INTEGRATION AND COMPETITION IN THE EUROPEAN FINANCIAL MARKETS[*]

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ABSTRACT

Financial integration in Europe should affect the competition between markets and intermediaries and generate a convergence of both interest rates and margins among the different countries. This paper analyses the evolution of the convergence in interest rates and the level of competition and its inequalities among the European banking systems for the period 1993 to 2001. The inequality index used –the Theil index- allows us to break down the inequalities so that the importance of either a country effect or a specialization effect is quantified. If the former effect dominates it would mean that the national banking markets are segmented as a consequence of the existence of obstacles or barriers to the integration. On the other hand, the dominance of the latter effect would be related to the different level of competition depending on the type of banking specialization.

Keywords: integration, competition, European financial markets

JEL classification: F36, G15

RESUMEN

La integración financiera en Europa debe producir efectos sobre la competencia entre mercados e intermediarios (reducción de precios, costes de intermediación y márgenes) y generar convergencia en tipos de interés y márgenes entre países. Este trabajo analiza la evolución de la convergencia en tipos de interés y el nivel de competencia en los sectores bancarios europeos en el periodo 1993-2001. Además, se estudia el grado de desigualdad de los niveles de competencia mediante la aplicación del índice de Theil. Este índice permite la descomposición de la desigualdad de forma que se cuantifica la importancia de tanto efectos país como efectos especialización. Si los primeros dominasen querría decir que los mercados bancarios nacionales estarían segmentados como consecuencia de la existencia de barreras u obstáculos a la integración. Por otro lado, si dominasen los efectos especialización, el nivel de competencia dependería del tipo de especialización bancaria.

Palabras clave: integración, competencia, mercados financieros europeos.

1. Introduction

Monetary as well as financial integration are essential aspects of what is the actual economic integration in Europe and for the exploitation of its potential advantages. Both are interrelated *a priori* given that the existence of a common currency should contribute to the integration of the financial markets (banking and capital markets). Similarly, financial integration does not only condition European integration in general, it in turn is also conditioned by the process of unification in other economic as well as extra economic aspects (cultural and political).

The awaited benefits of integration for financial service consumers have recently been synthesized from a macro economic perspective by Heinemann and Joop (2002). For the consumers, this ought to mean a broader range of assets and services to choose from, a reduction in prices resulting from the intensification of competition, and an improvement in the portfolio composition. At a macro level, in line with other papers (King and Levine (1993), Levine (1997), Rajan and Zingales (1998), Beck, Levine and Loayza (2000), Levine, Loayza and Beck (2000), Levine and Zervos (1998), Cetorelli and Gambera (2001)), the effects of integration are the cause of developments in the financial markets, stimulating saving and capital accumulation, and improving the efficiency of the allocation of resources and the financing of technological innovations which, in the end, boost income and employment growth.

Since the appearance of the first evaluations of the potential contributions of integration to improving the working of the European economy and those of its member countries (for example, the Cecchini Report, the European Community Commission, 1988), rather important changes have taken place, especially in the monetary and financial spheres, both inside and outside the EU, which allow us to determine whether clear progress is being made in the direction initially targeted[1]:

a) Amongst those decisions taken within the EU, the most obvious is the creation of the single currency, adopted by eleven countries in 1999 (and Greece in 2001), and put into movement in 2002. Also significant are the free movement of capital and the second banking directive (1993), and the compromises of nominal convergence that preceded the introduction of the

[1] More recently, in February 2002, a new study commissioned by the European Round Table (Heinemann and Jopp, 2002: Gyllenhammer report) suggested that potencial for higher growth through financial integration could be up to 0.5%-0.7% of GDP per annum.

Euro (1996). More recently, in 1999, the European Commission approved the Financial Services Action Plan. The FSAP is a set of measures to be developed in the period 1999-2005 which aims to: a) create a single wholesale financial market, b) open up the retail markets and make them more secure, and c) seriously revise and homogenize the financial regulations of the member states.

b) With regard to changes in the financial environment in general in which the EU economies have participated, it is important to remember that, above all, the nineties witnessed an acceleration of financial integration on a world scale propelled in part by the development of information and communication technology (ICT). This autonomous factor, independent of the European construction, is mainly reflected in the integration of the capital markets in terms of both the flow among these and the synchronized evolution of their stock market value.

One of the expected benefits of integration, on a micro as well as a macro scale, is the cheapening of financial prices resulting from the intensification of competition. However, it is only when integration results in a genuine increase in competition that it becomes tangible and can provide all the potential benefits. For that reason, it is very important to analyse the evolution of competition in the financial markets to check whether the process of integration is giving the expected results in terms of welfare.

This paper analyses the evolution of the convergence in interest rates and the level of competition, starting from the construction of a synthetic indicator of competition for the banking firms. The causes of the inequality in the competition levels associated with different types of barriers to the integration and competition, which is an important issue for the design of the economic policy, is analysed based on this indicator. Thus, the persistence of differences in the level of competition between countries can be due to the existence of entry barriers or obstacles of different type (natural, policy-induced, etc.) that protect banking firms against the foreign competition. By breaking down the inequalities using the Theil index, the importance of a possible country effect is quantified (which would mean that the national banking markets are segmented as a consequence of the existence of obstacles to the integration) and also of a specialization effect (related to different level of competition depending on the type of banking specialization). These different sources of inequality are relevant to evaluate if the European initiatives aiming to achieve greater financial integration are resulting in higher levels of competition and lesser differences between countries, and also to consider to what extent convergence towards the “one price law” can be expected.

The study is structured as follows. Section 2 contains an analysis of the evolution of the interest rates of the different countries with the aim of evaluating whether or not their trajectories are converging at aggregate price levels distinguishing the behaviour of the wholesale and retail (banking) markets. Section 3 describes the methodology used for estimating the level of competition or market power of the banking firms, and reports the empirical results for the banking sectors of the European Union. Based on the indicator of competition, and using the Theil index, section 4 analyses the origin of the inequalities in the levels of competition, showing the importance of a country effect and a specialization effect as proxy's variables to the entry barriers. Section 5 details the conclusions reached.

2. Integration and convergence in interest rates

The Cecchini Report (1998) characterized a situation of complete financial integration based on the hypothesis of a levelling of asset and financial service prices. In a scenario of perfect mobility of capital, this *law of one price* should result, under identical conditions of risk and maturity of the operations, in the levelling of interest rates, but not so when these conditions are not the same. Thus, the greater the extent to which such circumstances are approximated, the greater the *convergence* in the interest rates, especially in markets where the homogeneity of the products and the operations is closer.

Nevertheless, although the majority of the change factors mentioned previously may have boosted the conditions that favour interest rate convergence both at a macroeconomic level and at a microeconomic level, the circumstances of the agents may continue to differ –between countries and within each country- and, although the intensification of competition ought to reduce margins and prices to a certain degree, the *law of one price* may not be a feasible goal (Limier and Sander, 2002). This is even more likely to be the case if risk differences (associated with the characteristics of the clients and the operations) and cultural differences remain, not to mention bank-client relationships involving long-term strategies (based on the information imperfections typical of banking markets[2].

[2] See Scholtens and van Wensveen , 2000; and Cetorelli and Gambera, 2001.

The empirical evidence on interest rate convergence presented here is based on a dispersion measure popularised by growth economics, *σ-convergence* (Barro and Sala-i-Martín, 1992), used to analyse whether economies approach the same income *per capita* when they reach their steady state. Such growth models consider that there may exist circumstances which propel each economy to converge to its own steady state (*conditional convergence*) if they differ in a number of fundamental parameters. The analogy for interest rate convergence consists of considering that economies may contain characteristics, in their microeconomic units that could explain a limited, or conditional, convergence in market prices.

The data used comes from the statistics of the European Central Bank. The limitations of the information for this period have meant a reduction in the number of countries considered in order to guarantee the homogeneity of the sample and avoid affecting the significance of the exercises[3]. The period considered is from 1993, in which crucial changes occurred, to 2001, the last year available.

Seven interest rates are considered: two corresponding to the public debt markets (3-year government debt yield and long-term government debt yield in national markets) and five to the banking markets (time deposits, mortgage loans to households, consumer loans, short-term loans to enterprises and long-term loans to enterprises).

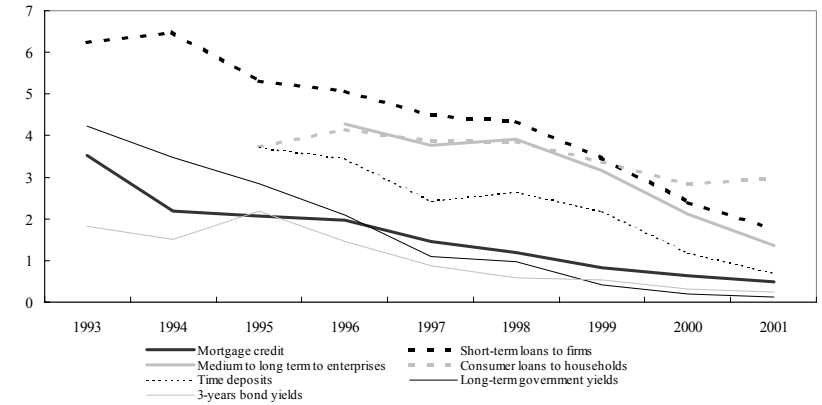
With regard to the evolution of interest rates, the free movement of capital and the implementation of the second banking directive (1993) mark the end of a period of greater instability and the beginning of another characterized by the reduction of nominal interest rates. Parallel to the fall in interest rates is a reduction in the dispersion (measured by the standard deviation) of the nominal interest rates of the different countries (figure 1). Towards the end of the period one can observe that the inequality between the countries is very much reduced in the interest rates of the public debt markets (wholesale markets) but are greater in the rates corresponding to the banking markets (retail markets).

Within the banking markets, different degrees of convergence intensity in the interest rates are detected at the end of the period: greater convergence occurring

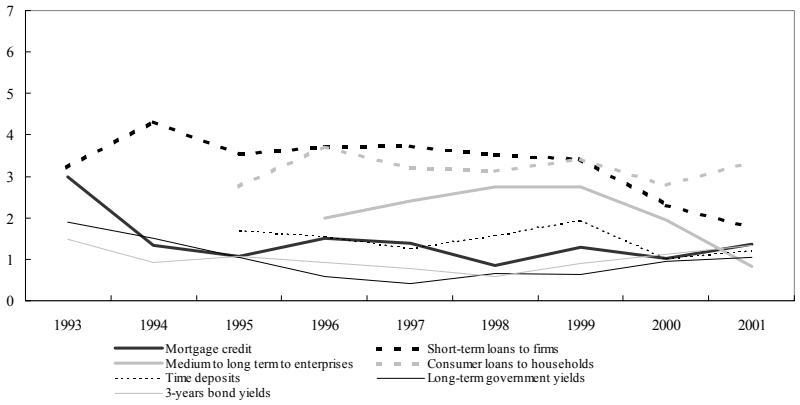
[3] In each figure standard deviation is computed only for those countries with information available for the whole sample period.

Figure 1. s-convergence of selected interes rates. European Union

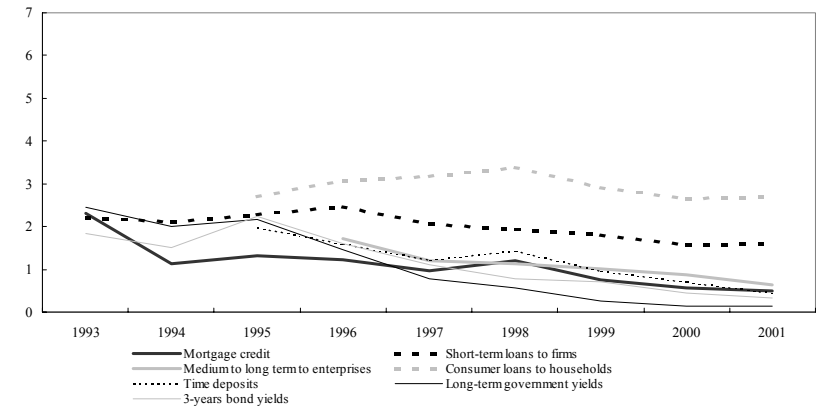
a) Non-weighted standard deviations. Nominal interest rates



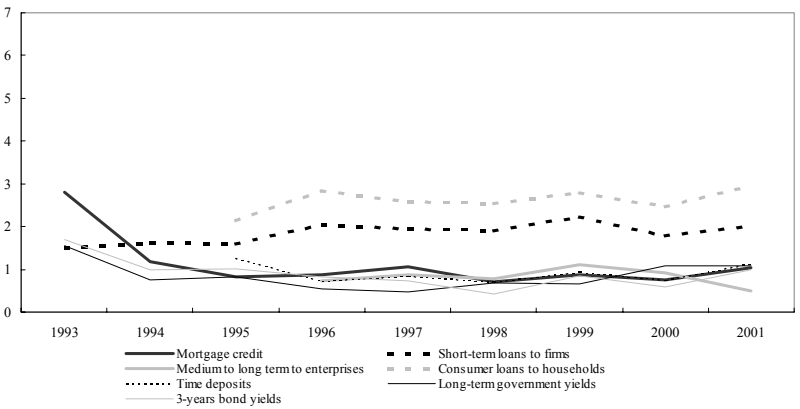
b) Non-weighted standard deviations. Real Interest rates



c) Weighted standard deviations. Nominal interest rates



d) Weighted standard deviations. Real Interest rates



amongst the rates for products with a limited margin for the differentiation of operation characteristics (time deposits and mortgage loans to households) and greater inequality in the operations in which more product differentiation exists (consumer loans, short-term loans to enterprises and long-term loans to enterprises).

Given the notable differences in size amongst the EU countries, it is not of the same importance that the large countries are the most similar or are approximating to a greater extent, as the small countries. When the interest rates are weighted for country size to calculate the dispersion indicators, it is observed that the starting inequalities were less and, above all, there is a substantial reduction in the inequality of medium and long-term enterprise loan interest rates. All seems to indicate that it is the small countries which produce a large share of the inequality, particularly in enterprise loans. The speed of convergence in the smaller countries is generally slower, totally disappearing at the consumer loan level.

When real interest rates are used, it is observed that the initial differences were less than they appeared to be in nominal terms, and the rate at which convergence progresses is somewhat slower. This indicates that interest rate convergence is in part affected by the process of convergence of inflation rates, developed in preparation for the adoption of the Euro as the single currency, making the real convergence of interest rates somewhat less than the nominal one. Similarly, when weighted standard deviations are considered two things occur: the inequality level is reduced, but in two of the retail markets, short-term loans to firms and consumer loans, there is no convergence whatsoever.

To summarize, the evidence with respect to interest rate convergence presented above provides a number of interesting results. Firstly, convergence has taken place but this is due to a large extent to the reduction in the inflation differentials and to the general drop in nominal interest rates. Secondly, convergence has been greater in those financial products that are more homogenous among countries thanks to nominal convergence and the monetary union -such as the public debt markets, time deposits and mortgage loans to households-, resulting in their corresponding markets becoming more *contestable*. Thirdly, when country size is taken into consideration, it is observed that the initial inequalities were generally smaller because they were in part derived from the disparities in the small countries, this effect being most noticeable in the case of medium and long-term loans to enterprises that have also clearly converged. Finally, in certain retail markets (consumer loans and short-term loans to enterprises) convergence proceeds with much more difficulty and greater inequalities remain between these interest rates. This result suggests two alternative (non exclusive) hypotheses surrounding the persistence of these differences in banking activity: that in such

activities exist market power or that they are derived of a greater heterogeneity of operations (and clients) that have not been reduced, and to which the following section is dedicated.

3. Competition in banking markets

The persistence of a wider range of interest rates in several of the banking markets may be the result of a lesser degree of competition in these, due to the existence of obstacles or barriers to the financial integration. For that reason, this section evaluates whether the set of circumstances that have accompanied the liberalization measures tending to the creation of a single market have caused variations in the differences in the degree of competition among the different banking industries of the European Union, and for this purpose Lerner indices were calculated from the estimation of marginal costs and prices.

3.1. The Lerner index

The estimation of Lerner indices has been widely used in the banking sector as indicators of degrees of market power. Some of the most important studies in this area are Shaffer (1993) for Canadian banks, Ribon & Yosha (1999) for the case of Israel, Angelini & Cetorelli (1999) for Italian banks, Maudos & Pérez (2001) for the Spanish banking sector, and Fernández de Guevara et al. (2002) for a sample of countries of the European Union.

In the case of banking firms, the model most often used as a reference from which a Lerner index expression is obtained is the Monti-Klein imperfect competition model[4]. This model examines the behaviour of a monopolistic bank faced with a deposit supply curve of positive slope $D(r_D)$ and a loan demand curve of negative slope $L(r_L)$. The decision variables of the bank are D (volume of deposits) and L (volume of loans), and for simplicity's sake the level of capital is assumed to be given. The bank is assumed to be a price taker in the inter-bank market (r), so that the objective function of profits to be maximised is as follows:

$$\Pi = \Pi(L, D) = \left(r_L(L) - r\right)L + \left(r - r_D(D)\right)D - C(L, D) \qquad (1)$$

[4] Monti (1972) and Klein (1971). See a survey in Freixas and Rochet (1997).

so that profit is the net interest income between deposits and loans, after deducting the transformation costs *C(L,D)*. The first order conditions with respect to deposits and loans are as follows:

$$\begin{aligned}\frac{\partial \Pi}{\partial L} &= \frac{\partial r_L}{\partial L} + r_L - r - \frac{\partial C}{\partial L} = 0 \\ \frac{\partial \Pi}{\partial D} &= -\frac{\partial r_D}{\partial D} D + r - r_D - \frac{\partial C}{\partial D} = 0\end{aligned} \tag{2}$$

or,

$$\begin{aligned}\frac{\left[r^*_L - r - \frac{\partial C}{\partial L} \right]}{r^*_L} &= \frac{1}{e_L} \\ \frac{\left[r - r^*_D - \frac{\partial C}{\partial D} \right]}{r^*_D} &= \frac{1}{e_D}\end{aligned} \tag{3}$$

e_D and e_L being the elasticities of demand for deposits and loans, respectively.

The Lerner index for expression (3) represents the extent to which the monopolist's market power allows it to fix a price above marginal cost, expressed as proportional to the price (relative margin). In the case of perfect competition, the value of the index is zero, there being no monopoly power. Starting from this extreme case, the lower the elasticity of demand, the greater the monopoly power to fix a price above the marginal cost. The relative margin (Lerner index) informs of the level of efficiency reached in the market and is therefore a suitable candidate for analysing the evolution of competition.

The extension of the model to the case of an oligopoly (N banks) provides the following expression of the first order conditions:

$$\begin{aligned}\frac{\left[r^*_L - r - \frac{\partial C}{\partial L} \right]}{r^*_L} &= \frac{1}{Ne_L} \\ \frac{\left[r - r^*_D - \frac{\partial C}{\partial D} \right]}{r^*_D} &= \frac{1}{Ne_D}\end{aligned} \tag{4}$$

which differs from the case of monopoly only in that the elasticities are multiplied by the number of firms (N). With this simple adaptation, the Monti-Klein model can be

reinterpreted as a model of imperfect competition with two extreme cases: monopoly (N=1) and perfect competition (N=infinity).

3.2. Empirical approach: results

The database does not provide sufficiently detailed information about the profit and loss account for the calculation of separate prices for deposits and loans[5]. Consequently, we use a single indicator of banking activity in the empirical model of this study and, as in Shaffer (1993) and Berg and Kim (1994), banking output is proxied by the total assets of each firm. The starting assumption is that the flow of banking goods and services produced by a bank is proportional to its total assets. With this approximation, an average price (that includes interest and non-interest income) and a marginal cost (financial and operating cost) for the banking output is computed, estimating the Lerner according to the following expression:

$$\frac{[p - MC]}{p} \qquad (5)$$

where p is the average output price and MC is the total marginal cost.

The calculation of marginal costs is based on the usual specification of a translogarithmic cost function where as a measure of production we use total assets and three inputs prices (price of labour, price of capital and price of deposits) are computed. The estimation of the costs function (and hence of the marginal costs) is done separately for each country, allowing the parameters of the cost function to vary from one country to another to reflect different technologies. Fixed effects are also introduced in order to capture the influence of variables specific to each firm. Finally, a trend is included to reflect the effect of technical change, which translates into movements of the cost function over time. As usual, the estimation is made under the imposition of restrictions of symmetry and of grade one homogeneity in input prices.

To estimate Lerner indices data were obtained in a standardised fashion from Bankscope database (Bureau Van Dijk). The sample includes the fifteen banking sectors of the European Union for the period 1993-2000. The criterion for banks to be included in the sample is that information must be available on all the variables necessary for the

[5] In the case of loans, the profit and loss account does not give the financial income associated with these separately, it appears jointly with other financial products (fixed income investments, for example). In the case of deposits, the financial costs are included with those of other liability products.

estimation of the Lerner index. In addition, input price data required for the cost function estimation should lie within 2.5 standard errors away from their mean values in each year. Using this data selection criterion, the sample consists of a total of 18,330 observations of non-consolidated banking firms (see table 1).

Table 1. Number of banks by country

	1993	1994	1995	1996	1997	1998	1999	2000
Austria	59	68	72	75	118	128	127	116
Belgium	43	44	47	53	48	39	37	33
Germany	1.015	1.303	1.492	1.559	1.548	1.611	1.516	1.145
Denmark	46	47	50	49	45	42	39	37
Spain	62	60	58	59	59	57	62	65
Finland	6	7	8	9	12	14	11	7
France	219	210	223	224	228	215	211	184
United Kingdom	42	48	47	54	42	40	44	42
Greece	2	2	5	5	4	-	2	4
Ireland	-	-	3	5	5	6	5	7
Italy	103	111	140	303	332	342	370	346
Luxembourg	65	67	69	75	62	59	66	67
Netherlands	13	18	20	19	21	16	16	15
Portugal	19	17	23	24	27	28	29	23
Sweden	8	8	12	15	13	12	10	12
European Union	1.702	2.010	2.269	2.528	2.564	2.609	2.545	2.103

Source: BankScope (Bureau Van Dijk).

Table 2 shows the evolution of the Lerner index for the 15 EU countries from 1993 to 2000. For the weighted average of the EU, the Lerner index has shown a slight increase or the whole period, being the value in 2000 (0.145) 10% greater than the corresponding to 1993 (0.132).

By countries, the market power has increased in ten out of the fifteen countries of the EU. In the last year considered (2000), the Lerner index was placed in amounts higher than 20% in Finland, UK, Italy and Spain, placing in the opposite extreme Luxembourg, Denmark and Germany as the most competitive banking sectors.

The conclusion drawn from the evolution of the Lerner index is that, in spite of the deregulating measures implemented in the last years, the competitive conditions have not intensified in the major part of the banking sector of the EU. This result agrees with the evidence obtained in other papers. De Bandt and Davis (2000) and Corvoisier and Gropp (2002) show that in the main European countries and in some banking products there existed situations of monopolistic competition in the 1990s, and the

Table 2. Evolution of the Lerner index by country

	1993	1994	1995	1996	1997	1998	1999	2000
Austria	0,1050	0,1099	0,1176	0,1334	0,1360	0,1460	0,1212	0,1348
Belgium	0,0856	0,0824	0,0959	0,1033	0,1160	0,1424	0,1432	0,1334
Germany	0,1286	0,1365	0,1275	0,1312	0,1276	0,1192	0,1146	0,1063
Denmark	0,1285	0,1585	0,1312	0,1380	0,1305	0,1183	0,1241	0,1006
Spain	0,1596	0,1436	0,1378	0,1454	0,1709	0,1862	0,2117	0,2086
Finland	0,1355	0,1228	0,0993	0,1780	0,2268	0,2416	0,2373	0,2729
France	0,1174	0,1081	0,0962	0,1007	0,1063	0,1131	0,1347	0,1287
United Kingdom	0,2025	0,1937	0,1857	0,2151	0,1757	0,1944	0,2273	0,2355
Greece	0,0777	0,1114	0,0763	0,0848	0,1198	-	0,2180	0,1988
Ireland	-	-	0,1585	0,1965	0,1677	0,2053	0,1095	0,0889
Italy	0,1443	0,0903	0,1238	0,1329	0,1314	0,1929	0,2034	0,2135
Japan	0,1184	0,1219	0,1793	0,1871	0,1961	0,2258	0,2336	0,2810
Luxembourg	0,1198	0,1021	0,1099	0,1188	0,1122	0,1302	0,1116	0,0969
Netherlands	0,0688	0,0802	0,0808	0,0898	0,0949	0,0978	0,1122	0,1120
Portugal	0,1643	0,1400	0,1182	0,1521	0,1755	0,1958	0,2050	0,1809
Sweden	0,1505	0,1523	0,1834	0,1876	0,1534	0,1496	0,1161	0,1145
European Union	0,1322	0,1267	0,1222	0,1310	0,1306	0,1401	0,1466	0,1452

Source: Own elaboration.

monopoly situation was even accepted by banks that acted in small markets. Bikker and Haaf (2002) also offer proof in favour of the existence of monopolistic competition in a wide sample of countries (European and non-European), competition being weaker in local markets and stronger in international markets[6].

One of the possible causes of the differences in the competition levels observed between countries is the specialization in a given banking business area. In as much as the importance of the barriers to the integration and the competition is different depending on the type of banking business (retail banks, universal banks, investment banks, etc), productive specialisation could explain the differences in competition among countries. In other words, the level of competition can differ among countries on the basis of the relative weight of banks with different productive specialisation.

[6] De Bandt and Davis (2000) and Bikker and Haaf (2002) measure competition using the Panzar-Rosse model. Corvoisier and Gropp (2002) analise whether the increase in concentration (due to the recent wave of mergers in the euro area) has offset the increase in competition in European banking through deregulation by estimating a simple Cournot model or bank pricing.

The analysis of the importance of specialisation in the explanation of the differences of market power between countries requires dividing the sample companies into groups of banks with a similar banking orientation. Using cluster techniques, we identify banking groups of similar specialisation[7]. The criterion used to determine the clusters is to group firms in accordance with some measurement of their distance from certain individual characteristics, each group being as different as possible from the others. The variables chosen for grouping banking firms were: loans, other earning assets, fixed assets, deposits, other sources of funding and equity, all of them expressed as ratios of total assets.

The cluster methodology enables us to detect four productive specialisation groups[8] (table 3):

* Cluster 1: Retail banks. This cluster groups 1,322 firms representing 23% of the sample in terms of total assets in 2000. This group, formed mainly by savings banks and commercial banks, is financed mainly through deposits (81%), distributing its resources between, mainly, loans (64%) and other earning assets (31%).

* Cluster 2: Investment banks. This group captures the major part (73%) of its resources in the deposit market, but devotes most of them (68%) to earning assets other than loans. 330 banks are included here representing 22% of the sample.

* Cluster 3: Universal banks. This group is characterised by financing itself mainly by the capturing of deposits (61% of total assets), though they diversify their asset portfolio to a greater extent between loans (44%) and other earning assets (47%). The total number of banks contained in CL3 is 369, it being the most important group in terms of total assets (43% of the sample).

* Cluster 4: Specialised banks. This cluster contains only 82 banks of the sample (mainly real estate/mortgage banks and medium and long-term credit banks). It is financed by means of instruments other than deposits and devotes its resources to granting loans (65%) and other earning assets (31%).

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[7] See more details in Maudos, Pastor and Perez (2002).

[8] For this purpose we used a non-hierarchical method (k-means), though a hierarchical one (Ward) was first used to determine the number of clusters.

Table 3. Specialization groups in the European Banking sectors. 2000.
Percentage over total assets

	Cluster 1 *Retail banks*	Cluster 2 *Investment banks*	Cluster 3 *Universal banks*	Cluster 4 *Specialised banks*	Total *Sample*
Loans	63,95	25,09	44,08	65,43	46,87
Other earning assets	30,70	67,99	47,28	31,33	46,25
Total earning assets	94,66	93,08	91,35	96,76	93,12
Fixed assets	1,67	0,62	0,68	0,25	0,85
Non earning assets	3,67	6,30	7,96	2,99	6,03
Total assets	**100,00**	**100,00**	**100,00**	**100,00**	**100,00**
Total deposits	80,98	72,68	61,11	21,08	63,65
Total money market funding	4,37	5,10	8,26	6,16	6,42
Customer and short term funding	84,49	76,91	68,86	24,10	69,10
Other funding	6,67	8,78	14,53	69,16	17,72
Other (non interest bearing)	3,54	8,34	9,80	2,87	7,24
Loan loss reserves	0,01	0,05	0,06	0,10	0,05
Other reserves	0,23	2,14	2,15	0,05	1,47
Equity	5,06	3,79	4,59	3,72	4,42
Income statement					
Interest income	5,56	5,23	5,25	6,04	5,41
Interest expense	3,49	4,45	4,04	5,28	4,15
Net interest income	2,06	0,78	1,21	0,76	1,26
Other operating income	0,81	0,93	1,01	0,25	0,86
Gross income	2,87	1,71	2,23	1,00	2,12
Overheads	1,85	1,10	1,42	0,51	1,35
Personnel expenses	1,03	0,58	0,79	0,23	0,73
Other administrative expenses	0,67	0,45	0,54	0,25	0,52
Goodwill write-off	0,22	0,09	0,11	0,06	0,12
Net income	1,02	0,61	0,80	0,49	0,77
Profit before tax	0,01	0,00	0,01	0,00	0,00
Number of firms	1322	330	369	82	2103
% total assets	22,96	22,24	43,31	11,49	100,00

Source: BankScope (Bureau Van Dijk) and own elaboration.

The calculation of the Lerner index for each cluster (table 4) shows that the differences between these clusters are substantial, especially those between retail banks and specialised banks. The averages of the relative margins between investment banks and specialised banks and between universal banks and retail banks are much more similar, the convergence of the last two clusters being considerable. In general terms, the relative margins are not experiencing any notable changes, with the exception of the universal banks where the Lerner index has increased by two percentage points. Given the specialisation profile of each *cluster*, the results show that the banks in which the traditional deposits-and-loans activity holds greater weight, work with greater

margins and these tend to increase in relative terms (especially in retail banks). On the other hand, in the two groups of banks which are more orientated towards the wholesale market and in the specialised banks (in mortgage loans and in public sector financing, markets in which interest rate convergence was observed to be greater), the margins are less and getting smaller.

Table 4. Evolution of the Lerner index by clusters

	1993	1994	1995	1996	1997	1998	1999	2000
Retail Banks	0,1632	0,1727	0,1652	0,1741	0,1736	0,1649	0,1761	0,1750
Investment Banks	0,1244	0,1056	0,1012	0,1034	0,1036	0,1162	0,1200	0,1191
Universal Banks	0,1299	0,1191	0,1181	0,1316	0,1351	0,1515	0,1578	0,1558
Specialised Banks	0,1066	0,1099	0,1063	0,1123	0,1125	0,1084	0,1115	0,0961

Source: BankScope (Bureau Van Dijk).

4. Inequalities in the level of competition

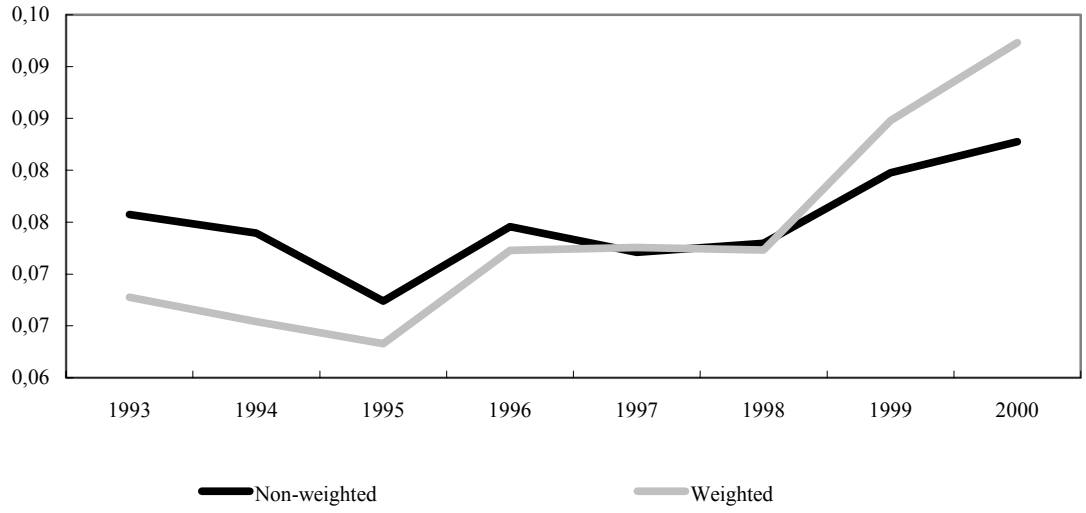
One of the reasons that justify the existence of a low degree of integration in retail banking markets compared with wholesale markets is the existence of barriers or obstacles associated with factors such as the importance of proximity, the banking relationship, the local area of information, etc. The greater the importance of these barriers, the lesser the pressure of competition on the national markets and, consequently, the more segmented the markets will be.

The results obtained in the previous section have revealed the existence of important inequalities in the level of competition or market power among the banking sectors of the EU. With the purpose of going deeply into the analysis of the inequalities in the competition levels, figure 2 shows the evolution of the standard deviation of the Lerner index (σ-convergence) calculated at the firm level for the whole sample. The figure shows that far from producing a σ-convergence phenomenon, the inequalities in market power have risen during the 90´s, increasing the standard deviation by 9% from 1993 to 2000.

With the objective of taking into account the different size of the banking firms and to amend a possible bias in the σ-convergence measurement, figure 2 also contains the evolution of the weighted standard deviation of the Lerner index, using as weights the total assets of each bank in the sample. The figure shows, once again, an increase in the inequalities in the market power within the European Union, raising the standard

deviation by 36%. Consequently, upon using the weighted standard deviation, the divergence has become even more marked, existing in the year 2000 a inequality level superior to one obtained using the non-weighted standard deviation.

Figure 2. s-convergence in Lerner index. European Union



Source: Own elaboration.

An important issue for the design of economic policy measures is the analysis of the causes or origin of the inequality in the competition levels associated with different types of barriers to the integration and competition. Thus, the persistence of differences in the level of competition between countries can be due to the existence of natural (differences in language, culture, etc.) and policy-induced (differences in tax treatment, portfolio restriction, regulation, etc.) barriers and/or, alternatively to these, to the typical circumstances of banking operations (banking relationship, the importance of proximity, information and supervision costs, etc.). Empirically, the natural and policy-induced barriers are reflected in the existence of a *country effect* (the country to which the entity belongs) while the importance of the barriers derived from the typical circumstances of banking operations are reflected in the existence of a *specialisation effect* (the cluster to which the entity belongs).

To calculate the relative importance of a possible country effect or specialisation effect in explaining the origin of the inequalities of margins, a number of inequality indices will be used that may be decomposed into two components, one which measures internal or within-group inequality (in this case internal inequality within each country or specialised group) and another which measures between-group inequality (external

inequality between countries or between specialised groups). The index used will be the Theil index[9], the general formulation of which is defined by:

$$T(\beta) = \frac{1}{\beta(\beta-1)} \sum_i p_i \left[\left(\frac{x_i}{\mu} \right)^{\beta} - 1 \right] \tag{6}$$

where x_i is the study variable, μ the weighted average of variable x_i, p_i the weight of each individual i in the total sample and β a factor measuring the sensitivity of the index to transfers between individuals with values in high levels of x_i to individuals with low level values. The index will be used in this work in the case where $\beta=0$[10], so that the previous expression of the Theil index may be written as:

$$T(0) = -\sum_i p_i \log \left(\frac{x_i}{\mu} \right) \tag{7}$$

Let us suppose that the total sample may be separated into G groups, that each group represents a percentage p_g of the total sample and that the weighted average of variable x_i of each grouping is μ_i. Then, the decomposition property of the family of Theil indices allows us to express the previous equation in the following manner:

$$T(0) = \sum_{g=1}^{G} p_g T_g(0) + T_0(0) \tag{8}$$

where

$$T_g(0) = -\sum_{i \in n_g} \left(\frac{p_i}{p_g} \right) \log \left(\frac{x_i}{\mu_g} \right) \tag{9}$$

is the internal inequality (within groups) index of each grouping and

$$T_0(0) = -\sum_g p_g \log \left(\frac{\mu_g}{\mu} \right) \tag{10}$$

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[9] More details on different inequality measures and their properties may be found in Shorrocks (1980) and Shorrocks (1984).

[10] The Theil index with $\beta=0$ is used because in doing so each one of the groups will be weighted by the proportion that the group represents of the total number of individuals, thus favouring the inequality of those groups which represent a greater percentage of the total sample.

is the external inequality (between groups) index between groupings.

Thus, the decomposition of the Theil index defined by equations (8)-(10) will be calculated for the Lerner index of the banking companies in the sample. The weights to be used (p_i and p_g) will be the percentage in terms of assets that each entity (or group) represents of the total sample.

To analyse whether such differences exist more between firms or between countries, a Theil inequality index is calculated for the Lerner index (table 5). Its evolution also shows an increase in inequality in recent years. The main part of the inequality is within countries but the inequality between countries is also relevant and is growing in importance, representing one third of the total at the end of the period. This result indicates two things: a) the elimination of differences between countries would not eliminate the major percentage of inequality in the margins, which is internal, but b) removing the barriers which generate the portion of inequality which is external would be indeed a relevant objective of political economy.

Table 5. Decomposition of the Theil index by country

	Theil index			**Percentage over total Theil index**	
	Total	***Within country***	***Between country***	***Within country***	***Between country***
1993	0,103	0,083	0,019	81,16	18,84
1994	0,117	0,093	0,024	79,38	20,62
1995	0,105	0,085	0,019	81,46	18,55
1996	0,121	0,097	0,024	80,09	19,92
1997	0,107	0,092	0,015	86,15	13,85
1998	0,100	0,074	0,026	73,99	26,01
1999	0,116	0,081	0,036	69,43	30,57
2000	0,143	0,092	0,051	64,40	35,59

Source: BankScope (Bureau Van Dijk).

The decomposition of the within-cluster and between-cluster inequality by means of the Theil index (table 6) indicates that both are growing, but that the inequality between clusters is increasing at a faster rate and, consequently, its weight is growing. This result is in agreement with the disparate evolution of the margins of each group and with the growth of the Lerner index in the case of the universal banks. Nevertheless, the inequality between clusters is smaller than the inequality between countries (table 4), demonstrating the importance that national barriers still retain.

Table 6. Decomposition of Theil index by cluster

	Theil index			Percentage over total Theil index	
	Total	*Within cluster*	*Between cluster*	*Within cluster*	*Between cluster*
1993	0,103	0,094	0,009	91,56	8,44
1994	0,117	0,098	0,019	83,91	16,08
1995	0,105	0,087	0,017	83,45	16,55
1996	0,121	0,100	0,021	83,20	17,51
1997	0,107	0,090	0,017	84,27	15,71
1998	0,100	0,088	0,012	87,89	12,03
1999	0,116	0,103	0,014	88,24	11,76
2000	0,143	0,125	0,018	87,43	12,57

Source: BankScope (Bureau Van Dijk).

To analyse the relationship between specialisation and belonging to a particular country even further, one last decomposition of internal and external (between countries) inequality has been carried out for the banks of each *cluster* (table 7). The inequality between the entities of each *cluster* is growing in all the groups and in both indicators. The group with the greatest inequality in margins is the investment banks and the one with the least inequality, the retail banks. Furthermore, the results reinforce the notion that the differences between countries are indeed relevant in many of the specialisation groupings. The external inequalities are growing in all the groups with the exception of the investment banks, and are greatest of all in the case of the universal banks, where they represent two thirds of the inequality at the end of the period.

To summarise, the analysis of banking relative margins and the inequalities to be found in these indicate the following. Firstly, it has been observed that the relative margin increases. Secondly, sizable margin inequalities between countries have been verified in the whole group of entities as well as in each specialisation grouping analysed. These differences are particularly high in the case of the universal banks. Thirdly, when the specialisation of the entities is considered, it is observed that the margins are less in those specialisations which are more connected with markets in which interest rates have converged more between countries (investment banks and specialised banks), and are greater in those which are more orientated towards deposits and loans markets (retail and universal banks).

Table 7. Decomposition of Theil index by cluster and countries. Decomposition by country in each cluster

a) Cluster 1. Retail banking

	Theil index			Percentage over total Theil index	
	Total	*Within country*	*Between country*	*Within country*	*Between country*
1993	0,051	0,042	0,010	81,04	18,96
1994	0,047	0,040	0,007	84,86	15,14
1995	0,045	0,040	0,005	88,16	11,84
1996	0,057	0,050	0,007	87,04	12,96
1997	0,053	0,046	0,008	85,58	14,43
1998	0,071	0,058	0,013	81,26	18,74
1999	0,072	0,050	0,022	69,13	30,87
2000	0,071	0,045	0,026	63,45	36,55

b) Cluster 2. Investment banks

	Theil index			Percentage over total Theil index	
	Total	*Within country*	*Between country*	*Within country*	*Between country*
1993	0,096	0,072	0,024	74,87	25,13
1994	0,134	0,080	0,053	59,97	40,03
1995	0,123	0,084	0,040	67,83	32,17
1996	0,157	0,122	0,035	77,87	22,14
1997	0,112	0,082	0,030	73,02	26,98
1998	0,124	0,088	0,036	70,84	29,16
1999	0,124	0,096	0,028	77,42	22,58
2000	0,174	0,154	0,021	88,13	11,87

c) Cluster 3. Universal banks

	Theil index			Percentage over total Theil index	
	Total	*Within country*	*Between country*	*Within country*	*Between country*
1993	0,121	0,081	0,040	66,91	33,09
1994	0,115	0,067	0,048	58,40	41,60
1995	0,092	0,059	0,033	64,14	35,86
1996	0,091	0,056	0,036	60,91	39,09
1997	0,101	0,067	0,034	66,40	33,60
1998	0,075	0,037	0,039	48,94	51,06
1999	0,106	0,044	0,061	42,04	57,96
2000	0,133	0,045	0,088	33,75	66,24

d) Cluster 4. Specialised banks

	Theil index			Percentage over total Theil index	
	Total	*Within country*	*Between country*	*Within country*	*Between country*
1993	0,084	0,070	0,014	83,04	16,96
1994	0,071	0,058	0,013	82,04	17,96
1995	0,074	0,059	0,014	80,56	19,44
1996	0,082	0,071	0,011	86,55	13,45
1997	0,068	0,059	0,008	87,51	12,49
1998	0,084	0,074	0,009	88,79	11,21
1999	0,098	0,072	0,026	73,92	26,08
2000	0,110	0,089	0,021	81,04	18,95

Source: BankScope (Bureau Van Dijk).

5. Conclusions

The progress of financial integration in Europe is undeniable, but unequal. Some of its more visible results can be seen in the reduction of interest rates -associated with the reduction in inflation and with the rest of the nominal convergence objectives with which the road to monetary union was paved- and in the convergence of the interest rates in the public debt markets and in the markets of the most standardised banking products (time deposits and mortgage loans to households). Less conclusive are the results in the retail banking markets in which the direct relationships with the client make several of the defining characteristics of the banking activity more relevant but also where the differentiation of the services and control of market power are more easily obtained.

The analysis of the relative margins of banking companies also indicates that margins are higher in retail banking. Given that the margins are obtained as a differential between prices and marginal costs, there might appear to be greater costs in the margins if the effects on the interest rates associated with the peculiarities of the banking operations *with clients* have not previously been discounted. If dealing with operation costs, then this would in fact be the case, and the levels and trajectories of the margins would confirm that market power exits and is maintained. However, if we consider it possible that such costs (information and supervision costs, idiosyncratic risks of the clients and of the operations) are not computed by the estimated cost function and that they will appear as a risk cost *ex post*, in the last rows of the profit and loss accounts, the doubts surrounding the cause of the behaviour of the margins remain, as an increase of margins does not necessarily imply a reduction in competition.

In any case, the fact that margin inequality is due in no small measure to differences between countries and that this inequality is even greater within those groups whose specialisation is more orientated towards retail banking would tend to indicate that entry barriers between the different national banking systems continue to exist, derived of regulations, cultural differences or of the strengthening of customer relations by means of sentiments of national identity. This implies that in order for any potential results of financial integration to appear it will be necessary not only to progress in the homogenisation of regulation frameworks but also in other areas of integration which are not strictly speaking economic.

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