | 0.055 (0.89) | 0.483 (3.82)\* | 0.350 (2.96)\* | 0.2823 | - | - | 0.5979 | 1820 |
| **(1989-2015)** | -1.639  (-0.66) | 0.325 (1.32) | -0.116  (-1.10) | 0.140 (1.69)\*\*\* | -0.377  (-3.29)\* | 0.541 (2.82)\* | 0.139 (1.68)\*\*\* | -0.256  (-2.49)\*\* | -0.053  (-0.35) | 0.272 (1.50) | 0.239 (1.91)\*\*\* | 0.1717 | - | - | 0.0730 | 3550 |
| **(1960-1975)** | -1.801  (-8.10)\* | 0.492  (10.41)\* | 0.019  (4.32)\* | 0.021  (1.50) | -0.268  (-5.44)\* | 0.093  (1.62) | -0.024  (-2.41)\*\* | 0.150  (4.91)\* | 0.016  (1.36) | -0.021  (-0.79) | -0.186  (-9.39)\* | 0.5320 | 0.0000 | 0.0000 | 0.6537 | 2700 |
| **(1975-1989)** | -4.945  (-12.82)\* | 0.125  (1.37) | -0.012  (-0.57) | 0.122  (5.26)\* | -0.169  (-3.21)\* | 0.078  (1.01) | -0.046  (-3.46)\* | -0.028  (-1.04) | 0.133  (8.22)\* | -0.265  (-8.04)\* | -0.132  (-4.16)\* | 0.2350 | 0.0191 | 0.0000 | 0.6077 | 1910 |
| **(1989-2015)** | -0.206  (-0.36) | 0.378  (6.74)\* | 0.054  (2.30)\*\* | 0.152  (7.89)\* | -0.143  (-5.18)\* | 0.264  (5.95)\* | 0.062  (3.30)\* | -0.054  (-2.23)\*\* | -0.076  (-2.14)\*\* | -0.085  (-2.36)\*\* | -0.308  (-10.75)\* | 0.5843 | 0.0000 | 0.0000 | 0.4804 | 4070 |
| **(1960-1975)** | -1.156  (-5.40)\* | 0.455  (10.00)\* | 0.014  (3.24)\* | 0.025  (1.82)\*\*\* | -0.387  (-8.14)\* | -0.005  (-0.09) | -0.028  (-2.92)\* | 0.145  (4.93)\* | -0.008  (-0.73) | 0.011  (0.45) | 0.036  (1.88)\*\*\* | 0.4933 | 0.0000 | 0.0000 | 0.5706 | 2700 |
| **(1975-1989)** | -4.052  (-10.67)\* | 0.147  (1.64) | -0.020  (-0.98) | 0.120  (5.28)\* | -0.235  (-4.53)\* | 0.017  (0.22) | -0.041  (-3.12)\* | -0.010  (-0.36) | 0.109  (6.87)\* | -0.245  (7.56)\* | 0.031  (1.00) | 0.2476 | 0.0123 | 0.0000 | 0.5082 | 1910 |
| **(1989-2015)** | 1.137  (1.89)\*\*\* | 0.443  (7.54)\* | 0.117  (4.72)\* | 0.145  (7.17)\* | -0.103  (-3.57)\* | 0.170  (3.65)\* | 0.060  (3.04)\* | -0.062  (-2.43)\*\* | -0.078  (-2.10)\*\* | 0.010  (0.26) | -0.005  (-0.18) | 0.7049 | 0.0000 | 0.0000 | 0.3449 | 4070 |
| **(1960-1975)** | 0.639  (0.63) | 0.823  (3.82)\* | -0.028  (-1.39) | 0.078  (1.21) | -0.940  (-4.18)\* | 0.189  (0.72) | -0.119  (-2.63)\* | -0.190  (-1.37) | 1.012  (19.22)\* | -0.573  (-4.77)\* | -0.016  (-0.18) | 0.8738 | 0.0001 | 0.5759 | 0.3831 | 2700 |
| **(1975-1989)** | -2.133  (-2.49)\*\* | 0.504  (2.49)\*\* | -0.022  (-0.48) | 0.101  (1.95)\*\*\* | -0.371  (-3.16)\* | -0.076  (-0.44) | -0.083  (-2.79)\* | 0.010  (0.18) | 1.257  (35.08)\* | -0.434  (-5.93)\* | -0.163  (-2.32)\*\* | 0.5826 | 0.0091 | 0.0602 | 0.7664 | 1910 |
| **(1989-2015)** | 8.031  (8.37)\* | -0.059  (-0.63) | -0.040  (-1.02) | 0.038  (1.18) | 0.037  (0.80) | 0.260  (3.50)\* | -0.067  (2.13)\*\* | 0.115  (2.83)\* | 0.551  (9.26)\* | -0.525  (-8.71)\* | 0.077  (1.61) | -0.061 | 0.5378 | 0.0000 | 0.2841 | 4070 |
| **(1960-1975)** | 1.282  (1.28) | 0.787  (3.71)\* | -0.033  (-1.67)\*\*\* | 0.081  (1.28) | -1.058  (-4.78)\* | 0.094  (0.36) | -0.123  (-2.76)\* | -0.196  (-1.43) | 0.988  19.08)\* | -0.541  (-4.58)\* | 0.205  (2.31)\*\* | 0.8355 | 0.0002 | 0.4579 | 0.3622 | 2700 |
| **(1975-1989)** | -1.232  (-1.43) | 0.526  (2.58)\*\* | -0.032  (-0.68) | 0.101  (1.95)\*\*\* | -0.432  (-3.67)\* | -0.143  (-0.83) | -0.078  (-2.60)\* | 0.028  (0.47) | 1.232  (34.21)\* | -0.416  (-5.65)\* | 0.0002  (0.00) | 0.5949 | 0.0081 | 0.0696 | 0.7718 | 1910 |
| **(1989-2015)** | 9.392  (9.94)\* | 0.005  (0.06) | 0.022  (0.57) | 0.030  (0.96) | 0.075  (1.65)\*\*\* | 0.168  (2.30)\*\* | -0.069  (-2.21)\*\* | 0.108  (2.72)\* | 0.547  (9.34)\* | -0.431  (-7.26)\* | 0.381  (8.05)\* | 0.0581 | 0.5518 | 0.0000 | 0.2171 | 4070 |

\*The variable is significant at 1% significance level; \*\*The variable is significant at 5% significance level; \*\*\*The variable is significant at 10% significance level

1. From 2007 onwards the national statistical agency stopped producing banking statistics. Financial information continued to be published on a consistent basis by the Bank of Portugal. Unfortunately, the criteria used do not allow for comparison with previous periods. [↑](#endnote-ref-1)
2. The formula for the Lerner Index is , where is the index’ coefficient, is price and is marginal cost. The index ranges between 0 and 1 and the higher the values of the index, the higher the degree of monopoly power. [↑](#endnote-ref-2)