INTEGRATING EUROPE'S RETAIL BANKING MARKET

INTEGRATING EUROPE'S RETAIL BANKING MARKET: WHERE DO WE STAND?

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1.   Introduction

The creation of a single *retail* banking market in Europe has recently become the focal point of the European single market project. An obvious reason for this increased attention is that integration has so far fallen short of expectations, which is partly owing to the well-documented slow progress in the integration of the retail banking market.[1] While the integration of other financial markets, such as bond, equity or wholesale banking markets, has been rapid – especially given that the introduction of the single currency has eliminated exchange rate risks within the eurozone – the currently emerging consensus is that retail banking markets have been disappointingly slow to change. Some of the disappointment may be rooted in exaggerated expectations, originating not at least from the estimates in the Cecchini report of the costs of 'non-Europe' (European Commission, 1988). Many academic observers assert that these estimates were excessive and that they were put forward "with a total lack of academic rigor" (Freixas, 2003, p. 1). Moreover, it is increasingly argued that the original ideas for creating a single market rested too much on the hope of obtaining economies of scale while giving too little emphasis to the role of competition and free market entry (see e.g. Sapir et al. 2004; Delgado, 2006). Although this position is often voiced with respect to the entire single market project, it is more relevant with respect to retail banking, where economies of scale are much harder to find. A more fundamental reason for the renewed focus on retail banking is that integration is not simply an objective in itself but a principal means to create an efficient European financial system, which is considered a key stimulant for economic growth and productivity as envisaged in the Lisbon agenda.

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[1] Recent overview assessments are given by Baele et al. (2004), Barros et al. (2005), Walkner & Raes (2005) and the annual *Financial Integration Monitor* (European Commission, 2004, 2005a, 2006a).

The CEPS Task Force on the Internal Market for Retail Financial Services was established to develop constructive proposals for the completion of a genuine market for retail financial services within the European Union (EU) with the ultimate goals of advancing the Lisbon growth and productivity agenda and of improving the quality and access to financial services (CEPS, 2005). As part of the work of this Task Force, the present report has been produced as a background paper reviewing the academic evidence on integration in the retail banking market.

2. The academic evidence on the integration of the retail banking market

The majority of academic observers agree that retail banking still represents the most segmented financial market in Europe. The existing evidence generally confirms this view. Nevertheless, the appropriate measurement and benchmarking of banking market integration are crucial to avoid jumping too quickly to incorrect policy conclusions. More specifically, some commonly-used integration indicators should be interpreted with caution as they may wrongly encourage 'over-harmonisation' while at the same time understate the role of competition and broad-based financial development policies. What do popular indicators reveal, what are their limitations and what do alternative measures say about the state of integration in the retail banking market?

Quantity-based indicators

Quantity-based indicators directly measure cross-border activities. These indicators, especially the numbers of mergers and acquisitions and the volume of cross-border loans and deposits, tend to show comparatively low levels of these activities. This situation is widely viewed as a sign of limited integration. This assessment is correct in general, but it is important to realise the limitations of these indicators: in fact, the absence of cross-border activity could itself signal that an integrated market has already been achieved. For example, if prices for petrol are the same across Europe, no one will travel across the border anymore to fill their car tank. Conversely, the very recent wave of cross-border mergers is often interpreted as a sign that integration is gaining momentum. Although that may be true, this wave might also simply reflect the fact that banks are just about to discover the benefits of cross-border activities in a still highly

fragmented market. Thus, measures that focus solely on flows rather than on stocks may paint the wrong picture. For example, Schoenmaker & van Laecke (2006, p. 1) calculate a transnationality index for banking to assess the state of cross-border banking and arrive at the conclusion that "European banking is finally arriving". Still, their study looks at the overall banking business. Whether the current state of Europeanisation of banking will be sufficient to create a single market for retail banking, given the peculiarities in this sub-sector of the industry, remains to be seen. Hence, quantity-based measures are difficult to interpret and need (at least) to be complemented by other indicators.

Price-based indicators

Are price-based indicators, i.e. indicators using retail interest rates, the better indicators of integration? The answer is a 'definite maybe'! First, similar prices will only tell us something about market integration when they relate to comparable goods. German apples that carry the same price tag as French oranges will not signal a single European fruit market. As retail banking products are still quite diverse, not to mention divergences in statistical reporting across Europe, the 'law of one price' may not tell us much about integration. Moreover, even if the products were homogeneous, prices can and should differ when there are differences in the underlying risks. It is therefore unimportant whether or not nominal returns equalise or converge. In an integrated market only the risk-adjusted returns should be equal. Unfortunately, the available data on retail interest rates are not sufficiently homogenised. Furthermore, while it is possible to calculate risk-adjusted returns in financial markets (see e.g. Flood & Rose, 2004), risk measures are not easily obtainable in retail banking markets. Interest-rate convergence indicators are nonetheless used regularly to assess the state of integration.[2] They reveal that nominal interest rate convergence has taken place mainly for corporate loans and mortgages and that the convergence – at least within the eurozone – was most pronounced in the late 1990s. The main driver of this process was the convergence of market interest rates in bonds and money markets. While the available price-based measures may thus indicate some convergence, simple nominal interest-rate convergence should not be misread as integration and vice versa! A case in point is the mortgage market, where rates often show a

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[2] See for example the annual *Financial Integration Monitor* of the European Commission (European Commission, 2004, 2005a, 2006a).

high degree of convergence despite a largely fragmented market. Retail interest rates are, however, useful indicators of integration as they can tell us to what extent prices are driven by specifically national or regional factors and to what extent they are driven by common factors. If national interest rates react similarly to shocks in common factors and therefore exhibit a certain degree of co-movement over time, this can suggest integration. As one type of news-based indicator, one can use cointegration analysis to investigate such long-term co-movements. These more reliable analyses typically reach the following findings:

- The level of integration in the retail banking market is generally still low.

- In lending, the degree of integration is highest in lending to corporations. There is some integration in mortgage lending. The lowest level of integration is found in consumer credit.

- On the deposit side, most of the evidence of integration is present in the more competitive market for time deposits, while demand and savings deposits show only very limited – if any – signs of integration.

- The introduction of the euro appears to have exercised a marginally positive effect on integration.

These results are in line with theoretical expectations. Markets where competition is strong are more integrated – be it because of strong competition within a country's retail banking system or because of alternatives made available by market-based financial services (e.g. money market funds instead of time deposits), owing to low switching costs (time versus demand deposits) and fewer information asymmetry problems (for mortgages as opposed to consumer credits) or to low barriers to (foreign) entry. These analyses may be better suited to assess market integration, but they generally suffer from data availability problems and are neither always readily available nor always fully reliable. Cointegration analyses hence provide additional insights but they need to be complemented with other analyses.

Convergence of real interest rates

Finally, one may look at real interest rates, which reflect the real returns on assets and the real financing costs of firms. In a fully integrated economy,

real interest-rate equalisation would be the strongest test for integration, but it requires simultaneous goods and financial market integration. Not surprisingly, given the substantial differentials in inflation rates, especially in the eurozone after the initial inflation convergence prior to 1999 under the influence of the Maastricht convergence criteria, real interest rates have shown no further convergence but rather some degree of divergence since then. Different degrees of integration of product and financial markets should as such remain a concern for policy-makers, which may need to be addressed simultaneously. Retail banking markets in Europe thus appear to fail this ultimate test for integration.

Given the limitations of quantity- and price-based measures of integration, it is important to measure whether integration has achieved its objectives. Therefore, regular in-depth analyses of competition in retail banking such as the recent sector enquiry by the European Commission's DG Competition (European Commission, 2006b) are highly welcome. These analyses typically use a large set of indicators on market structure, concentration, performance and conduct, as well as on barriers to entry. In this report some of the key findings of competition analyses are reviewed and extended.

Competition

The European Commission's enquiry perceives competition and efficiency as essential elements for the EU's single market project. The evidence presented points to limitations in competition and the existence of barriers to entry. The entry of foreign banks is nevertheless expected to have pro-competitive effects, inducing domestic banks to compete and improve their services. Additionally, the mobility of customers can enhance the competitive nature of a market. Yet market characteristics differ not only across countries but also across regions within countries. Consequently, market entry and competition will remain vital to achieving growth-enhancing, efficient European banking markets.

Global versus regional integration: Benchmarking European integration

Without proper benchmarking, the impact of changes in the global banking business induced by technological and financial innovation along with general deregulation can easily be misread as a success or failure of regional integration policies. This point can be illustrated by intermediation margins. These margins have generally gone down in Europe and

converged over the past decade. While this trend can be read as a sign of a more competitive and integrated European market, financial markets are also developing and integrating on a global scale. With proper benchmarking it can be shown that the margin convergence that is specific to the eurozone and which cannot be attributed to global factors can only be found for corporate loans prior to 1999. In contrast, mortgages even show signs of divergence since 1999.

Interest rate pass-through

Interest rate pass-through analyses can complement traditional competition analyses as they reveal how quickly and completely retail interest rates adjust to changes in policy or market interest rates. A limited pass-through points to market imperfections in retail banking. A heterogeneous pass-through across countries reveals a limited institutional convergence process that works against the law of one price. At least in the eurozone the disappearance of exchange rate risks has led to a largely integrated wholesale market where the law of one price applies. Remaining price differentials for identical retail products thus reflect differing degrees of competition. The pass-through results are generally consistent with the cointegration results mentioned earlier and reveal that:

- The pass-through in the short-term corporate lending market is faster and more homogeneous than it is in other lending markets.
- In the eurozone, particularly mortgage and consumer lending rates show a highly heterogeneous response to monetary policy.
- In the new member states the pass-through is typically faster, more complete and more uniform than it is in the eurozone, but these properties still differ as they are strongly influenced by the state of competition and the relative importance of foreign bank participation.
- Most integration effects to date have been achieved by integrating wholesale markets and not by integrating retail markets.
- An integrated wholesale market that equalises the cost of funds for banks plus a competitive retail market would be sufficient to equalise risk-adjusted returns and could in turn produce the very outcomes that one would expect from an integrated market. Consequently, increased integration effects can come from three sources:
  - the further integration of wholesale markets;

- – an extension of the eurozone, especially with respect to the new member states; and
- – increased competition in the retail banking markets.

In sum, the academic evidence clearly indicates that integration in the retail banking market is limited in Europe. That being said, some integrating effects have been achieved in the eurozone. These effects were most pronounced in the run-up to the monetary union and shortly thereafter. In more recent years, integration seems to have lost momentum. The strongest integration effects are concentrated on those products where the highest degree of competition within the banking sector and from outside the banking sector (such as from arm's length finance) can be found. Moreover, the integration of wholesale markets appears to be a major driving force for integration, but only in conjunction with a competitive environment.

3. Why have retail banking markets been so resistant to integration?

Two answers can be given to this question. One the one hand, it is more difficult to create a level playing field in retail banking than it is in other financial markets. On the other hand, there are economic and political reasons that work against full integration, so it is crucial to understand how retail banking differs from other goods or service markets:

- As integration in the wholesale banking market is a major driver of integration in retail banking, a lack of integration in wholesale banking along with nationally fragmented payment systems in particular, are potentially significant obstacles to integration in retail banking.
- As deposit-taking and lending activities involve default risks and are plagued by information asymmetries, credit rationing may occur and forms of relationship banking can easily develop, making retail banking a highly localised activity where proximity to the customer may create competitive advantages for incumbent banks. Thus, barriers to entry to a foreign retail banking market are high.
- Retail banking often involves high switching costs, i.e. where changing a bank imposes high costs on the customer, reinforcing long-lasting bank–customer relationships and in turn barriers to entry.

- The banking business is fragile by nature and prone to systemic (default) risk. As such, it requires regulation and supervision. In Europe, these tasks are assigned to national authorities, a structure that may lead to actual or perceived barriers to entry.

- Banking is important in financing economic activity and impacts on other sectors as well as on overall economic performance. National policy-makers therefore often view banking as a strategic sector and a major means for influencing economic development.

To summarise, when assessing the state of integration in the retail banking market one needs to understand and clarify how far integration in retail banking can go and how far it should go. Such an understanding should help to find a new balance between integration and competition policy with a strong focus on creating a highly efficient retail banking market.

4. The future of integration in the retail banking market in Europe

Several propositions can be made regarding the future of the retail banking market in Europe:

- European financial market integration is just about to start. It can and it will go further and both internal market and competition policies can be of assistance.

- Integration can proceed by means of not only cross-border mergers and acquisitions, cross-border lending and deposit-taking, but also by low(er) barriers to market entry, market contestability in general and a competitive domestic environment more specifically. In this respect, openness to extra-regional markets can also lead to more competition.

- Integration will ultimately be limited by the localised nature of retail banking. It is essential to recognise the limits of integration to avoid overburdening the internal market regulation.[3]

- The economic limits of retail banking integration provide diversification opportunities for banks' loan portfolios as risk and return differ across national banking markets. This suggests that in the coming years the efficiency and growth-enhancing role of retail banking can be improved. To achieve this, three more inputs seem to be important:

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[3] See also Barros et al. (2005).

- Competition and competition policy in national markets are vital, as price stickiness is still a substantial feature of European retail banking.

- It can be argued that the single market programme has possibly been built too much on the logic of achieving economies of scale, both in general and in particular with respect to retail banking, where the evidence of scale economies is at best mixed. Thus, competition policies, which help to create and maintain open banking markets, are fundamental.

- It is not only crucial how the banking market itself develops, but also how the capital markets in Europe evolve as this will eventually have a positive impact on bank intermediation.

- The integration process so far has been largely driven by wholesale market integration, which in turn was spurred by monetary integration. In this regard, three further elements are central to greater integration in the retail banking market:

  - extension of the eurozone;

  - the creation of the single European payments area (SEPA); and

  - further progress towards an integrated European capital market, which has recently seen rapid development (Casey & Lannoo, 2005). Experience in the United States indicates that the integration process can be accelerated by fast-evolving secondary credit markets and securitisation, but can also imply tremendous risks for financial stability.

In sum, a broad-based perspective on financial market integration that looks at the joint development of retail and capital markets is the key to further retail banking integration. This viewpoint, however, requires a strong focus on competition in retail banking without compromising financial stability in order to obtain the much sought-after growth benefits from an integrated retail banking market.

1. INTRODUCTION

Why do we want an integrated market?

For an initial answer to this question, it is worth recalling that the motivation for regional integration in Europe has always been political, eventually even aiming at the creation of a 'United States of Europe', as advocated by Jean Monnet. The means to achieve that objective have always been economic, however. The Treaty of Rome of 1957 identifies in Article 2 the creation of a unified economic area with a common market as the task of the Community. Thus, the quest for a single European banking market could be understood as a vital part of the European integration project. Nevertheless, integration is not simply an objective in itself but is essentially also an important means to deliver economic benefits.

This point was implicitly contained in the original Cecchini report (European Commission, 1988). According to this report, financial integration should cause prices of financial services in many European countries to fall by 25% by converging to the prices of the lowest-cost supplier. Integrated banking markets should deliver benefits by reducing costs and increasing benefits for all retail banking customers. Integration in retail banking can hence be viewed as a *means to improve the efficiency of the financial service sector* by providing consumers with the best savings opportunities and giving small and medium-size enterprises (SMEs) access to deep and liquid markets for raising capital.

Moreover, there is now an emerging consensus among many observers, including the European Commission, that "an efficient and integrated European financial market will help to support growth and job creation within a competitive economy", as envisaged in the Lisbon agenda (European Commission, 2001, p. 15). In this context, retail banking can be viewed as a key sector that can help to promote a growth-enhancing integration of other product and service markets. Financial integration is therefore a significant *means to enhance economic growth*. Finally, the integration of financial and banking markets helps to reduce asymmetries in the retail interest rates faced in the various eurozone countries even in

the presence of a single monetary policy. As such, financial integration can also be a *means to harmonise the impact of monetary policy*.

What regulatory progress has been made?

In practice, the objectives of integration and economic development have always been inseparable, as was already evident in the Treaty of Rome. With respect to the creation of a single market for financial services, next to the 1957 Treaty of Rome key regulatory milestones include the 1977 First Banking Directive, the 1985 Second Banking Directive, the 1992 Maastricht Treaty and the 1999 Financial Services Action Plan. Dermine (2003) argues that each of them characterises a new phase in Europe's legal environment: deregulating entry (1957–73), the harmonisation of banking regulations (1973–83), the completion of the internal market (1983–92), the creation of the single currency (1999) and the Financial Services Action Plan (1999–2005). Regarding the importance of the European monetary union (EMU), as Tommaso Padoa-Schioppa (2000, p. 2) from the board of the European Central Bank (ECB) argues, "multiplicity of currencies in the single market was a fundamental factor behind the preservation of the segmentation of the banking industry" and "it is indeed the existence of a single currency and a single central bank which very often unifies a banking system".

By now, there is widespread consensus among policy-makers and academics that despite these regulatory efforts European retail banking integration is lagging behind the ultimate objective of providing a single market for financial services for Europe. For example, as Freixas (2003, p. 1) concludes, "[b]arriers to entry are still today's most relevant challenge of European financial integration". Differences in objectives between European and national regulators (just witness ABN-Amro's struggle to obtain the controlling share in Italy's Antonveneta in September 2005) as well as the persistence of non-regulatory barriers to integration continue to exist. The former has led the European Commission (2005b) to publish a Green Paper on financial service policies over the period 2005–10. The focus now lies on implementing existing rules rather than creating new ones.[4]

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[4] For example, after realising the slow progress in the integration of the retail banking market, which is at least partly caused by a fragmentation of the national regulation of financial products in the 25 EU member countries, the Commission is

How much can regulation achieve?

While regulatory barriers can be addressed by policy-makers, non-regulatory barriers cannot. It is thus essential to take the latter properly into account. In retail banking, trust and confidence are key considerations for a customer when choosing a bank. Hence, knowledge of the bank and the national legal system will create differentiated banking products and cultural differences in consumer behaviour. Moreover, banking typically suffers from asymmetric information problems, i.e. the borrower has better knowledge about his or her capacity to repay than the lender. To the extent that local or national knowledge reduces this information asymmetry, local lenders might have an advantage over foreign lenders. Particularly retail services, such as relationship lending to SMEs, might always be provided by local banks that best understand the local market, language and culture and which have superior information about local businesses.

In a market where proximity to customers remains fundamental even in an age of modern distribution technology, legal integration may be insufficient to create full market integration. As argued by Berger (2003, p. 40) in a study on global integration in the banking industry, "despite…reduced barriers, the integration of the banking industry in most developed countries has fallen far short of the expectations of many observers". As a major reason for this Berger holds that "foreign banking organizations may be at significant competitive disadvantage in providing the price, quality and mix of services that best suit bank customers, and that such disadvantages may limit the integration of the banking industry". Clear exceptions are countries with an underdeveloped banking system. As such it is not surprising that foreign bank penetration is mostly found in the new member states (NMS) and that European mergers and acquisitions (M&As) are more often than not motivated by gaining better access to Central and Eastern European banking markets, while cross-border M&As have been the exception rather than the rule across the old member states of the European Union (EU-15).

What are the implications for the measurement of integration?

Whereas the distinction of an integrated retail banking market as a means or an end is of course somewhat academic, it helps to clarify and categorise

considering the idea of creating a 26th regime, i.e. to grant specific financial products (i.e. mortgages) a special European status.

objectives and their measurement. If integration is an objective in itself, measures of cross-border activities provide the most appropriate indicators. In this sense, M&As or cross-border deposit-taking and lending would in themselves be welcomed signs of integration. If integration is considered a means to create a more efficient retail banking market, indicators of the efficiency of the retail banking systems come to the fore. If the retail banking market is considered a means to promote growth, even more broadly based analyses of financial system development may be called for. We therefore regard banking market integration as one but not the only *means to create an efficient, stable and growth-enhancing financial sector* in Europe. This view allows us to review the *opportunities* and the *limits* of retail banking market integration as well as identify *policy alternatives*.

2. INTEGRATING EUROPE'S RETAIL BANKING MARKET: WHERE DO WE STAND?

2.1   European financial markets: State and development

Banks have always played an important role in Europe's financial system. Historically, the European banking system developed from the unit-based banking system of the 17th and 18th centuries to the early 19th century's bi-polar system consisting of town-based banks financing domestic and international trade and country-based banks financing the local, predominantly agricultural economy. By the end of the 19th century, most European countries had a nationwide branch system. The competition between country-based (regional) banks and town-based (national) banks differed across countries and led to the heterogeneity still found in European banking today. Furthermore, the relationship between industry and banks also shaped the market. Whereas in the United Kingdom (UK), banks financed mostly trade and to a lesser extent industry, the ties between industry and banks were much closer in Continental Europe. Consequently, the UK developed a more market-oriented financial system while the Continental European system became mainly bank-oriented.

Yet in general bank lending plays a dominant role in providing funds to the corporate, private and public sectors throughout Europe. As Table 2.1 shows, bank credits amounted on average to 109.2% of the gross domestic product (GDP) in the 25 member states of the EU (EU-25) from 1995 and 2004. This share, however, reflects the significance of bank lending in the old member states of the EU, where the level of 114.6% is much higher than the 35.6% of the new member states (NMS). For comparison, the 2001 level in the United States (US) was only 40.7% and in Japan it was 79.7%. Retail banking accounts for 50% of total EU banking and is thus the leading banking sub-sector. In 2006, across the EU there were more than 8,000

credit institutions active in retail banking. In 2004, they contributed about 2.5% to the EU's GDP owing to €250–275 billion in gross income (European Commission, 2006b). Market-based forms of funding, and here in particular bond finance, are used to a lesser extent in the EU-15, where bank finance amounts to a substantial 33% of European firms' financing sources (European Commission, 2004) while equity and bond market capitalisation amount to only 53% and 123% of GDP compared with 147% and 149% in the US, respectively (Fonteyne, 2006).

The situation in the NMS is much less clear. Although financial development indicators still signal underdevelopment in all three areas, it nonetheless appears that in many countries the banking system is relatively more important than the other sources of finance, though the situation differs from country to country. Moreover, banking is rapidly evolving in the NMS, not the least because of an increasing influx of foreign direct investment into the NMS banking systems in recent years.

The view of continental Europe as dominated by a bank-based system may, however, be drawn with too broad a brush. For obvious reasons this is evident in the transition countries of the NMS where banking is still underdeveloped. From Table 2.1 it appears that we can roughly distinguish two groups of countries: in Estonia, Hungary, Latvia and Slovenia, households and firms have somewhat better access to finance. By contrast, in Lithuania, Poland, the Slovak Republic and the Czech Republic they have more limited access to finance. In the latter country, access to credit has even decreased since 1997. Whereas credit growth can have positive effects (financial deepening) as well as negative ones (mispricing of risk under excessive credit growth), it is generally agreed that the observed credit growth in these transition economies of the NMS reflects financial deepening. This trend can be compared with the credit growth observed in Greece, Ireland or Portugal prior to 1999 (EBRD, 2005). But even within the EU-15, the significance of banking in terms of bank assets, credit granting and deposit-taking varies considerably across countries, from Germany on the one hand to Finland and Italy on the other.

Table 2.1 Total assets, credit and deposits of domestic European credit institutions

Country	Total assets as a % of GDP		Total credit as a % of GDP		Total deposits as a % of GDP	
	Average 1995–2004	2004	Average 1995–2004	2004	Average 1995–2004	2004
EU-25	*227.7*	*215.1*	*109.2*	*114.5*	*86.3*	*94.3*
EU-15	*235.3*	*219.1*	*114.6*	*119.9*	*89.5*	*96.9*
Austria	243.2	268.0	118.1	125.1	95.3	97.9
Belgium	302.8	322.3	98.5	107.2	119.0	142.8
Denmark [b)]	233.6	309.3	143.2	164.4	54.9	62.2
Finland	111.3	141.9	60.1	69.4	54.5	53.2
France	234.7	267.9	93.3	92.9	72.8	77.0
Germany [a), b)]	246.6	295.5	187.6	135.8	103.5	113.3
Greece	129.9	137.9	51.0	76.4	86.1	95.6
Ireland	314.3	486.4	125.9	176.2	109.9	122.7
Italy	152.6	168.4	85.3	88.0	58.9	58.0
Luxembourg [b), c)]	3,040.8	2,708.5	593.2	467.3	1,021.2	859.4
Netherlands	270.1	243.3	144.5	174.1	111.0	122.4
Portugal	207.4	242.5	113.7	136.8	104.2	102.2
Spain	181.3	205.0	103.2	120.6	96.6	104.4
Sweden	175.4	208.9	106.4	114.5	47.2	151.2
UK	332.8	406.4	133.6	142.2	103.6	117.6

Table 2.1, cont.

NMS	*76.2*	*84.7*	*35.6*	*41.9*	*43.3*	*50.6*
Cyprus	240.8	305.9	109.5	141.1	109.8	126.8
Czech Republic	120.9	99.7	54.2	38.7	61.5	69.2
Estonia	62.5	94.4	29.4	65.4	30.4	45.8
Hungary	57.4	80.1	29.7	48.3	41.5	44.4
Latvia	60.9	101.3	20.1	56.5	32.3	65.7
Lithuania	31.3	47.5	14.1	30.4	18.2	30.1
Malta	273.9	476.8	129.5	200.1	155.1	204.9
Poland	57.6	67.6	25.3	34.8	35.5	45.6
Slovak Republic	92.3	87.7	44.1	36.3	41.2	21.7
Slovenia	72.3	93.6	33.4	47.3	45.8	56.7

[a] Total assets refer to 2003.

[b] Total credit refers to 1997 to 2004.

[c] Total deposits refer to 1997 to 2004.

Note: EU-25, EU-15 and NMS averages are purchasing power parity, GDP-weighted.

Source: Data for total assets, total credit and total deposits are from Allen et al. (2005).

In addition, data for the more market-based financial system of the UK also reveal also a high importance of banking. In a similar vein, Fonteyne (2006) argues that in the US, banking is no less critical than in the EU, at least when measured in terms of lending to the private sector. The differences in the numbers stem from the fact that US banks securitise a much higher share of their loans (particularly mortgages). Consequently, these lending activities do not appear in the balance sheets of banks and they are mostly excluded from the much-quoted credit-to-GDP figures. When including securitised loans, Fonteyne reports for 2004 higher levels of bank loans to the non-financial sector for the US than for the EU, which totalled 118% of GDP in the US compared with 92% in the EU.

In sum, it becomes evident that the view of a European bank-based financial system as opposed to a US market-based system is too simple. In Europe, both bank-based and market-based financial systems may have a strong development potential in the future with an especially relevant role for the interaction of both systems.

2.2   Measuring integration and the efficiency of European retail banking

A common definition of an integrated market highlights that in such a market, consumers and producers have equal opportunities regardless of their country of origin. Integration in retail banking should provide individuals with the best saving opportunities and give companies access to deep and liquid markets for raising capital. A unified market is expected to broaden choice and lower prices for financial services. In an influential study, Adam et al. (2002, p. 4) state, "[f]inancial markets are integrated when the law of one price holds". As such, identical assets should sell at one single price regardless of the domicile of the consumer or producer of that financial asset. An identical product, priced differently across countries, would point to the presence of legal or economic barriers (or both) to a free flow of financial services across borders and indicate the existence of unexploited arbitrage opportunities.

The argument of the Cecchini study (European Commission, 1988) for creating a single European market was based on the law of one price (LOOP) as the point of reference for market integration. According to this view, *gains from trade* should materialise as an increase in consumer rents when markets are integrating and prices are falling. More precisely, the

Cecchini study predicted that post-integration prices would fall to a level equal to the prices of the country with the lowest pre-integration prices. Gardener & Teppett (1995) estimated that these price reductions ranged from 21% to 4% for the different member countries with an average reduction of 11%. They were expected to result in a total gain in consumer surplus of ECU 21.6 billion for the then eight member states: Belgium, Germany, Spain, France, Italy and Luxembourg, the Netherlands and the UK. Accordingly, consumer rents would increase not only because consumers would obtain access to least-cost suppliers but also because a larger unified market could allow for substantial economies of scale. In fact, the single market programme was mainly driven by the quest for scale economies. In this almost 'textbook view', the integration of markets would allow the creation of larger corporations, e.g. by means of M&As, which could achieve major cost reductions. The theoretical prediction then is that the total number of corporations in the integrated market would be reduced. Given that these companies would then be present in all countries, consumers would benefit from a greater choice and lower prices because of stronger competition. What is more, the realised scale economies could also enable European companies to become stronger in global competition.

While this logic is now increasingly questioned even with respect to product markets (see for example Delgado, 2006), it is yet more questionable with respect to retail banking markets where the evidence concerning economies of scale is at best mixed. In the 1980s, there was some evidence of firm-specific economies of scale only for very small banks, i.e. banks with less than $100 million in deposits (Clark, 1988). In later research, the evidence in favour of scale economies remained elusive (Piloff & Santomero, 1998; Calomiris & Karceski, 1998; Rhoades, 1998). More recently, Walter (2006) confirms these findings and conjectures that differences in bank operating efficiency generally tend to dominate scale economies in financial services. As a consequence, M&As may not deliver the expected scale economies but at best a once-and-for-all reduction in inefficiencies. The role of M&As as a vehicle for integration may therefore be limited, and may work best where differences in operating efficiencies between the acquiring and the acquired institution are largest, such as in deals involving banks in the NMS.

When measuring integration according to the LOOP, the focus can be put on either the process or the state of integration. The process of integration can be studied directly by using *input measures* – cross-border M&As, cross-

border borrowing and deposit-taking and the like. The state of integration can be assessed by *output measures*, which reveal the results of a more or less efficient arbitrage process by looking at interest rate *convergence*.[5] These two measures are arguably the most popular ones (see the annual *Financial Integration Monitor* by the European Commission, 2004, 2005a, 2006a). The advantages of these measures are that they are easily available. Accordingly, we start our assessment of European retail banking integration by studying them.

These measures have their caveats, however. First, integration – (too) narrowly understood as cross-border M&As – is neither a necessary nor a sufficient condition for creating an efficient banking market. The *absence* of cross-border M&As can in fact signal the existence of an integrated market when integrated money or bond markets equalise the banks' cost of funds and competition or contestable markets ensure pricing based on these marginal costs. In such a market, there would be no motivation for cross-border M&As, lending or deposit-taking. Second, the LOOP manifests itself in financial markets as the interest rate parity (IRP), which in its uncovered form is difficult to establish owing to exchange rate volatility or exchange rate expectations. Whereas in the eurozone exchange rate risk is no longer a concern, that is not true for non-eurozone EU members. Third, price differences in retail markets may not only reflect legal barriers and regulatory differences that can be *harmonised away* but may also signify deeply rooted differences in financial structures, economic risks, information asymmetries and consumer preferences. Hence, retail banking prices may never fully equalise but only *move together*. We therefore proceed to investigate alternative measures of integration. Instead of convergence of nominal interest rate levels, we consider real interest rate convergence since, on the most fundamental level, economic theory predicts that real rates of interest on physical assets and in turn on financial

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[5] In this report, we focus on retail banking as lending to and deposit-taking from consumers and SMEs. Consequently, we are interested in interest rates as prices of loans and deposits. We are aware, however, that retail banking involves other activities such as payment processing and that interest rates may not always properly reflect the actual price. This point is particularly important with respect to current accounts, where banks commonly charge fees for various services. Note that gross income per account differs substantially from country to country, ranging in 2004 from a maximum of €265 in Luxembourg to a minimum of €15 in Lithuania (see Figure 18 of European Commission, 2006b).

assets will converge as economies integrate. Furthermore, we measure the co-movements of interest rates through cointegration analyses and contrast these findings with the results of our convergence analyses.

As we consider integration a means to promote retail banking efficiency, we additionally review various measures of competition and efficiency in order to obtain a broader and more complete picture of European retail banking integration. The first set of indicators measures bank performance, major features of the banking market and the impact that integration has on both. Second, as financial markets are also developing and integrating on a global scale, *benchmarking* is important. Without it, the impact of changes in the global banking business induced by technological and financial innovation along with general deregulation could be mistaken for a success or failure of regional integration policies. We thus present an analysis of intermediation margins in retail banking that separates global from regional effects. Third, measures of the so-called 'interest rate pass-through' can provide useful information.

They shed light on the competitive situation in retail banking as they reveal the banks' pricing behaviour. Generally speaking, competition is present when banks adjust retail interest rates quickly and fully in response to changes in market interest rates.

They convey information about the homogeneity of the response of various national banking systems to monetary policy impulses. This of course is in itself extremely valuable under the condition of a single monetary policy regime.

A homogeneous response across countries indicates the existence of an integrated retail banking market.

Finally, an efficient and well-developed financial sector is key to financing economic activities. As such, it is a major *means to enhance economic growth.* There exists a large body of literature on this nexus of financial development and economic growth. Financial development is obviously a broad concept that – rather than focusing on one sector in isolation – encompasses all aspects of the financial sector and the linkages between its sub-sectors. Banking is a fundamental element in the finance–growth nexus in particular because retail banking is the major source of external finance for SMEs. But rather than viewing retail banking in isolation, its development should be considered part of the whole financial sector's

development.[6] As such, financial sector integration may have the potential to contribute significantly to financial development but integration in retail banking can also make its own contribution. At the same time, the integration of other financial markets, especially wholesale markets, will have a substantial impact on retail banking efficiency and development. For example, integrated and thus larger money markets, corporate bond markets and secondary loan markets can contribute to improvements in the retail banking market. Therefore, we review attempts to measure the interaction between retail banking efficiency and financial development.

2.3 The current state of retail banking integration

2.3.1 Cross-border activities

Cross-border activities are quantitative measures of integration that reflect the channels of integration as illustrated in Table 2.2 and as such visualise integration as a result of cross-border M&As, the domestic activities of foreign-owned banks or foreign branches, or cross-border loans and deposits of domestic banks.

The surveys by Walkner & Raes (2005) as well as the annual *Financial Integration Monitors* (European Commission, 2004, 2005a, 2006a) provide the most recent evidence in this area. As Table 2.3 clearly indicates, the European banking market has undergone a period of consolidation in almost all countries. From 1995 to 2006, the number of credit institutions decreased on average by 7% in the EU-15 as well as in the eurozone, whereas the NMS showed a substantially higher decrease of 27%. The countries in this latter region typically experienced this drop in the number of banks at the end of the 1990s, while more recently bank numbers have been increasing again. Underlying these trends can be both domestic and cross-border bank mergers (most likely the case for the EU-15) as well as the entry of foreign banks (as in the case of the NMS).

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[6] See, for example, the recent attempt by the International Monetary Fund (2006) to construct a financial index to investigate – among other things – the role of financial development for retail banking efficiency. For a short discussion, see also section 2.4.4 in this report.

Table 2.2 Financial integration channels

Channel	Strategy	Tools
Bank-driven channel	Local ownership	Branches
		Subsidiaries
		Mergers and acquisitions
	Local intermediation	ATM
	Distribution	Internet
		Phone
		Credit card
Consumer-driven channel	Local purchase from a foreign-owned bank	
	Local purchase of a foreign product	
	Cross-border purchase	Diverse distribution channels
		Direct purchase abroad

Source: European Commission (2005a).

Nevertheless, as Figure 2.1 illustrates, the vast majority of M&As take place between two domestic banks. As Walkner & Raes (2005, p. 22) state, according to the available data, cross-border mergers and acquisitions have not been a major feature of the EU banking sector. In terms of numbers, mergers and acquisitions among domestic credit institutions represent about 80% of total consolidation activity in the EU in each year since 1992. The only clear pickup in cross-border mergers and acquisitions is evident in the run up to the creation of the single market in 1992, when the share of domestic mergers fell to about 60%. However, cross-border mergers and acquisitions have never come close to exceeding domestic mergers and acquisitions.

Table 2.3 Consolidation of the European banking market

Country	Number of credit institutions												Change (%)
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	
Austria	–	1,019	995	898	875	848	836	823	814	796	818	819	-20
Belgium	120	116	131	123	117	118	112	111	108	104	100	103	-14
Finland	349	347	348	348	346	341	369	369	366	363	363	363	4
France	–	–	1,258	1,226	1,158	1,099	1,050	989	939	897	854	842	-33
Germany	3,651	3,542	3,420	3,238	2,992	2,742	2,526	2,363	2,148	2,148	2,089	2,057	-44
Greece	39	41	55	59	57	57	61	61	59	62	62	62	59
Ireland	–	–	71	78	81	81	88	85	80	80	78	78	10
Italy	970	937	935	921	890	841	843	821	801	787	792	806	-17
Luxembourg	220	221	215	212	211	202	194	184	172	162	157	152	-31
Netherlands	744	658	648	634	616	586	561	539	481	461	401	367	-51
Portugal	257	243	238	227	224	218	212	202	200	197	186	181	-30
Spain	316	313	416	404	387	368	366	359	346	346	348	349	10
Denmark	204	203	213	212	210	210	203	178	203	202	197	190	-7
Sweden	116	175	237	223	212	211	149	216	222	212	200	206	78
UK	486	478	557	521	496	491	452	451	426	413	400	401	-17

Table 2.3, cont.

Cyprus	–	–	–	–	–	404	406	408	405	405	391	355	-12
Czech	55	53	50	45	42	119	96	83	77	74	56	56	2
Estonia	18	15	12	6	7	7	7	7	7	9	11	14	-22
Hungary	295	292	286	294	260	241	230	225	219	217	214	213	-28
Latvia	43	39	37	27	23	21	19	19	19	23	25	26	-40
Lithuania	17	26	37	42	48	52	53	68	71	74	77	77	353
Malta	–	–	–	–	–	22	17	14	16	16	19	18	-18
Poland	1,591	1,475	1,378	1,272	858	754	713	667	660	653	730	727	-54
Slovakia	33	29	29	27	25	23	23	22	21	21	23	24	-27
Slovenia	41	36	34	30	31	28	24	22	22	24	25	26	-37
Eurozone	6,666	7,437	8,730	8,368	7,954	7,501	7,218	6,906	6,514	6,403	6,248	6,179	-7
EU-15	7,472	8,293	9,737	9,324	8,872	8,413	8,022	7,751	7,365	7,230	7,045	6,976	-7
NMS	2,093	1,965	1,863	1,743	1,294	1,671	1,588	1,535	1,517	1,516	1,180	1,536	-27
EU-25	9,565	10,258	11,600	11,067	10,166	10,084	9,610	9,286	8,882	8,746	8,616	8,512	-11

Notes: The total number of credit institutions is calculated for the eurozone, EU-15, NMS and EU-25. The last column reports the percentage change in the number of banks between the first year for which data is available and 2006.

Sources: Country data for 1995 to 2004 are obtained from Table 5 in Allen et al. (2005). Country data for 2005 and 2006 have been obtained from the ECB's MFI statistics and represent the data for December 2005 and August 2006.

Figure 2.1 Mergers and acquisitions in European banking markets
Panel A: Number of domestic versus cross-border M&As among depository
institutions
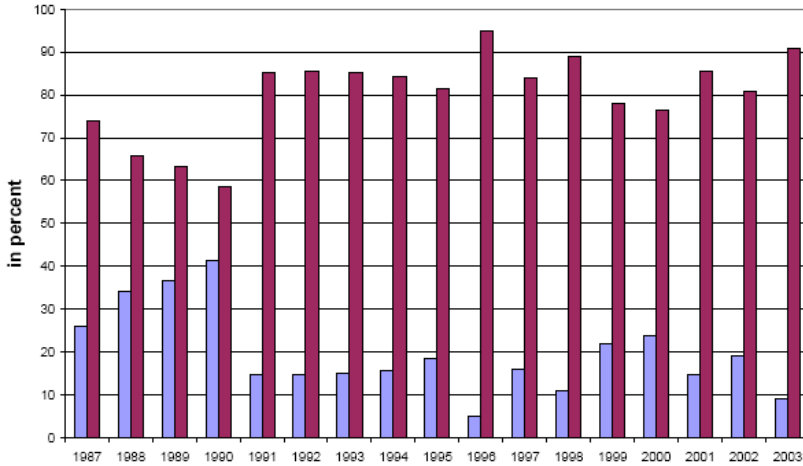
Panel B: Value of domestic versus cross-border M&As among depository
institutions
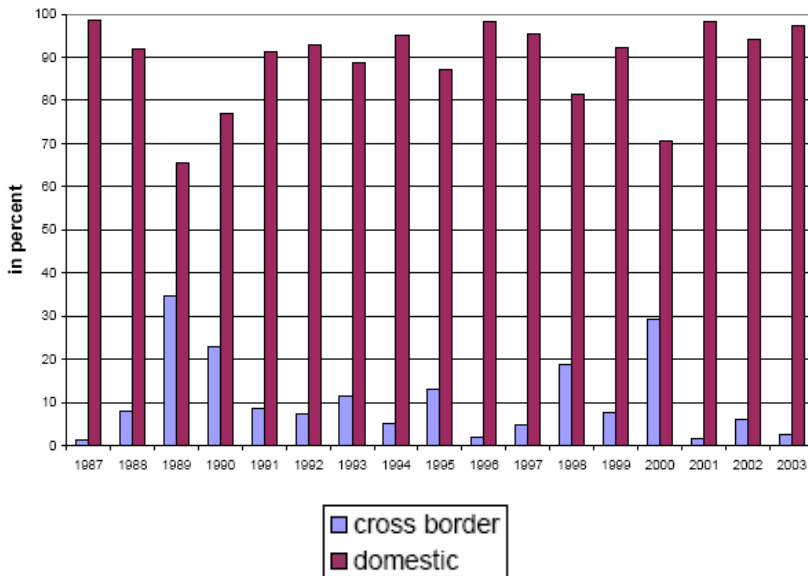
Source: Graphs 1 and 2 in Walkner & Raes (2005).

Very recently, however, cross-border M&As have been gaining momentum. In 2004, cross-border mergers accounted for less than 25% of the total number of bank mergers within the EU-25 but reflected approximately 80% of the total value (European Commission, 2006a). For example, the Dutch ING Bank bought German and Belgian banks. German HypoVereinsbank first acquired Austrian and NMS banks and has subsequently been bought by the Italian UniCredito. Spanish Santander took over the British Abbey National. Dutch ABN-Amro succeeded in buying the Italian Antonveneta and most recently the French BNP-Paribas bid for the Italian Banco Nazionale del Lavoro. Finally, Nordea Bank resulted from a merger of four Scandinavian banks. What makes this last case so interesting from an integration perspective is that Nordea established a single corporate structure using the status of a European company, aka Societas Europaea.

Yet looking at M&As can lead to wrong conclusions, as M&As reflect flow and not stock figures. While the former basically should react to unexploited profit possibilities, caused by fragmented markets or efficiency gains (or both), only stock figures give information about the *state* of integration. Building on this idea, Schoenmaker & van Laecke (2006) have recently calculated a transnationality index (TI) for banking. This index investigates the internationalisation of three indicators: assets (loans and securities), revenues and employment. Based on the achieved TI scores the authors classify banks as "domestic", "regional" or "international" and find that the number of predominantly European banks has increased from 7 in 2000 to 11 in 2005. They conclude that "European banking is finally arriving" (Schoenmaker & van Laecke, 2006, p. 1). As a driving force they identify that cross-border banking may follow a non-financial trade pattern.

Still, their analysis is based on overall banking activity and not solely on retail banking. Although it can be argued that this is a first step and retail banking might follow soon, the issue requires further investigation. So we also report some additional stock data on retail banking. Next to M&As, banks can also achieve a foreign presence through local ownership of subsidiaries or branches. As Figure 2.2 illustrates, the number of foreign branches of European Economic Area (EEA) banks in the EU slowly but steadily increased between 1997 and 2004. The number of subsidiaries nonetheless remained almost constant until 2003 and only increased in the most recent year. It is thus not surprising that the assets of these branches

and subsidiaries amount to just a small fraction in terms of GDP. That said, with the introduction of the Societas Europaea, the trend towards cross-border branching could eventually gain momentum in the future.

Figure 2.2 Market integration through local ownership and the asset share of foreign banks – Regional presence of foreign banks
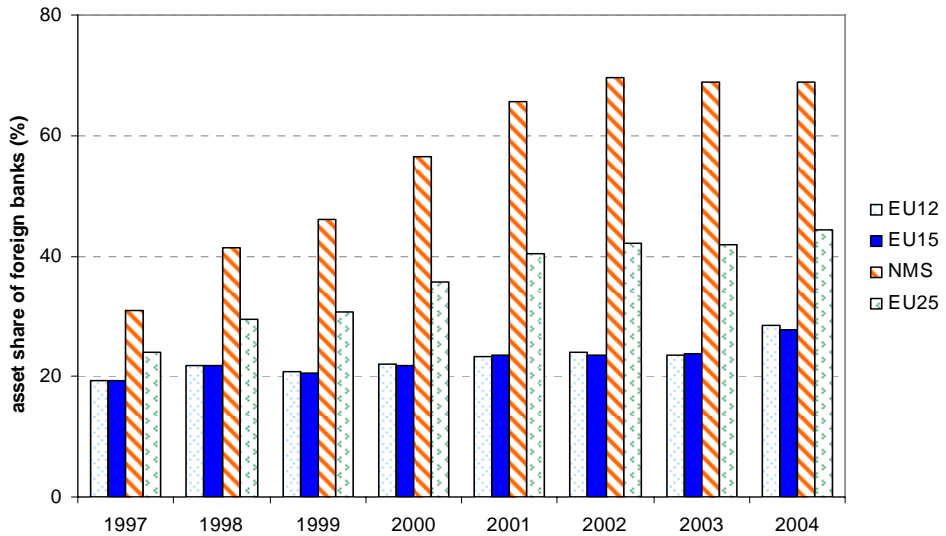
Notes: Figure 2.2 shows own calculations for the EU-12, EU-15, NMS and EU-25 as unweighted averages across member countries. Country-level data have been obtained from Table 7 in Allen et al. (2005), who report the share of foreign credit institutions as a percentage of total assets of domestic credit institutions.

Source: Table 7 in Allen et al. (2005) and own calculations.

Figure 2.2 might still understate the role of foreign banks in the NMS, where foreign banks contributed largely to the build-up of a financial infrastructure. As Table 2.4 reveals, the asset share of foreign banks is on average higher in the NMS than it is in either the eurozone (see the EU-12) or the EU-15. Exceptions are Finland and Sweden in the EU-15 and Cyprus, Slovenia and Slovakia in the NMS. Overall, the evidence supports the view voiced by Berger (2003) that there are powerful market forces favouring the local banking industry that may not easily be overcome by reducing entry barriers. In contrast, in less developed countries and particularly in transition countries, where financial systems have had to be built from scratch, the foreign banking industry can play an important role.

Table 2.4 Market integration through local ownership and the asset share of foreign banks – National presence of foreign banks (in percentages)

Country	Asset share of foreign banks								Change
	1997	1998	1999	2000	2001	2002	2003	2004	
Austria	3.4	2.7	2.7	2.8	19.4	21.4	19.6	19.4	471
Belgium	30.4	26.9	23.7	24.9	24.9	24.0	22.9	23.2	-24
Finland	8.4	8.2	9.5	8.1	6.8	9.1	7.4	59.5	608
France	10.4	9.9	11.3	15.0	9.6	12.7	11.1	11.4	10
Germany	4.3	4.3	4.0	4.1	4.7	6.1	6.0	6.3	47
Greece	15.8	12.7	11.0	11.6	8.8	21.7	22.0	24.8	57
Ireland	24.8	55.9	57.2	57.9	59.4	47.3	43.9	45.4	83
Italy	7.0	8.0	7.4	6.5	5.5	5.6	5.9	7.7	10
Luxembourg	92.5	94.5	94.5	92.2	94.6	93.7	93.9	94.1	2
Netherlands	7.2	6.5	5.2	11.2	11.3	10.3	11.8	12.1	68
Portugal	14.8	21.0	14.7	22.2	24.6	25.1	26.5	26.1	76
Spain	12.5	11.5	9.2	9.0	11.2	9.9	11.0	11.5	-8
Denmark	4.5	6.3	4.3	5.2	16.2	13.0	16.0	16.2	260
Sweden	2.5	4.4	3.6	5.4	5.8	6.6	7.6	8.7	248
UK	52.2	52.9	50.1	52.5	50.5	47.4	49.8	51.3	-2
Cyprus	10.2	10.9	11.3	11.7	12.8	12.7	12.3	30.1	195
Czech Rep.	24.0	26.0	39.0	75.4	93.3	94.2	95.9	91.8	283
Estonia	29.0	90.0	90.0	97.0	98.0	98.0	99.2	98.0	238
Hungary	53.0	64.0	66.4	68.1	70.0	90.7	83.0	77.0	45
Latvia	55.0	63.1	66.2	69.9	67.8	54.4	53.9	57.8	5
Lithuania	41.0	51.0	37.0	57.7	81.1	88.1	88.7	93.0	127
Malta	47.1	56.5	56.7	57.9	59.2	72.8	68.2	39.1	-17
Poland	15.3	16.6	47.2	69.5	68.7	67.4	67.8	67.6	342
Slovakia	30.0	30.0	31.0	43.0	90.5	95.6	96.3	97.0	223
Slovenia	5.0	4.8	15.3	15.6	15.6	23.1	24.2	38.0	660

Notes: These country-level data have been obtained from Table 7 in Allen et al. (2005), who report the share of foreign credit institutions as a percentage of total assets of domestic credit institutions.

Sources: Table 7 in Allen et al. (2005).

It is also possible for banks to penetrate a foreign market without being physically present. Figure 2.3 provides information regarding cross-border loans. It clearly shows that wholesale market integration is far more advanced than retail market integration. Looking first at interbank loans, Panel A reveals an increasing trend for eurozone loans and – to a somewhat lesser extent – for EU loans but a decreasing trend for other foreign interbank loans. Between 1999 and 2006, total cross-border interbank loans increased from about 65% to 80% with eurozone and EU interbank loans accounting for about 40% and 60%, respectively. It would thus appear that the European integration effort has not only stimulated wholesale integration but has also led banks to favour the eurozone interbank market at the expense of the non-EU interbank market. Panel B provides corresponding data for retail banking by focusing on cross-border loans to non-banks. In contrast to wholesale markets, there is little indication of retail integration. Cross-border loans – though steadily rising – only amounted to about 11.5% of total loans at the beginning of 2006, and EU and eurozone cross-border retail loans clearly lagged behind the global development. The results shown here are in line with the findings of other studies concerning cross-border loans as well as deposits to non-banks. Baele et al. (2004) for example argue that the slightly increasing trend towards more cross-border lending is mainly driven by non-eurozone banks.

Overall, we conclude from the cross-border activities of banks that the integration process is still slow (see also Cabral et al., 2002), at least in the retail markets of the EU-15 member countries. Yet this observation was also made when the US deregulated its banking market in the 1980s and 1990s by lifting the restrictions on interstate branching. Cross-border banking then made a slow start before finally gaining momentum. Nevertheless, US banking has to deal with much less fragmented legislation as well as a historically and culturally less diverse background than European banking does. In sum, the cross-border banking evidence is often interpreted as pointing to a still-fragmented retail banking market in Europe, which, however, also indicates that the integration process is slowly gaining ground.

Figure 2.3 Cross-border penetrations of banks in the eurozone
Panel A: Cross-border interbank loans
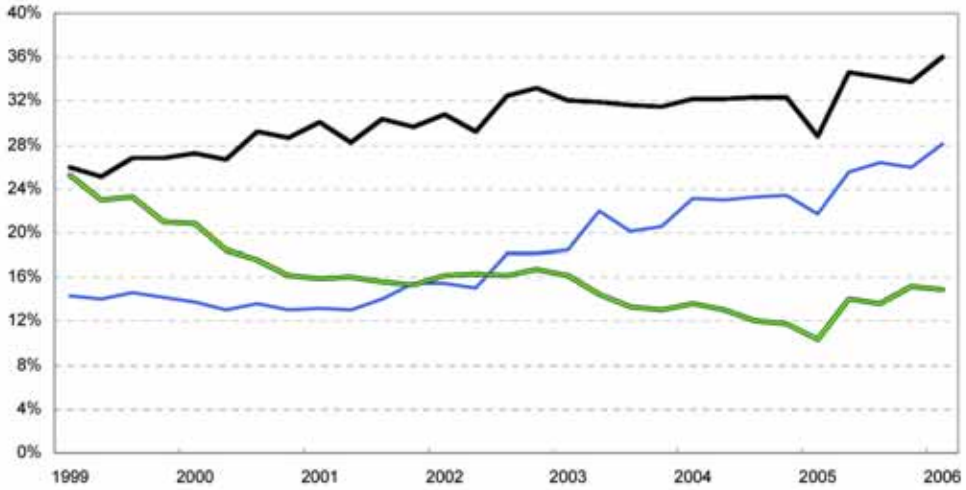
Panel B: Cross-border loans to non-banks
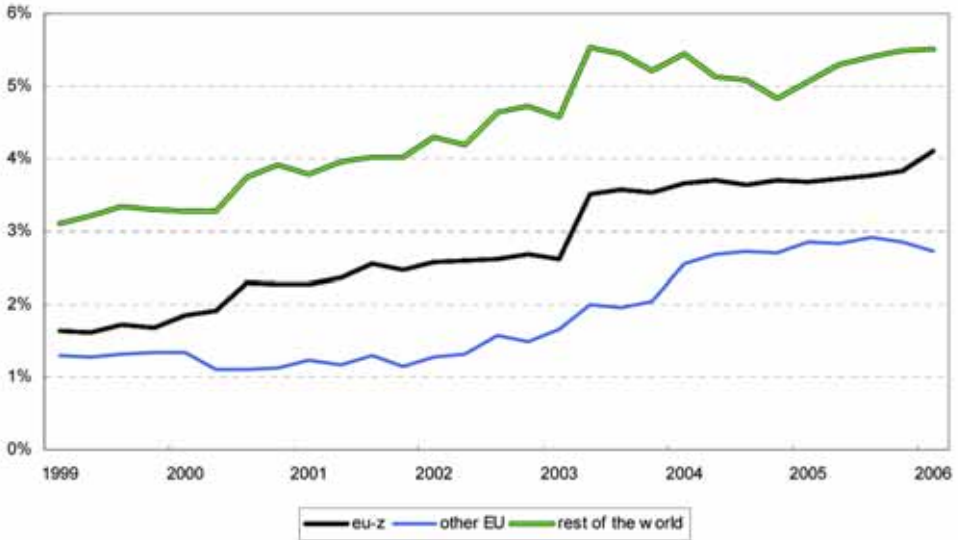
Notes: Panel A reports Figure II-1.1.13 of the background document to the *Financial Integration Monitor 2006* (European Commission, 2006a) and shows cross-border interbank loans in the eurozone (eu-z) as a percentage of domestic amounts. Panel B reports Figure II-1.1.14 from the same source and shows cross-border loans to non-banks in the eurozone as a percentage of domestic amounts.

Source: European Commission (2006a).

At the same time, it should be noted that integration, as measured by these cross-border activities, is neither a necessary nor a sufficient condition for creating an efficient banking market, for at least three reasons. First, a combination of integrated wholesale markets and competitive local markets could ensure that prices for financial services equalise. For example, if money market and bond rates as marginal cost-of-funds for lending activities were equal (as they are now in the eurozone) and if pricing was competitively based on marginal costs,[7] then similar products would carry the same price. Second, further development and broader acceptance of market-based finance alternatives could provide both the sought-after alternatives and ample competitive pressure on retail markets. Third, if banking markets were sufficiently open to foreign entry or cross-border arbitrage, national banking markets would be contestable. And in contestable markets, prices can adjust in anticipation of cross-border arbitrage activities. Under such conditions, there would be no motivation for cross-border M&As, lending or deposit-taking. The absence of such activities would then signal the existence of an integrated market rather than the lack of one. On the other hand, cross-border M&As are not an adequate condition to create an efficient banking market, especially when foreign institutions could gain dominant market positions because of competitive advantages related to size and scope. That being said, we realise that in practice cross-border M&As often play a vital role as drivers of integration. Still, the above discussion points to the importance of:

- competition and competition policy;

- enabling consumer access to lower-cost, cross-border financial services; and

- a wider perspective involving the development of the whole gamut of financial services available to retail customers.

We address these issues when discussing integration in a broader context in section 2.4.

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[7] This scenario would assume that marginal costs other than cost-of-funds were either unimportant or similar. Divergences could for example occur when marginal labour costs differ across countries, provided they were sufficiently important to produce financial products.

### 2.3.2 Integration as nominal interest rate convergence

Interest rates, as price-based measures of integration, have been advocated for a variety of reasons but particularly because these data are more readily and easily available and are typically more accurate than the quantity-based measures discussed above. Adam et al. (2002) suggest using retail interest-rate convergence measures to monitor the progress in European retail banking integration. The European Commission has followed this suggestion in its annual *Financial Integration Monitor* reports. In order to investigate interest rate convergence, one can use the ECB's non-harmonised national retail interest rate (NRIR) series, which are available until 2003. Since 2003, new harmonised monetary financial institutions (MFI) interest-rate statistics are reported. Unfortunately, these do not go back any further than 2003. As the new series are harmonised across countries, they are doubtlessly better suited to assess integration than are the old, non-harmonised series. Still, it is unfortunate that owing to the substantial differences between the non-harmonised and the harmonised series, discontinuity in the form of a clear break in the series is introduced.

For a first impression, consider the development of nominal NRIR retail interest rates between 1995 and 2003 in the EU as presented in Figure 2.4. In the eurozone, there appears to be some convergence, which mostly took place in the late 1990s. Whereas country differences were smallest at the end of 2002 for mortgage rates, short-term corporate loan rates continued to show differences of up to 6.2%. Still, within a sub-group of eurozone countries excluding Germany, Ireland and Belgium, these rates seemed more aligned. Nevertheless, by 2003, more than a decade after the 1985 Second Banking Directive came into effect and several years after the introduction of the single currency in 1999, the full convergence of interest rates had not yet been reached in retail banking markets.

Not surprisingly, given the existence of exchange rate risks, the NMS show quite different and usually higher interest rate levels; but for these countries, convergence can also be observed. Whereas in 1995 interest rate levels were as high as 30% in several countries, especially in Hungary and Slovenia, by 2003 most national interest rates were below 10%. Exceptions were consumer loan rates, where Hungarian and Polish rates showed little convergence and remained high. Additionally, for Hungarian short-term corporate loan rates and time deposit rates there is more evidence of divergence in 2002–03.

Figure 2.4 The development of nominal retail interest rates

Consumer loans

Short-term corporate loans
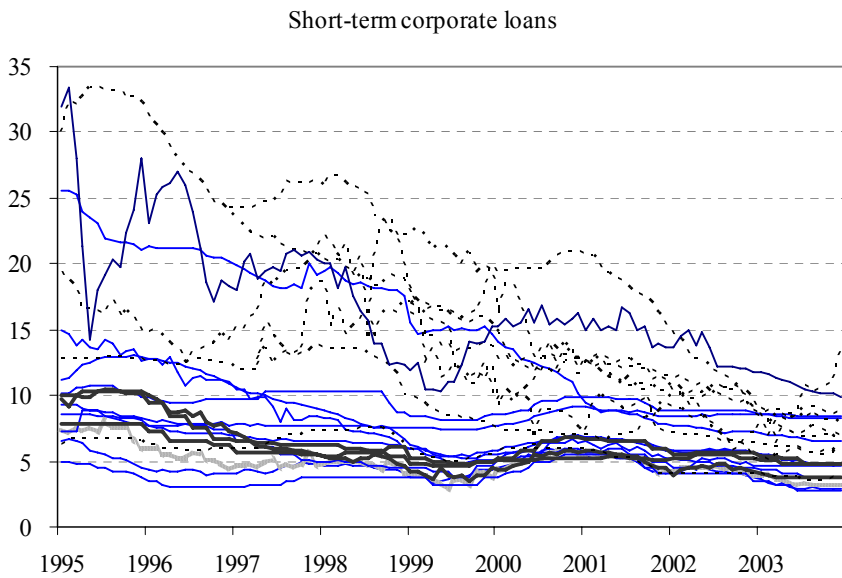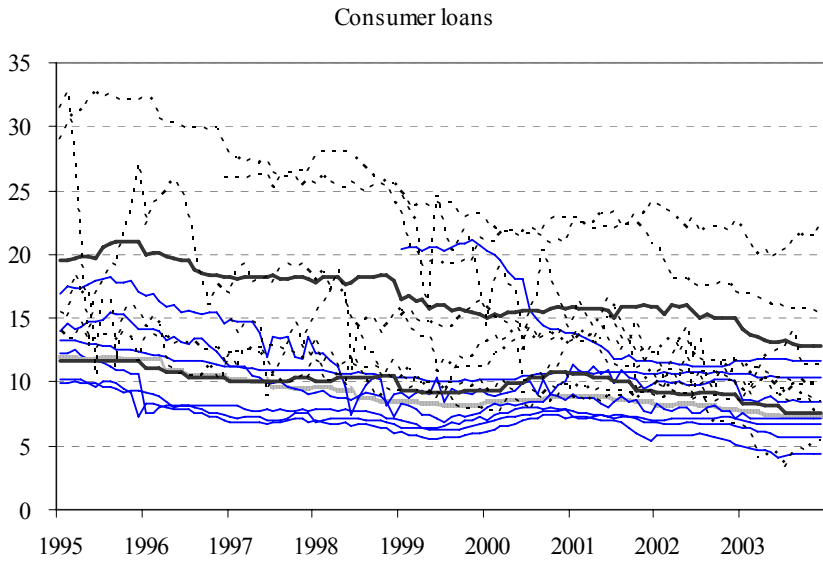
Mortgages
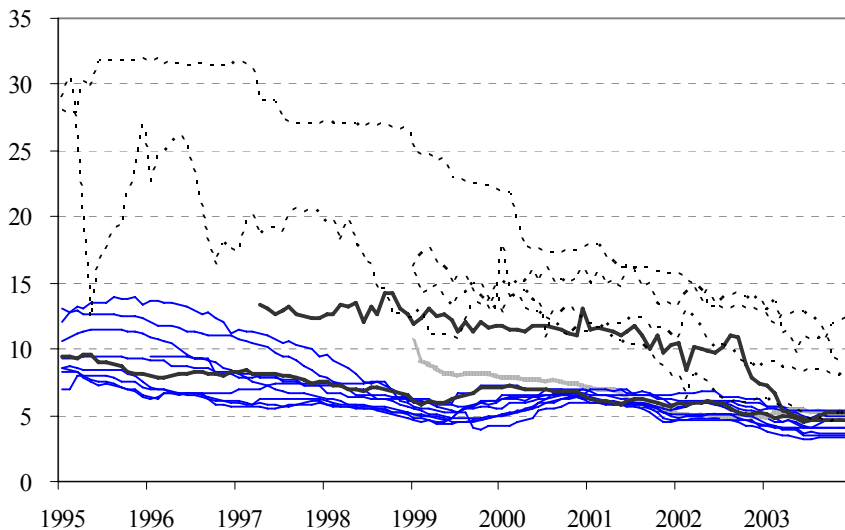
Time deposits
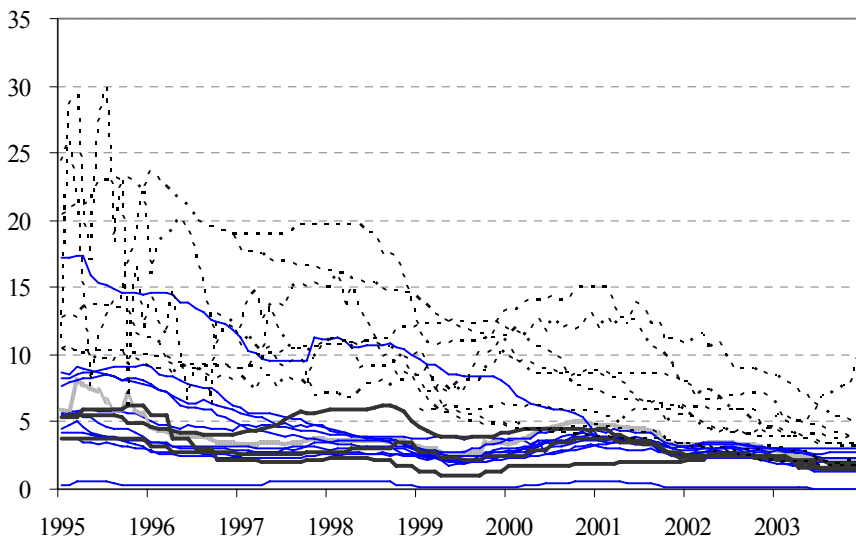
Notes: National rates for the eurozone and NMS countries are reported in thin and dotted lines, respectively. NMS do not include Malta or Cyprus. Danish, Swedish and British rates are shown in thick line.

*Source*s: Own graphs based on monthly interest rates provided by the ECB (NRIR interest rates) and national central banks.

Two measures have been suggested as formal statistical tests of convergence: σ- and β-convergence. σ-convergence measures whether or not interest rates have become more similar over time when compared with each other or with a benchmark rate. In contrast, β-convergence measures the *speed* with which national interest rates converge. With respect to banking market integration, this implies that countries with initially relatively high interest rates should show faster downward adjustment than countries with already low interest rates.[8] The Cecchini study is very much related to the idea of β-convergence. Yet, given the heterogeneity of retail interest data as well as the heterogeneity of retail finance products (see also the discussion below of the relevance of the LOOP in retail banking) σ-convergence is the more practical concept and most commonly reported indicator. It is typically measured as the coefficient of variation (CV).

Figure 2.5 shows the CV for the main retail loan and deposit types in the eurozone and provides an illustration of the development of σ-convergence over time. As expected, it shows that convergence took place mainly in the second half of the 1990s but came to a halt thereafter. Furthermore, there is a clear break between the non-harmonised and the harmonised interest rate series. In particular, the new harmonised series are much more similar. Nevertheless, no additional convergence can be observed. A continuous analysis of the integration process in the eurozone based on interest rate data can thus be misleading as it reflects not only economic but also statistical effects. In contrast, the 2006 *Financial Integration Monitor* reports continuous CV from 1993 to 2006 (see Figures II-1.1.1. to II-1.1.4 in European Commission, 2006a). These series are displayed in Figure 2.6. From 2003 onwards, harmonised MFI interest rates are used for the eurozone and Denmark. To overcome the break between the years 2002 and 2003, preliminary estimates of the back series are used for these countries. For all other countries, non-harmonised national data are used.

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[8] Details regarding the methodology are provided in Box A1 in the Appendix.

Figure 2.5 Coefficient of variation for selected nominal retail interest rates in the eurozone
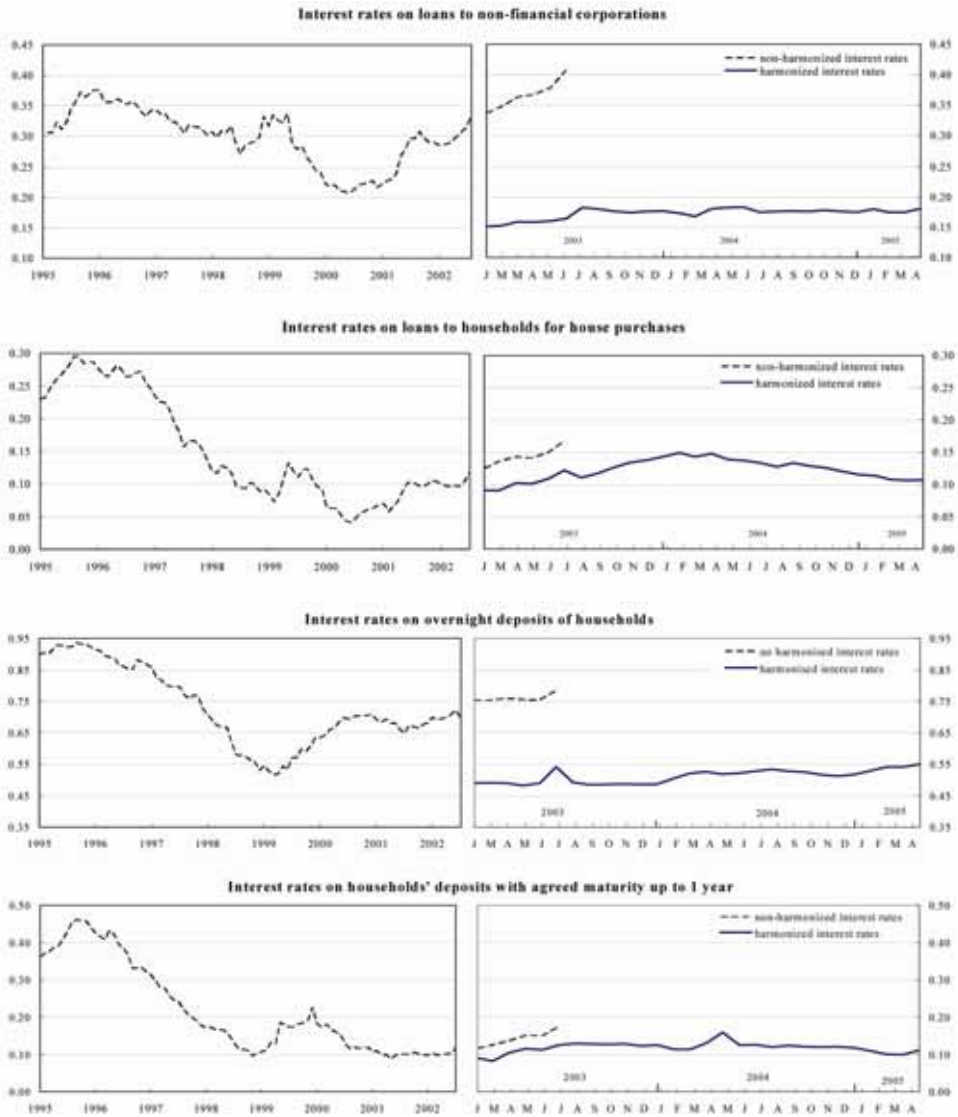
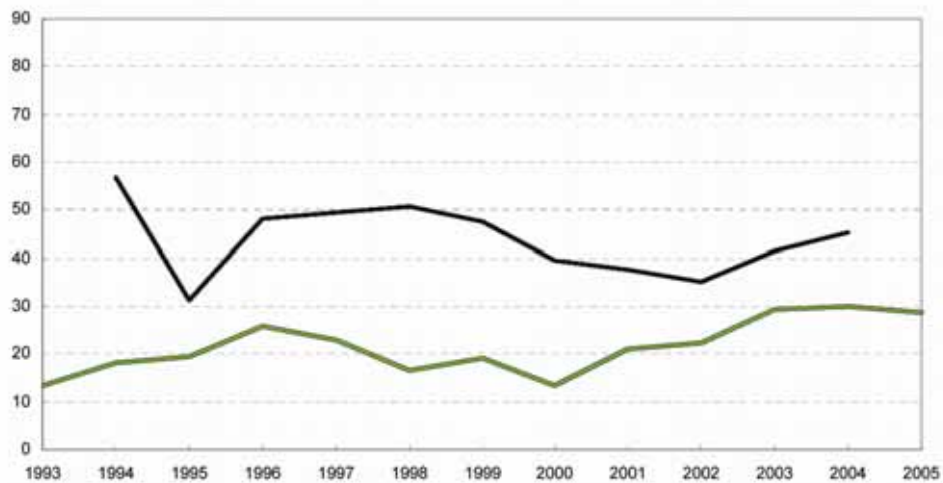*Figure 2.6 Coefficient of variation for nominal retail interest rates in the EU*
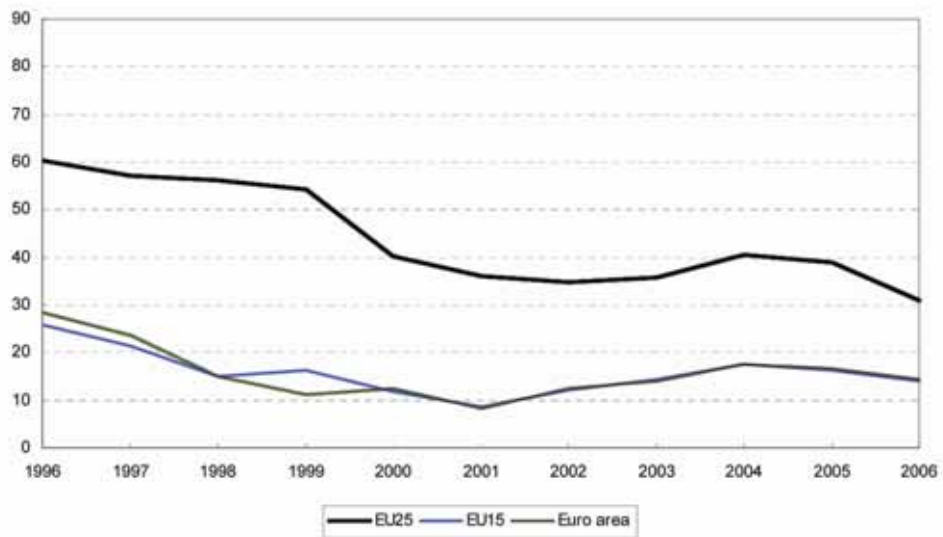
Medium- and long-term loans to enterprises
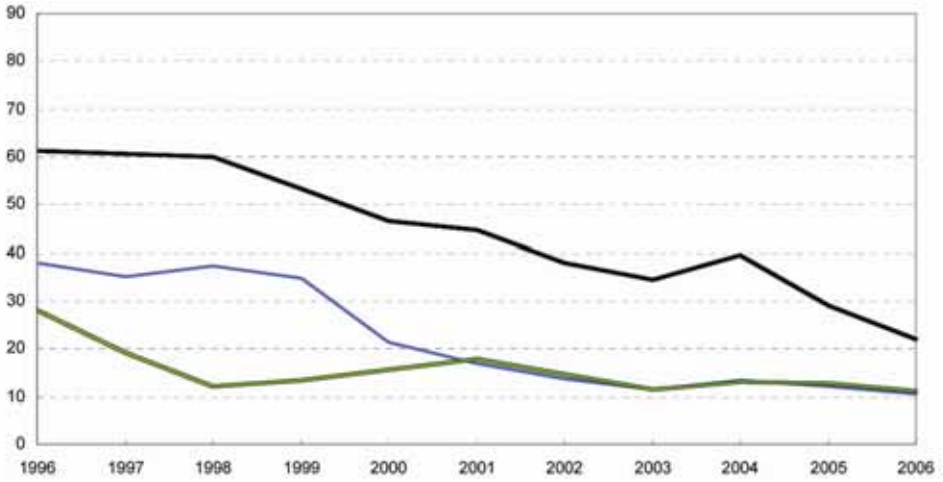
Short-term loans to enterprises
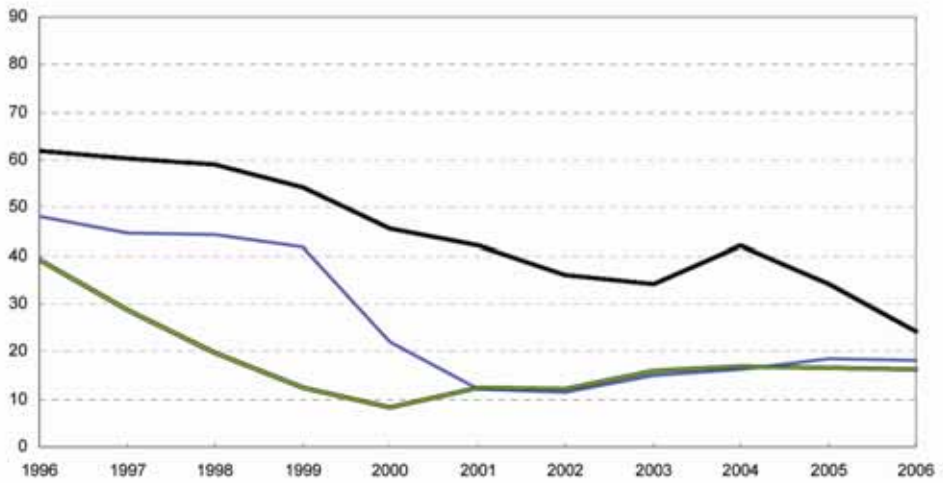
Consumer loans

Mortgages

Sources: *Financial Integration Monitor 2006*, European Commission (2006a); Figures II-1.1.1 to 1.1.4 are based on data from the European Commission's Eurostat database.

A look at the figures for all 25 European countries in Figure 2.6 gives the impression of a strong convergence process (with the exception of rates on consumer loans to households). Yet a careful inspection of the eurozone or even the EU-15 shows that the convergence process in these countries has lost momentum. Hence, we conjecture that in these countries the convergence of retail interest rates has been largely driven by the reduction or complete elimination of exchange rate risk. The convergence of wholesale market interest rates is the major force behind this process and not the increased integration of retail markets, particularly if and when retail interest rates follow developments in market interest rates closely. Consequently, the still-continuing convergence process in the EU-25 is again most likely the result of the economic stabilisation and inflation convergence process in the NMS, which has led to a closer alignment of market interest rates.

Choosing the LOOP – and thus convergence measures based on nominal interest rates – as the reference point for assessing financial market integration may have serious shortcomings, however, especially with respect to retail banking markets:

At best, the LOOP can be considered an important point of reference when exchange rate risks are either non-existent – as in the case of the eurozone – or at least constant and as such negligible.

Price differences in retail markets may not only reflect legal barriers and regulatory differences that can be *harmonised away* but also display deeply rooted differences in financial structures, economic risks, information asymmetries and preferences that may prevail. Accordingly, retail banking prices may never fully equalise but eventually only *move together*. Methodologically speaking, the prices would then only be *cointegrated*. This idea is explored in the next section of this chapter.

There is a growing body of literature that documents that even in product markets, where information imperfections are less distorting than they are in financial markets, the LOOP may not even hold for similar goods. Engel & Rogers (1996) have shown that similar goods can have different prices in different places not only because of transportation costs (measured by distance) but also because of the existence of borders. This finding holds even when the free flow of goods and distance (transportation costs) is controlled for. The authors attribute this failure of the LOOP at least partly to national differences in nominal price stickiness. As a result, national

retail rates would only move in tandem across borders when the degree of price stickiness is similar across the integrating countries and the marginal costs of producing a retail banking product are equalised, e.g. by a single monetary policy. Consequently, when money market rates equalise by means of an international arbitrage process in a monetary union, such changes have an impact on lending and deposit rates through domestic competition and other market characteristics. This integrative role of the single monetary policy is explored in greater depth in section 3.3.

The LOOP ignores other product characteristics such as product variety, quality and efficiency, as well as the profitability of the financial service provider. Therefore, the European Commission (2005b) has adopted a broader, process-oriented definition of integration:

> Financial integration is a process, driven by market forces, in which separate national financial markets gradually enter into competition with each other and eventually become one financial market, characterised by converging prices, product supply and converging efficiency/profitability among the financial services providers. Several distinct and parallel channels can further financial integration, namely: cross-border ownership, establishment or cross-border service provision.

To explore this issue further, we focus in section 2.4 on banking efficiency and profitability as well as on interest margins.

As summarised in Figure 2.7, general arguments against the LOOP are 1) transaction and transport costs, 2) regulatory differences and 3) product heterogeneity. Following Lemmen (1998), it is useful to illustrate the (ir-)relevance of the LOOP in financial markets by differentiating the two major components that constitute the 'perfect capital mobility' that is required for the LOOP to hold: full capital mobility, i.e. the absence of cross-border restrictions on capital flows and the full harmonisation of national and cross-border transaction costs and perfect asset substitutability. Single market regulation addresses restrictions in capital mobility. By doing so, it cannot make differing asset risks disappear unless it reaches for the full harmonisation of financial products in a fully integrated European economy in which all economic agents face the same risks independent of their nationality. The problem with LOOP-based measures such as nominal interest rate convergence or dispersion as measured, e.g. by CVs, is that only part of the divergence can be attributed

to a lack of full capital mobility, which in turn could be addressed by single market legislation. The remainder may be beyond the reach of single market legislation – a fact that should be fully recognised to avoid over-regulation. Thus, there is always some residual dispersion that cannot or should not be regulated away. In sum, integration must not lead to convergence and convergence does not necessarily reflect integration.

Figure 2.7 The validity of the law of one price

| | | asset substitutability | |
		perfect	imperfect
capital mobility	perfect	(1) LOOP holds	(2) LOOP + asset-specific risk
	imperfect	(3) LOOP does not hold	(4) LOOP + asset specific risk + transaction costs

Source: Based on Lemmen (1998).

2.3.3 Integration as nominal interest rate cointegration

An alternative measure of integration is cointegration. Retail banking markets may resist full convergence owing to differences in national default risks, cultural influences in the bank–client relationship, country-specific strategic bank behaviour, the lack of cross-border lending, the lack of international bank M&As and – for the eurozone at least up to January 1999 – differing monetary policy conditions. Combined with the limitations of the LOOP outlined above, one may not even expect the LOOP to hold in this market and convergence studies can provide misleading results. Therefore, an alternative is to employ the concept of cointegration to analyse the state of market integration in retail banking when lending rates are tied together by a long-term equilibrium relationship that does not demand strict price or product equalisation.[9] Cointegration analyses consider a setting where the time series of individual variables "can

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[9] Early studies that use cointegration to measure the integration of European banking markets include Centeno & Mello (1999) and Kleimeier & Sander (2000). More recent studies are Brada et al. (2005), Kleimeier & Sander (2003) or Heinemann & Schüler (2002).

wander extensively and yet some pairs of series may be expected to move so they do not drift too far apart" (Engle & Granger, 1987, p. 251). This concept realises that although full equalisation cannot be expected, the concept of market integration requires that interest rates should exhibit a certain long-term equilibrium relationship.[10]

Up to now, cointegration has only been used as a measure of integration in the EU-15 and more specifically in the eurozone.[11] Looking first at the early eurozone cointegration evidence obtained in Kleimeier & Sander (2000, 2003) over a relatively long period from 1985 to 2002, different phases of cointegration can be identified in the eurozone. Whereas it appears that the retail lending markets were weakly cointegrated before 1993, these links disappeared in the mid-1990s. Yet around the introduction of the single currency, cointegration reappeared – at least in some retail markets, especially in the short-term corporate loan markets. Roughly speaking, cointegration analysis leads to a yes–no-yes integration pattern over time to which the changes – in particular the exchange rate mechanism crises in 1992–93 – in the exchange rate regime seem to be most important. For the more recent period of the 1990s, the role of the single currency is central to the analysis, and it is believed by most authors to have introduced a shift in the structural relationships. Note, however, that as Kleimeier & Sander (2003) have shown for retail lending and deposit rates between 1995 and 2002, the break occurred in many retail markets well before January 1999, thus pointing towards an anticipation of the EMU. In addition, there were clear differences across various retail markets. In loan markets, the highest degree of (co)integration took place in corporate lending, with some integration in mortgage markets and the least integration in consumer credit markets. In deposit markets, time deposits show the strongest evidence of integration, while demand and savings deposit markets do not appear to have been integrated.

[10] For details on cointegration methodology, see Box A2 in the Appendix.

[11] For the NMS, Figure 2.4 has clearly shown that the convergence process is still underway and that interest rates continue to have distinct national trends. Thus, there is very little scope for integration in the sense of cointegration. Not surprisingly, cointegration has not been applied to these countries' interest rates as an integration measure.

More recent results provided in Kleimeier & Sander (2006) confirm for mortgage and corporate loan rates the previously mentioned yes-no-yes pattern of bilateral cointegration within the eurozone (see Figure 2.8). For mortgages, cointegration dropped from 29 relationships in the pre-EMU sub-period from January 1995 to December 1998 (reflecting 32% of the possible 90 bilateral relationships among the 10 national rates) to as few as 12, only to increase to 40 (44%) during the last EMU sub-period. Corporate loan rates show a similar pattern but reveal an overall higher level of cointegration reaching 57 (63%) bilateral cointegration relationships under the single currency. Cointegration relative to the aggregate eurozone average points to a similar pattern for corporate loan rates (not shown in Figure 2.8). During the last rolling period, 1999 to 2002, only two countries, Finland and Germany, were not cointegrated with the eurozone average. On the other hand, very little cointegration can be found for mortgage rates, where only one in five rates is cointegrated with the overall eurozone.

Figure 2.8 Bilateral cointegration of nominal retail interest rates
Panel A: Mortgages
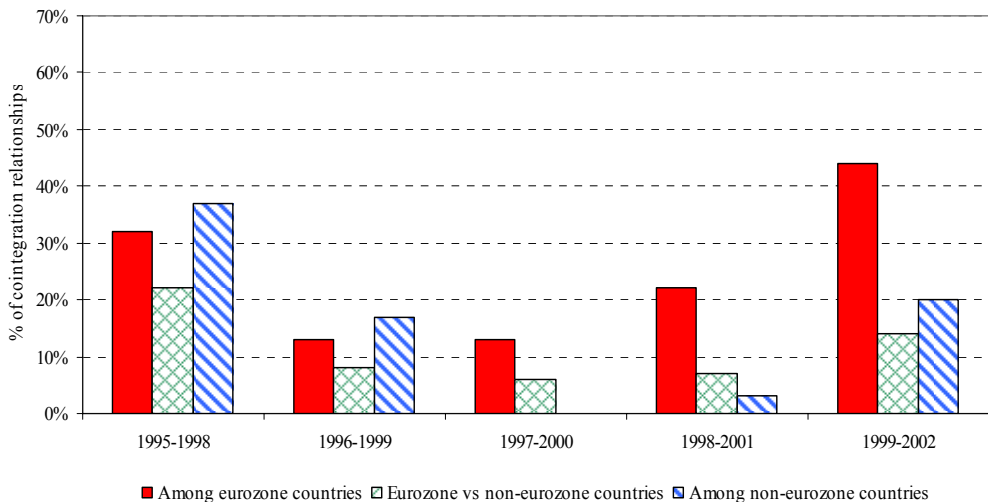
Panel B: Short-term corporate loans
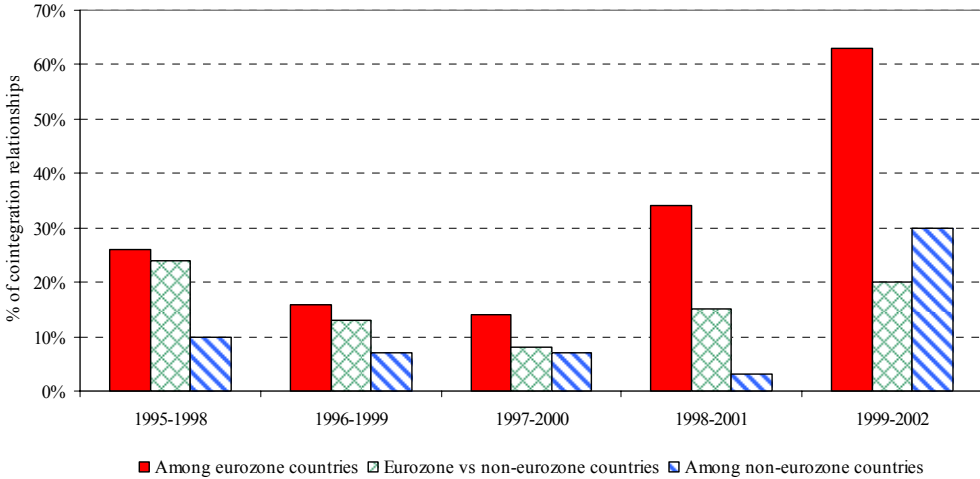
Notes: The eurozone includes Austria, Belgium, Finland, France, Germany, Ireland, Italy, the Netherlands, Portugal and Spain. The non-eurozone includes Australia, Canada, Japan, Switzerland, the UK and the US.

Source: Based on data provided in Table 3 of Kleimeier & Sander (2006).

For more recent cointegration evidence, we can no longer rely on the ECB's non-harmonised NRIR series as these were discontinued during 2003. In Figure 2.9, we therefore provide evidence for cointegration relative to the aggregate eurozone using the new harmonised MFI interest rate statistics for the period from January 2003 to August 2006. Mortgage markets still show little sign of integration as reflected by the 33% of short-term and 17% of long-term mortgages that were cointegrated – also indicating that cointegration levels had not changed compared with the previous period. Short-term corporate loan markets continued to be highly integrated. Here cointegration levels were 75% for small and 100% for large corporate loans during the 2003–06 period – a result that reflects a continuation of the increase to 80% in the 1999–2002 period. Similarly, the market for short-term time deposits, time deposits to SMEs and medium-term consumer loans appears to have been highly cointegrated.

Figure 2.9 Cointegration of nominal retail interest rates in the eurozone, January 2003 – August 2006
Panel A: Deposits
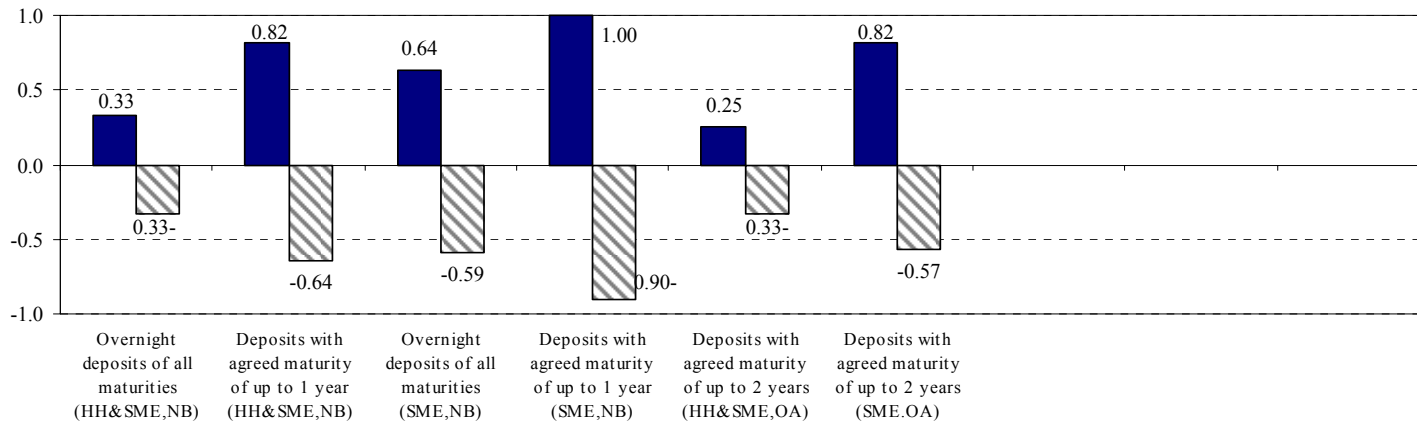
Panel B: Loans
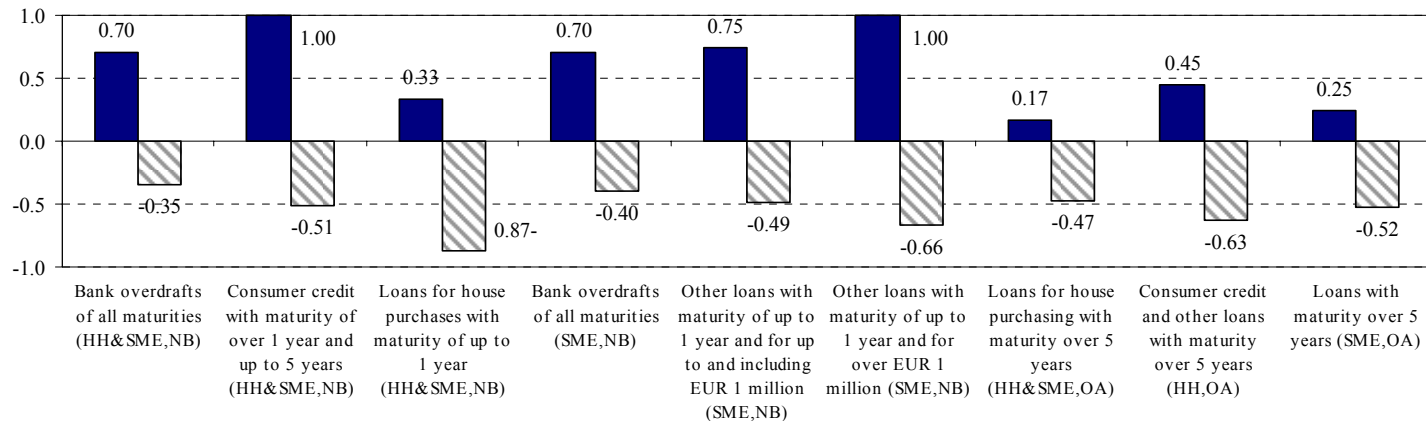
Notes: Cointegration and the speed of adjustment are established according to Kleimeier & Sander (2006). The rates are for households (HH) and/or non-financial corporations (SME) as well as for new business (NB) or outstanding amounts (OA). Solid bars indicate the fraction of national rates that are cointegrated with the eurozone aggregate rate from 0 (=0%) to 1 (=100%). The hatched bars indicate the average speed of adjustment.

Source: Own calculations based on the ECB's harmonised MFI interest rates.

Yet, a 100% cointegration level should not disguise the fact that the cointegration relationships are still very different across countries. For medium-term consumer credits, the speed of adjustment ranged from –0.11 (reflecting an adjustment time of 9 to 10 months) in Spain to –0.64 (reflecting an adjustment time of less than two months) in France.[12] As this consumer loan category seems to refer – somewhat confusingly – to households as well as to SMEs, different countries might report different market segments or it might be the case that different market segments are more predominant in some national markets. As competitive forces vary across market segments, different adjustment speeds can result. Large, short-term corporate loan markets show adjustments that are more similar. Adjustment was immediate in only two countries (Luxembourg and Finland) whereas the speed of adjustment in all other countries was from –0.40 to –0.68 or at about two months. Given this limitation, markets for large, short-term corporate loans now appear to be fully (co)integrated. One further caveat, however, remains for all rates but is especially relevant for consumer loan rates: owing to the shift from NRIR to MFI, it is not clear to what extent the observed increase in cointegration is truly a sign of more integration or to what extent it simply reflects the more homogeneous nature of the MFI over the NRIR rates.

In general, the cointegration results differ substantially from the convergence results presented before. Whereas the convergence of money market rates in anticipation of and under the single currency provides a picture of overall convergence of nominal retail banking rates, the image of segmentation, which the quantity-based approaches clearly show, is only consistently reflected in cointegration analyses. Loan products as well as lender and borrower behaviour remain different across the eurozone. Simple, nominal price-convergence measures of integration are not well suited for such an environment. It would indeed be surprising if in a market with different loan products or lending risks interest rates were equal. In such a setting, the cointegration measures of integration are more useful as they allow for such differences across national retail markets.

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[12] It should also be noted that for four countries the speed of adjustment is statistically insignificant even though cointegration is found. Effectively, a long-term relationship to which national consumer loan rates return exists in only 6 of the 10 countries, reducing the effective level of cointegration from 100% to 60%.

In sum, cointegration measures reveal that markets behave like integrated markets when both wholesale markets are integrated and retail markets are competitive. Consequently, the most integration is found in corporate loan markets and the least in lending to consumers.

2.3.4 Integration as real interest rate convergence

As another alternative we also consider real interest rate convergence. On the most fundamental level, economic theory predicts that real rates of interest on physical assets and consequently on financial assets will converge as economies integrate. More specifically, the real interest parity envisages the real rate of interest as the real rate of return on physical assets. As Goldberg et al. (2003, p. 299) argue, "[r]eal interest rate equalisation is, therefore, the broadest and arguably most theoretically appealing, of the various measures of financial integration". Moreover and from a practical point of view, real interest rates simply give the real return on an asset or the real cost of financing for Europeans – and they are hence the most appropriate measure of the effects of integration in the sense of the Cecchini study. That being said, real interest rate equalisation simultaneously requires the integration of product and financial markets. For example, if financial markets are fully integrated but product markets are not, differences in real interest rates are an immediate result when nominal interest rates equalise in the presence of inflation differentials. In sum, real interest rate equalisation means more than just financial market integration.

Nevertheless, in the presence of the remaining differences in nominal retail interest rates, be it because of limited integration or because of exchange rate risks for the countries outside the eurozone, the question arises as to which nominal interest rates the calculation of real interest rates should be based. If borrowing and investing activity reflected all the conditions of full capital mobility, the true real interest rates for European countries would be the lowest borrowing or the highest deposit rate minus their own national inflation rate. If, however, retail bank lending markets in Europe are domestic in nature, national retail rates minus national inflation rates are still the most relevant real interest rates. As Figure 2.3 has shown, less than 3% of all borrowers cross the border to obtain a bank loan from a foreign bank.

Even in the eurozone, where exchange rate uncertainty has been eliminated and transaction costs have generally declined for retail transactions, this 3% share is only slightly higher at 5%. It is thus reasonable to compare not only nominal but also real interest rates – defined as the national retail rate minus the national inflation rate.

In all regions, the EU-15, the eurozone and the NMS, national inflation rates converged substantially prior to 2000 (see Figure 2.10). Yet since 2000, inflation rates, i.e. in the eurozone, show some tendency for divergence. Additionally, the EU-15 shows about the same level of dispersion as the eurozone. Angeloni & Ehrmann (2004) argue that inflation differentials can be expected to persist for two reasons. First, neither goods nor labour markets show a trend towards further and full integration. Second, the budget, tax, labour and competition policies, which determine inflation rates, are under national control and can be expected to withstand harmonisation in the near future.

Given these persistent inflation differentials, real interest rates and hence real interest costs can be expected to vary substantially from the nominal interest rates discussed above. This expectation is confirmed by Figure 2.11, which presents real interest rates for the EU-25 countries. In contrast to nominal rates, real interest rates differ widely across countries and do not show much convergence.

To measure -convergence more explicitly, Figure 2.12 shows the CV for the eurozone, for those EU-15 countries that are not eurozone members (EU-3) and for the NMS. In general it can be observed that i) the CV was higher for the NMS than it was for the EU-3, which in turn was higher than that of the eurozone; ii) the CV in the eurozone was stable with a temporary increase in 1999 and 2000; iii) Greek real rates added to the dispersion within the eurozone; and iv) the CVs rose towards the end of the sample period, i.e. for mortgages.

To conclude, given the enduring real interest-rate differentials, persisting or even increasing asymmetries across Europe remain a concern. For example, if Europe achieves full convergence of nominal retail loan rates, a country that achieves lower product prices by opening up its market will be punished by higher real interest rates. Consequently, this calls for an approach that simultaneously takes product and financial market integration into consideration (see also Delgado, 2006).

Figure 2.10 Inflation rates in the EU (in percentages)

Panel A: EU-15
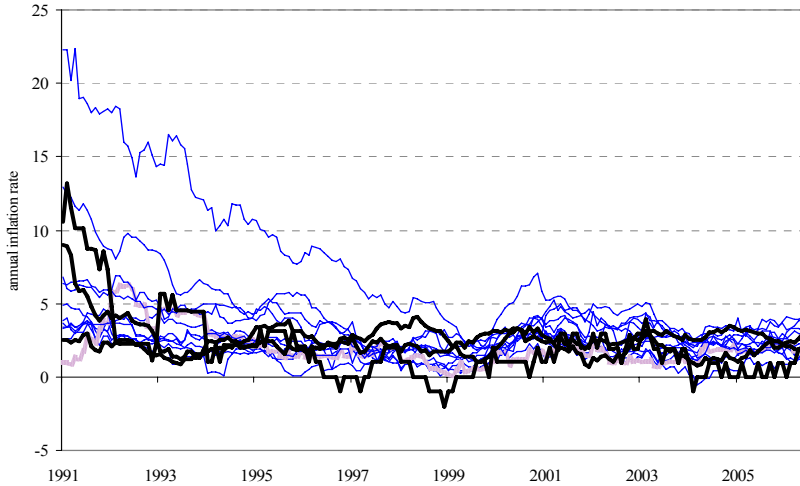
Panel B: NMS
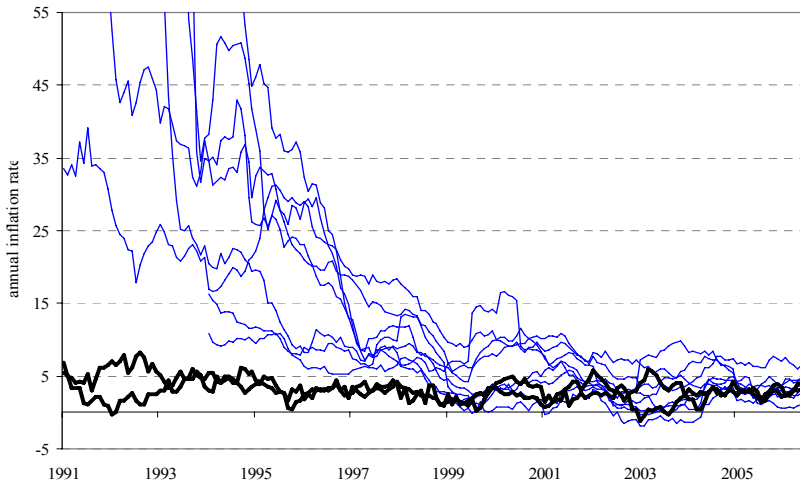
Notes: For the EU-15, rates for the non-eurozone member countries are presented with thick lines. For the NMS, rates for Cyprus and Malta are presented with thick lines.

Sources: Own calculations of annual inflation rates based on the monthly national consumer price index (line 64f) from the International Financial Statistics published by the IMF and downloaded from Datastream except for Germany (Deutsche Bundesbank) and Ireland (Central Statistical Office).

Figure 2.11 The development of real retail interest rates (in percentages)

Consumer loan rates

Short-term corporate loan rates

Mortgage rates

Time deposit rates
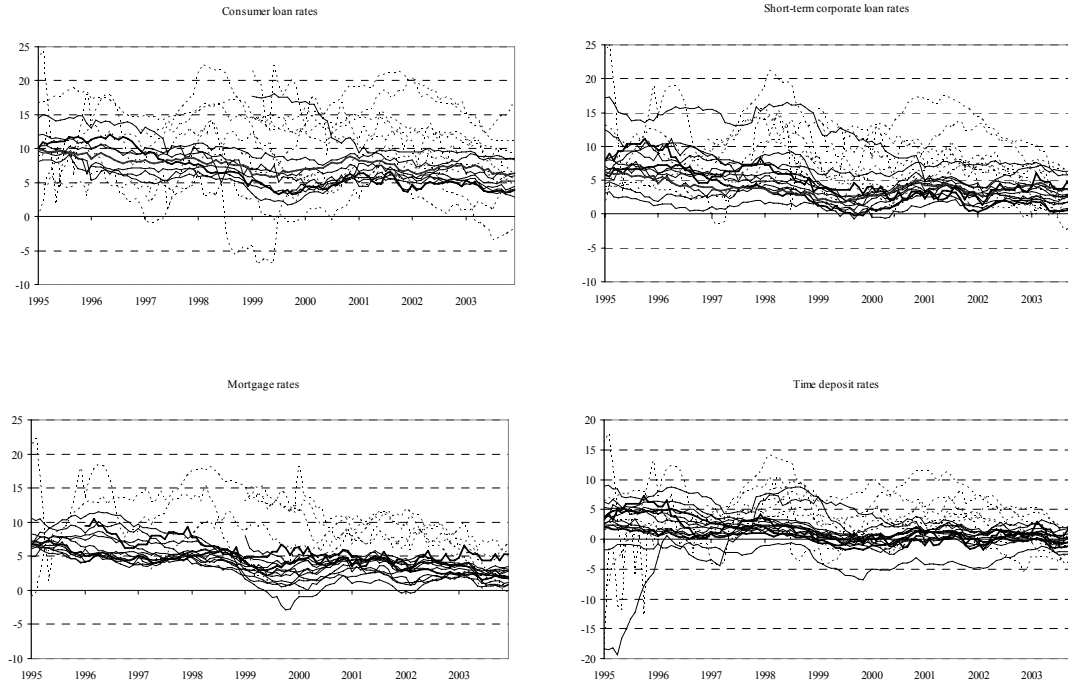
Notes: National rates for the EU-12 and NMS countries are reported in thin black and dotted respectively. The NMS do not include Malta or Cyprus. Danish, Swedish and British rates are shown in thick black.

Sources: Own calculations based on interest rates provided by the ECB (NRIR) and national central banks and CPI-based, one-year ahead inflation rates as reported in Figure 10.

Figure 2.12 Coefficient of variation for real retail interest rates in the EU
Panel A: Consumer loans
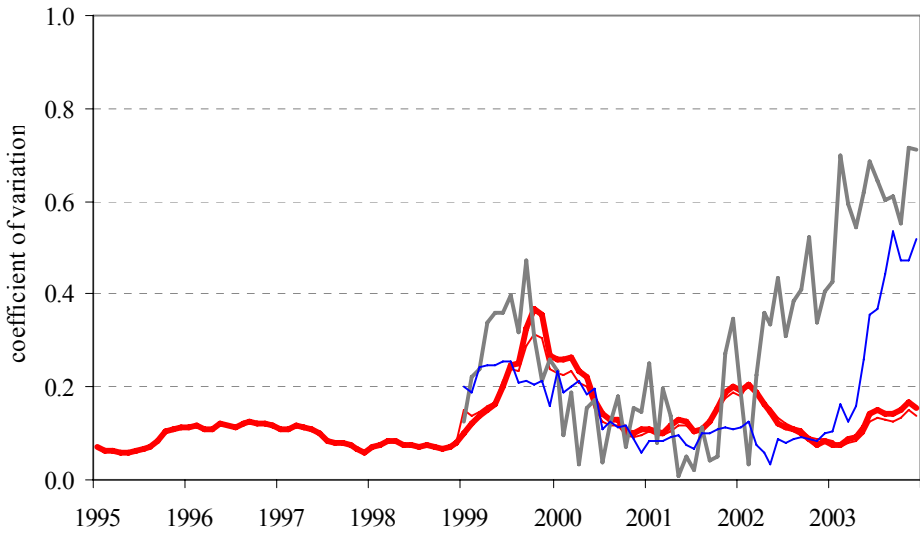
Panel B: Mortgages
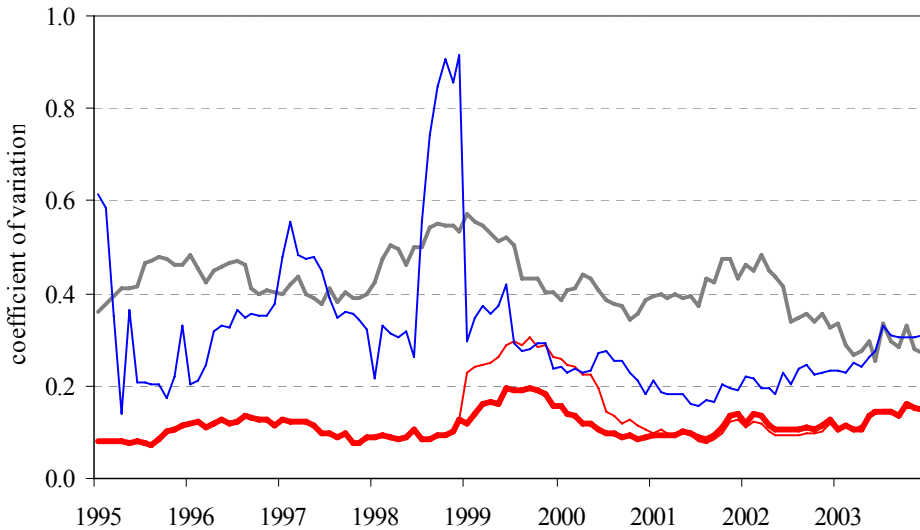
Panel C: Corporate loans
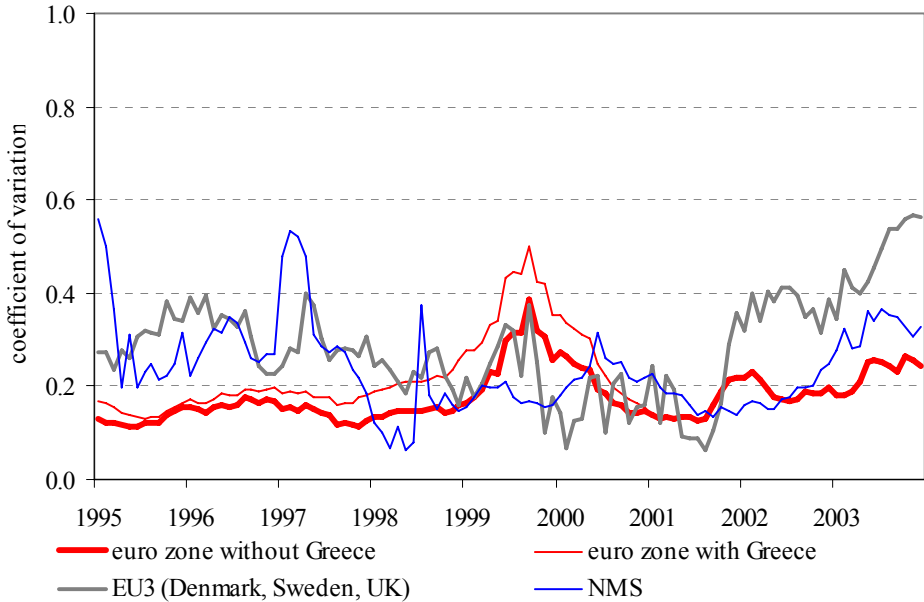
Source: Own calculations based on real interest rates shown in Figure 2.11.

2.4 Integration of the retail banking market as an economic means

Given the limitations of quantity- and price-based measures, indicators of the state and development of competition in retail banking in our view provide the most important evidence regarding the objectives that integration is supposed to achieve. The presence of competition and an integrated wholesale market, which equalises the cost of funds for banks at least in the eurozone, would be sufficient to equalise risk-adjusted returns, thus producing the very effects that one would expect from an integrated market. In this view, regular in-depth analyses of competition in retail banking such as the recent sector enquiry by the European Commission's DG Competition (European Commission, 2006b) are highly welcome. These analyses typically use a large set of indicators on market structure and market concentration, market performance and market conduct, as well as review barriers to entry. While we report only some of the most significant

findings of the sector enquiry, we additionally investigate what interest rates and here specifically intermediation margins tell us about the state and development of competition.

As financial markets are also developing and integrating on a global scale, benchmarking is crucial – for as noted earlier, otherwise the impact of changes in the global banking business induced by technological and financial innovation along with general deregulation could be mistaken for a success or failure of regional integration policies. We also report on enquiries into the pass-through from market interest rates to retail rates and highlight the implications of recent studies in this field for the state of competition, integration and monetary transmission. Finally, we present evidence on the interrelation of retail banking and financial development in general.

2.4.1 Competition and efficiency in European banking

In 2006, the European Commission argued that "[c]ompetitive financial services markets that serve European consumers and businesses efficiently contribute to economic growth and, therefore, to the achievement of the Lisbon goals" (European Commission, 2006b, p. 6). From the perspective of the European Commission, competition and efficiency hence appear not only closely related but also essential to Europe's single market project. At the same time, the European Commission also recognises that the current retail banking market structures may preclude full competition and its benefits. Five features of the European retail banking market are of particular importance here: extensive international and national regulation; a traditionally high level of cooperation among banks; entry barriers; fragmented and differing market structures; and customer demand, which is hampered by information asymmetry, customer immobility and limited bargaining power. Given these features, the European Commission is especially concerned about potentially anti-competitive and consumer-disadvantageous behaviour by banks: price coordination, non-price coordination (for example time delays for money transfers), increasing or stabilising entry barriers, enhancement of existing customer immobility and finally state intervention (for example to prevent foreign bank entry).

First and most importantly, the number of banks and the resulting degree of concentration are an issue. The number of (domestic) banks but also cross-border bank mergers and other forms of foreign bank entry play a

principal role here. In contrast to domestic M&As, cross-border M&As have a particular impact on competition: domestic M&As reduce the number of banks and increase concentration levels, whereas cross-border M&As do not affect the number of banks or concentration levels but nevertheless increase competition by introducing new banks to the market.

Regarding the competitive effect of integration, it is argued that the entry of foreign banks induces domestic banks to compete and improve their services. Academic evidence suggests that the presence of foreign banks does indeed lead to a reduction in the profitability and margins of domestic banks. Additionally, one can also argue that not only market entry itself but also the threat of it – as suggested by the theory of contestable markets – could have the described effects. Walkner & Raes (2005) expect a significant amount of consolidation in the European banking market, which in turn will lead to a more competitive market with improved economies of scale and scope for banks. The general academic evidence with respect to the resulting effects on client welfare remains mixed, however, with some indication of welfare gains in moderately concentrated banking markets owing to lower lending rates, increased deposit rates and improved credit access. These benefits are balanced by a disruption of bank–client relationships, which especially affects small borrowers. Regarding efficiency effects, the evidence is controversial. Whereas studies investigating the effects of bank mergers find only limited economies of scale, other studies find overall improved efficiency and resilience to economic shocks for the whole sector (see Walkner & Raes, 2005).

In the recent past, M&As took place mainly between domestic banks. Table 2.3 and Figure 2.1 above have already illustrated that the number of banks has dropped in the EU. Not surprisingly, this drop in the number of banks has led to a distinct pattern of concentration across different national banking markets. Banking markets in the NMS are in general more concentrated than are those in the eurozone or the EU-15 (see Table 2.5). Even within each group, there are distinct national differences. Concentration levels in Hungary and Poland are more in line with the moderately concentrated markets in the eurozone such as Portugal, France and Greece. In contrast, concentration levels in Belgium and the Netherlands are more in line with the more concentrated markets in the NMS such as Lithuania and Malta.

Table 2.5 The structure of the European banking sector in 2004

	Concentration		Profitability & efficiency				Solvency		Balance sheet	
	Herfindahl index	**CR5 = share of 5 largest banks**	**Return on assets**	**Return on equity**	**Net interest income**	**Cost-to-income ratio**	**Overall solvency ratio**	**Tier 1 ratio**	**Loans to customers**	**Amounts owed to customers**
	(total assets)	**(as a % of total assets)**	**(as a % of total assets)**	**(% of tier 1)**	**(as a % of total income)**	**(as a % of total income)**			**(as a % of total assets)**	**(as a % of total assets)**
Austria	552	43.8	0.60	14.46	66.95	63.31	11.87	7.93	50.55	42.33
Belgium	2,100	84.3	0.47	14.06	61.73	65.33	12.94	9.38	42.55	50.02
Finland	2,680	82.7	0.71	8.03	67.12	56.81	19.36	16.73	53.16	40.15
France	623	44.7	0.55	12.62	26.01	66.02	10.42	9.57	39.59	30.98
Germany	178	22.1	0.12	3.87	55.86	68.89	11.82	7.51	42.91	35.17
Greece	1,069	65.0	0.61	10.11	69.31	62.37	12.91	10.18	62.03	68.98
Ireland	556	43.9	0.71	15.38	58.50	49.40	12.30	10.18	47.50	28.69
Italy	230	26.0	0.61	10.58	61.08	58.08	11.65	8.67	59.17	43.84
Luxembourg	304	29.7	0.48	11.30	41.35	53.94	16.88	13.92	20.57	37.44
Netherlands	1,726	84.0	0.50	13.08	58.63	67.26	11.87	9.57	55.65	46.11
Portugal	1,093	66.5	0.75	11.75	59.93	58.89	11.57	9.64	64.36	50.41
Spain	482	41.9	0.76	15.12	62.41	55.32	11.59	7.91	62.27	53.18
Denmark	1,146	67.0	0.55	13.07	66.98	55.92	12.97	10.33	57.79	23.29
Sweden	854	54.4	1.03	14.24	72.31	62.30	17.78	17.93	35.92	66.67
UK	376	34.5	0.75	16.75	69.26	42.93	14.07	8.80	58.14	46.57

Table 2.5 cont.

Cyprus	1,365	69.4	0.21	3.51	71.04	61.27	13.30	10.22	58.15	82.14
Czech Rep.	1,103	64.0	1.29	24.71	47.61	62.59	11.90	11.57	40.10	64.74
Estonia	3,887	98.6	2.02	24.34	62.02	49.17	11.47	11.07	73.25	57.21
Hungary	795	52.7	1.89	24.92	74.69	55.98	12.21	11.17	61.32	59.74
Latvia	1,021	62.4	1.15	22.81	54.08	57.40	11.10	10.26	55.58	64.77
Lithuania	1,854	78.9	0.94	15.95	64.14	66.89	11.42	8.64	65.43	63.83
Malta	2,015	78.7	1.07	10.15	64.53	37.05	21.27	22.58	39.62	42.40
Poland	692	50.2	1.32	16.54	56.49	65.04	15.59	15.34	47.92	68.14
Slovak Rep.	1,154	66.5	0.62	11.47	59.36	63.46	11.11	7.75	55.45	60.99
Slovenia	1,425	64.1	0.64	15.81	65.24	60.10	10.82	8.63	61.26	28.77
Eurozone	966	52.9	0.57	11.70	57.41	60.47	12.93	10.10	50.03	43.94
EU-15	931	52.7	0.61	12.29	59.83	59.12	13.33	10.55	50.14	44.26
NMS	1,531	68.6	1.12	17.02	61.92	57.90	13.02	11.72	55.81	59.27
EU-25	1,171	59.0	0.81	14.19	60.67	58.63	13.21	11.02	52.41	50.26

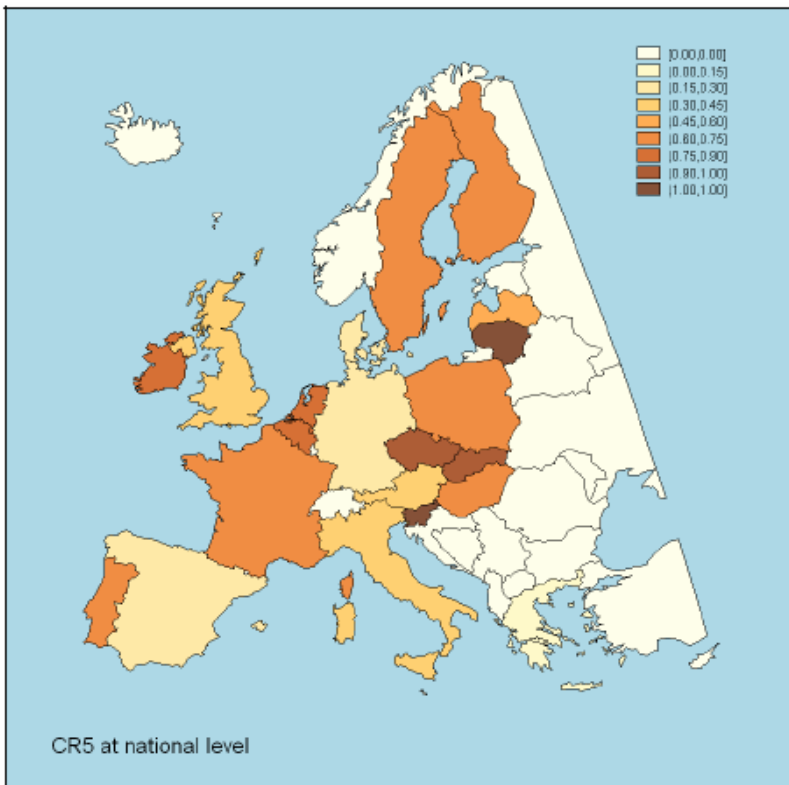*Note*: Regional averages are own calculations and unweighted averages.

Source: For concentration, Table 3 in the Annex of ECB (2005a) and for all other measures, Table 16 in the Statistical Annex of ECB (2005b) representing all banks.

The European Commission (2006b) provides a more specific analysis regarding the concentration of *retail* banking markets based on current account income and deposits, and finds the following CR5 ratios (the asset share of the five largest banks) for 2004: 53% to 58% for the EU overall, 53% to 57% for the EU-15 and a somewhat higher 62% to 64% for the NMS. These retail concentration levels are roughly similar to the concentration levels of the regional banking markets. For specific countries, overall versus retail concentration levels appear to differ. Given these differences, we can only generally conclude that the European integration project has not (yet) led to a uniform concentration level of national banking markets.

Furthermore, the national retail concentration ratios might disguise differences in regional – e.g. within-country – concentration levels. Figure 2.13 explores just these differences based on a CR5 proxy for current accounts.

Figure 2.13 Concentration levels in the retail banking market

Panel A: National concentration levels

CR5 at national level

Panel B: Regional concentration levels

Legend:
- [0.00,0.00]
- [0.00,0.15]
- [0.15,0.30]
- [0.30,0.45]
- [0.45,0.60]
- [0.60,0.75]
- [0.75,0.90]
- [0.90,1.00]
- [1.00,1.00]

CR5 at regional level
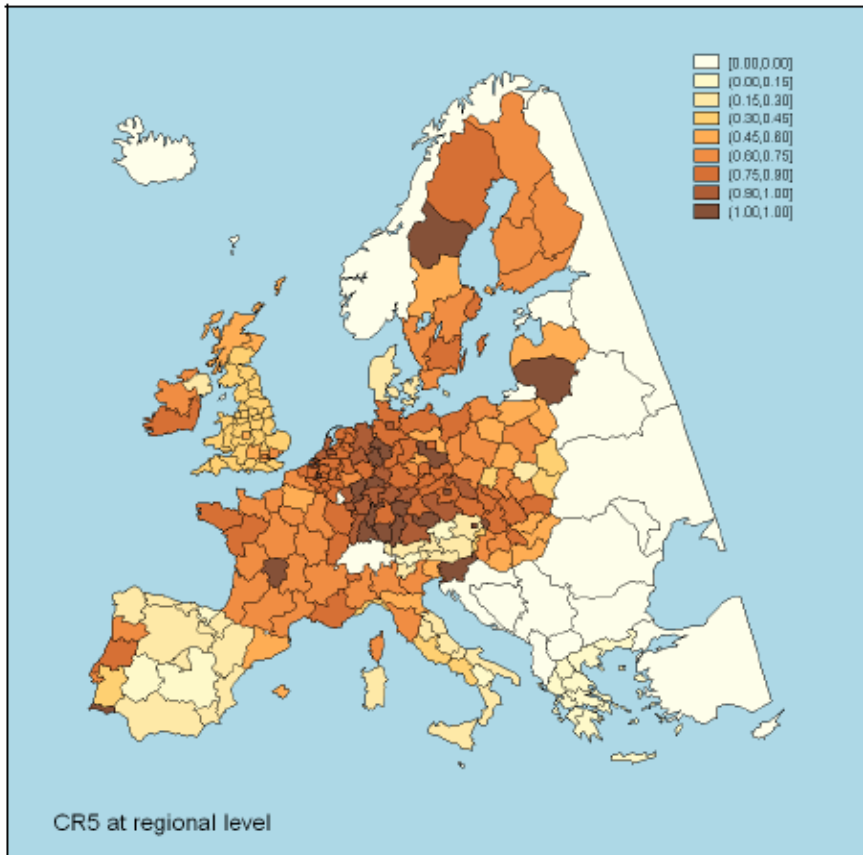
Notes: Concentration ratios are based on current accounts. Luxembourg, Cyprus, Malta and Estonia are excluded.

Source: See Figures 12 and 14 in European Commission (2006b).

Differences are notably pronounced for the German retail banking market, which shows low concentration on a national level but high concentration on a regional within-country level – most likely owing to the prominence of savings and cooperative banks, which have a regional monopoly but joint national activities. Given the localised nature of retail banking, these regional concentration measures clearly paint a more accurate picture of the market structure.

Although not indicative of the underlying causes of dynamics of retail banking efficiency, the banks' financial statements give a distinct

impression of the current efficiency as well as the profitability of banks. Table 2.6 shows that retail banking markets still differ substantially between the EU-15 and the NMS. Whereas in the EU-15 banks generate most of their consumer income from mortgages, current accounts provide the leading share of income in the NMS. Likewise, for the SME retail banking sector, current accounts are the dominant income source for banks in the NMS providing 63.91% of gross income. In comparison, for banks in the EU-15, 78.22% of gross income is generated by SME current accounts and term loans combined. Overall profits and costs as a percentage of income have become similar over the three-year period from 2002 to 2004 and now amount to just less than 30% for profits and between 62% and 66% for costs, respectively.

Table 2.6 The structure of the European retail banking sector

Panel A: Gross income share by consumer product line in 2004				
	Current accounts (%)	Deposits & savings (%)	Consumer loans (%)	Mortgages (%)	Credit cards(%)
EU	27.87	17.16	17.66	30.06	7.25
EU-15	26.50	15.94	17.05	32.85	7.66
NMS	34.95	23.45	20.85	15.62	5.13

Panel B: Gross income share by SME product line in 2004			
	Current accounts (%)	Term loans (%)	Credit lines (%)	Leasing (%)
EU	42.03	37.82	15.96	4.20
EU-15	37.79	40.43	17.17	4.61
NMS	63.91	24.30	9.72	2.07

Panel C: Profits before tax as a % of total retail income		
	2002	2003	2004
EU	21.60	24.50	28.80
EU-15	23.30	25.10	28.90
NMS	12.40	21.00	28.30

Panel D: Operating costs as a % of total retail income		
	2002	2003	2004
EU	65.80	66.20	62.60
EU-15	64.20	65.90	65.80
NMS	74.10	67.70	62.20

Note: Regional averages are based on country-level averages weighted by population.

Sources: Panel A is based on Table 16, Panel B on Table 17, Panel C on Table 22 and Panel D on Table 24 in European Commission (2006b).

For the banking market as a whole, Table 2.6 provides an insight as to whether banks in highly concentrated markets are more profitable or efficient than are banks in less concentrated markets. It appears that in more concentrated markets, banks earn higher return on assets and return on equity while providing more loans and deposits (relative to their asset size) to customers. The other characteristics do not seem to be related to concentration in a clear way. For retail banking markets, the European Commission (2006b) conducts more specific regression analyses regarding the relationship between market conditions and financial performance – i.e. the relationship between bank size or market share on the one hand and profitability or cost-to-income ratios on the other. They find a small and significant positive relationship between banks' market share and profitability, which is in line with our interpretation for the whole banking market. All other relationships – except a small negative relationship between bank size and cost-income ratio indicating limited economies of scale in retail banking – are generally weak.

So far, we have investigated competitive behaviour from the banks' perspective. Another important structural element is customer behaviour. In particular, the mobility of customers can enhance the competitive nature of a market. A low degree of mobility either could suggest that customers are generally satisfied with their bank or could signal the existence of high switching costs. Barriers to switching can affect the retail banking market in different ways:

It can lead to more market power for banks, for example when banks charge higher prices to new customers and reward repeat customers with lower prices.

It can pose a barrier to entry for other banks as the latter have to compensate customers for their switching costs and hence might find the new market unattractive. Or as new entrants cannot enter the market with only a few products, they would be compelled to go for a more complete and thus risky full-product entry strategy.

It can discourage product innovation, as customers are slow to switch to banks that offer new products.

Table 2.7 reveals rather limited customer mobility. The average age of a current account in the EU is about 10 years for consumer accounts and 8 years for those of SMEs. Consequently, the churn – the proportion of

customers who change banks every year – is also rather low with 7.78% for consumers and 12.63% for SMEs. The higher churn for SMEs could simply be driven by the shorter lifespan of SMEs or could alternatively indicate that SMEs are more mobile and put more effort into finding the right bank. There are also clear national differences. Hungary has the highest churn rates with 10.41% and 17.59% for consumers and SMEs, respectively, compared with Greece with 2.36% for consumers and Lithuania with 3.34% for SMEs. On average, the NMS tend to have higher churn rates than the EU-15, which is partly driven by the number of new banking relationships.

Table 2.7 Customer mobility in the European retail banking market

	Churn (adjusted for customer growth) (%)		Average age of the current account (in years)	
	Consumers	**SMEs**	**Consumers**	**SMEs**
Austria	6.57	10.42	11.64	8.42
Belgium	5.27	8.90	10.04	9.99
Cyprus	10.33	13.00	6.65	4.63
Czech Republic	8.61	10.70	7.91	7.87
Denmark	10.02	15.43	12.06	9.75
Finland	4.23	6.27	17.44	13.98
France	6.84	12.26	11.06	8.39
Germany	8.46	15.15	11.55	9.85
Greece	2.36	3.55	4.34	5.23
Hungary	10.41	17.59	6.26	4.29
Ireland	5.44	6.95	8.13	10.14
Italy	7.68	11.23	9.39	8.23
Latvia	6.74	7.13	3.11	4.81
Lithuania	7.73	3.34	6.23	4.46
Luxembourg	6.46	11.29	7.2	6.45
Malta	5.39	6.49	8.83	6.64
Netherlands	4.17	8.88	14.33	10.45
Poland	9.11	17.00	6.18	4.04
Portugal	11.88	14.34	11.21	8.87
Slovak Republic	10.81	15.80	4.49	5.54
Slovenia	5.97	10.89	7.02	3.06

Table 2.7, cont.

Spain	12.12	10.34	6.91	6.02
Sweden	5.62	8.80	11.82	12.33
UK	5.07	13.72	10.66	7.66
EU	7.78	12.63	9.74	7.93
EU-15	7.55	12.21	10.40	8.56
NMS	9.02	14.82	6.28	4.67

Notes: Churn is given for 2005 and is obtained from Table 36 in European Commission (2006b), which is defined as (new current accounts + closed current accounts) ∕ (2 * number of current accounts beginning of the year). To adjust for customer growth, the absolute value of the country-level rate of growth of current accounts divided by 2 is deducted from the original churn value. The age of the current account is obtained from Table 37 (from the same source). Regional averages are based on country-level averages weighted by population. No data are available for Estonia.

Source: European Commission (2006b).

The overall low mobility in the retail banking market could simply indicate that customers are generally satisfied with their bank – and survey evidence reflects as much. Simultaneously, these surveys have shown that consumers cannot easily switch banks and experience difficulties regardless of whether they are satisfied with their bank. Low customer mobility may very well point to the presence of high switching costs or could be related to administrative burdens, information asymmetries and low price transparency, cross-selling and the bundling of banking products, customer preferences and choices, or closing charges. Evidence for all these factors exists as discussed in Box 2.1.

In retail banking markets where customers switch more frequently, competition among banks will be higher. Thus, a negative relationship between mobility and the indicators of competition (profitability or concentration) can be expected. The European Commission (2006b, p. 115) indeed finds that customers in more concentrated and more profitable markets are less mobile, but it shies away from the conclusion that "low mobility indicators signal that highly profitable and concentrated markets in Europe are solely the result of a lack of competition".

Box 2.1 Switching costs as a cause of low customer mobility

Administrative burdens

Whereas only 20% of all customers find it difficult to switch banks, this percentage increases to 75% for those customers who are dissatisfied with their bank.

Price transparency

Banks tend to set prices for either account management or payments (or both). This tactic differs across countries and time, leading to low price transparency and making cross-border price competition difficult. A substantial fraction (59%) of consumers report that they find it difficult to understand the financial information provided by banks and 54% find that they cannot easily compare the information of different banks.

Information asymmetries

As banks learn about the credit quality of their customers over time, a longer banking relationship is beneficial for the customer. This tie reduces switching. Furthermore, switching to foreign bank lenders is made more difficult as most credit registers are national.

Cross-selling and bundling of products

Consumers typically buy more than one product from a bank. The most prominent 'hook-on' product is a mortgage. In the EU-25 as a whole, consumers who obtain a mortgage also obtain 2.97 products from the same bank. For current accounts and deposit accounts as hook-on products the ratio is somewhat lower with 2.14 and 1.81 products, respectively. Correspondingly, SMEs who obtain a credit line/overdraft, a loan or a current account buy 3.03, 2.81 and 2.02 products from the same bank, respectively. Differences across countries are substantial. In general, however, consumers and SMEs in the EU-15 buy more products from their banks than their counterparts do in the NMS.

Customer preferences and choices

It appears that because of the complex nature of banking products and the difficulty customers have in understanding these products, customers prefer a locally present bank (in contrast to distance banking through the Internet, telephone, etc.). Factors such as proximity to home or work, family history with a bank, trust and service quality are important determinants for customers when choosing their bank.

Box 2.1, cont.

Closing charges

Until very recently, closing charges and early repayment fees existed in most EU countries and could be substantial. For example, whereas most countries do not charge for closing a current account, where such fees are applied they can amount to as much as €60 in Italy but are more commonly limited to no more than €15 in Belgium, Portugal, Slovakia and Slovenia.

Source: European Commission (2006b).

In sum, the evidence points to limitations in competition and the existence of barriers to entry. Yet, these market characteristics differ not only across countries but also across regions within countries. Consequently, market entry and competition will remain fundamental to achieving growth-enhancing, efficient banking markets in the EU.

2.4.2 *Intermediation margins and the importance of global benchmarking*

While the findings of the previous competition analyses inform us about the state and development of competition they can also be complemented by a time-series analysis of intermediation margins, which are also – although arguably rather rough – indicators of competition. The analysis of margins has the advantage that their convergence can be interpreted as a sign of integration and their reduction as a sign of competition (Cabral et al., 2002; Baele et al., 2004). That being said, an analysis for the EU alone is not sufficient. Competition does not arise solely from within the EU but is also a global phenomenon. As financial markets are developing and integrating on a global scale, *benchmarking* is therefore important (otherwise, as noted above, the impact of changes in the global banking business induced by technological and financial innovation along with general deregulation could be mistaken for a success or failure of regional integration policies). Global benchmarking is necessary and can easily be done for a time series of intermediation margins. In Kleimeier & Sander (2006), we advocate a difference-in-differences (DD) approach to intermediation margin analysis, which avoids the mistake of over-identifying eurozone convergence and provides results for eurozone

convergence that can truly be attributed to European integration efforts rather than to part of a global integration process.

We conduct the analysis for just mortgages and corporate loans as globally comparable series are only available for these two rates. Figure 2.14 shows the margins and reveals three features:

Globally as well as in the eurozone, mortgage margins are smaller than are corporate loan margins.

Global mortgage margins do not appear to converge much. Yet in the eurozone, convergence can be observed until the introduction of the single currency.

For corporate loan margins there is again no clear indication of global convergence but these margins appear to have a smaller spread/variation than do eurozone margins.

Note, however, that there are basically three outliers in the eurozone: Belgium, Germany and Ireland. Without them, the remaining eurozone can be considered a convergence club where margins are relatively close together and convergence can again be found before the monetary union.
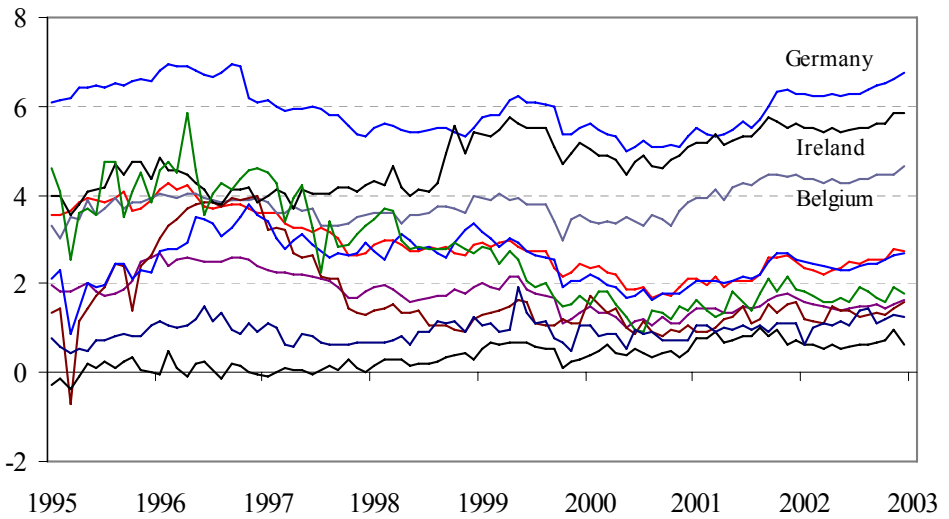
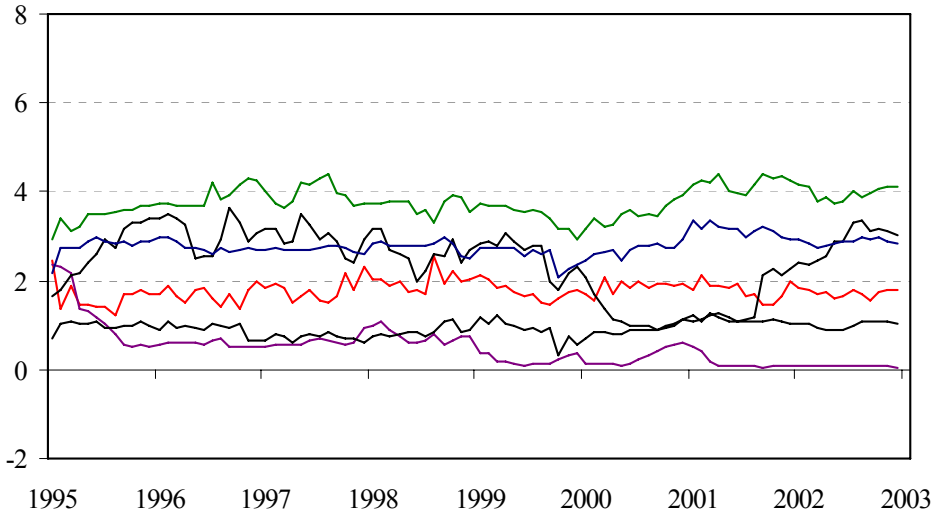*Figure 2.14 Interest rate margins*
Panel A: Eurozone mortgages
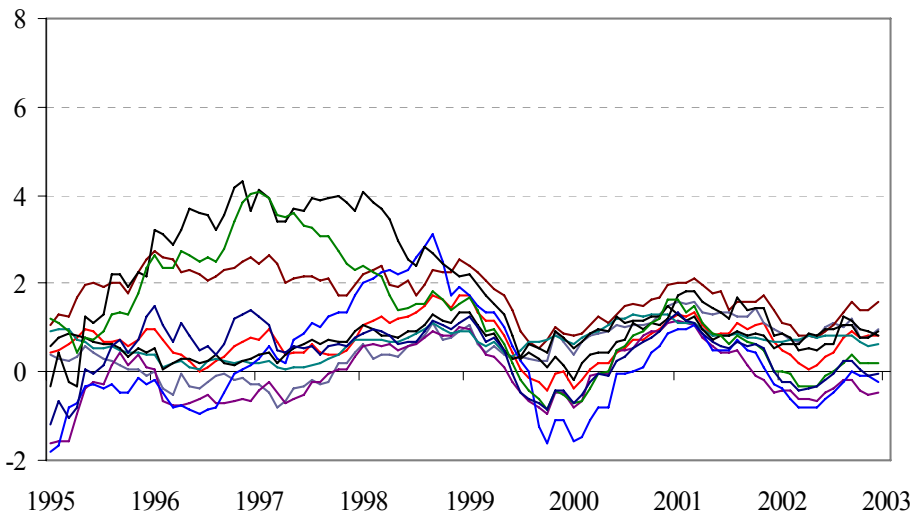
Panel B: Non-eurozone mortgages
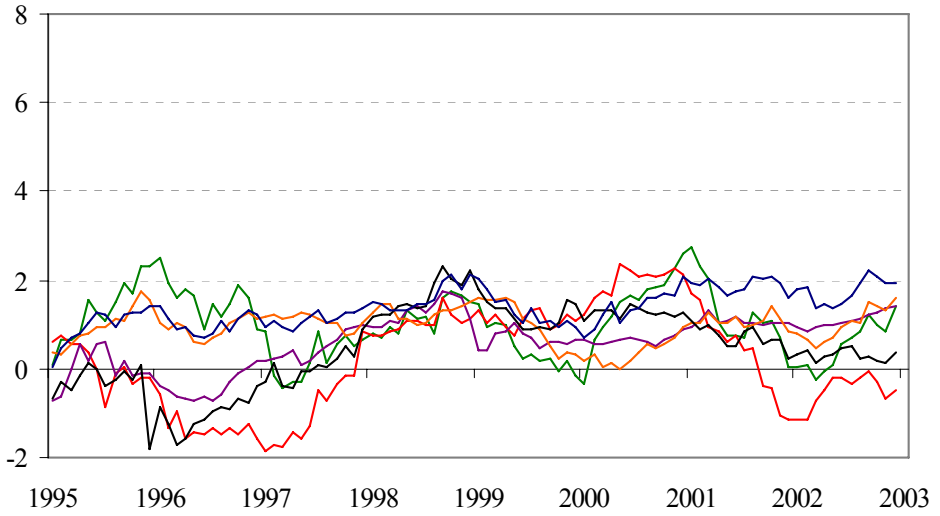
Panel C: Eurozone corporate loans

Panel D: Non-eurozone corporate loans

Notes: The eurozone contains Belgium, Finland, France, Germany, Ireland, Italy, the Netherlands, Portugal and Spain. The non-eurozone contains Australia, Canada, Japan, Switzerland, the UK and the US. Margins are given as a percentage per annum and are calculated based on 3-month money market rates for corporate loans and 10-year government bonds for mortgages.

Source: Figure 1 in Kleimeier & Sander (2006).

Figure 2.15 illustrates the results of the DD analysis. σ-convergence measures whether or not interest rates have become more similar over time when compared with each other or with a benchmark rate. In contrast, β-convergence highlights the speed with which national interest rates converge. It implies – again very much in the sense of the Cecchini report – that countries with initially relatively high interest-rate margins should show faster downward adjustment than countries with already low margins. Regarding mortgage margins, the analysis reveals that σ-convergence was much stronger outside than inside the eurozone in the pre-EMU period. As such, no eurozone-specific σ-convergence can be found. Nevertheless, the β-convergence results for eurozone mortgage margins reveal a convergence process that was present over the whole investigation period, which even increased during the EMU period. Still, non-eurozone β-convergence was about twice as high. Thus compared with a global benchmark, eurozone mortgage margins exhibit relatively less β-

convergence. This result might therefore indicate that the convergence of margins is not so much driven by eurozone-specific processes such as measures to promote a single banking market, but by a global process of financial innovation and competition. Regarding corporate loan margins, the results reveal eurozone-specific σ- and β-convergence only during the pre-EMU period. Since the graphical picture in Figure 2.1 reveals the existence of a convergence club for corporate loans, we also conduct the analysis for a restricted eurozone excluding Germany, Belgium and Ireland. Interestingly, for these countries, corporate rate margins have continued to converge under the single currency. Hence, the results from the DD analysis are somewhat in line with the evidence from quantity-based measures of integration, which paint a more pessimistic picture of the state of retail banking integration in Europe than do reports of simple interest rate convergence. The results should in turn remind us that improvements in the efficiency of banking intermediation cannot readily be attributed to regional integration policies.

Figure 2.15 Benchmarking margin convergence in the eurozone against margin convergence at the global level

Panel A: σ-convergence
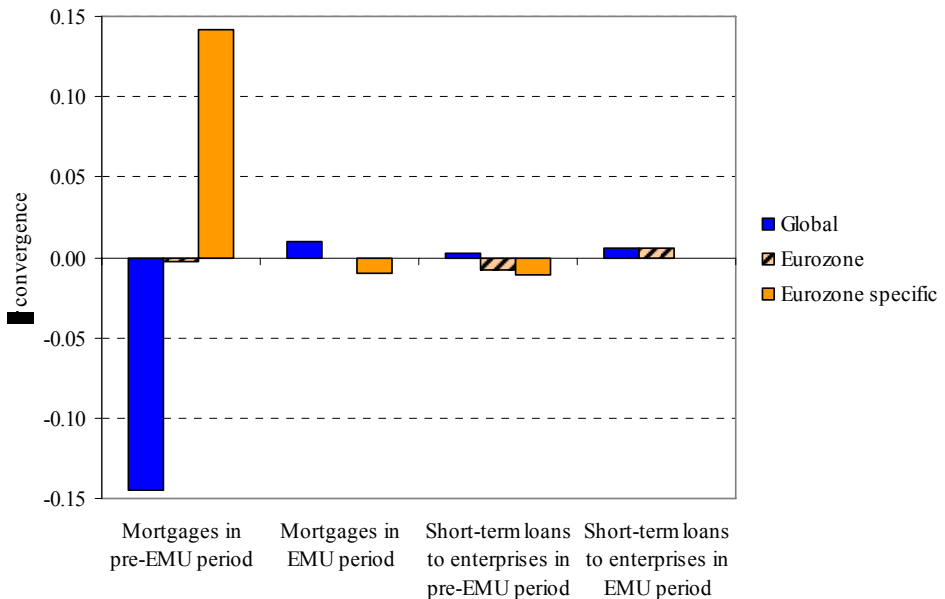
Panel B: β-convergence
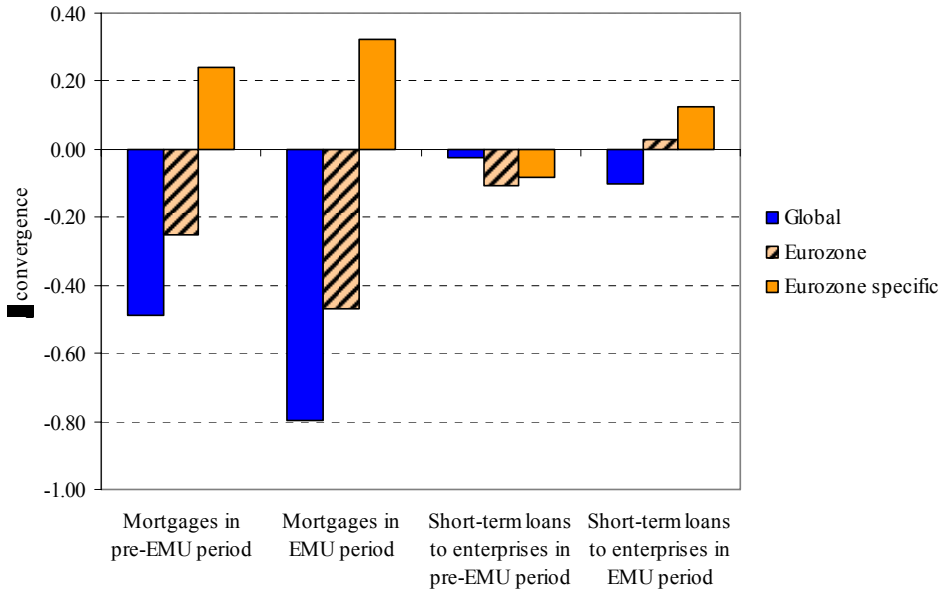
Notes: Bars in the negative regions indicate convergence whereas bars in the positive region indicate divergence. The black and hatched bars represent the total convergence in two regions, respectively and independently: global convergence and eurozone convergence. Based on these two measures, eurozone-specific convergence is now defined as eurozone convergence minus global convergence. Thus, if there is more convergence globally than in the eurozone (e.g. when the black bar is more negative than the hatched bar), then eurozone-specific divergence (e.g. a positive grey bar) is found. In contrast, if there is less convergence globally than in the eurozone (e.g. when the black bar is less negative than the hatched bar), then eurozone-specific convergence (e.g. a negative grey bar) is found.

Source: Based on data provided in Table 1 of Kleimeier & Sander (2006).

2.4.3   Interest rate pass-through: Monetary transmission, competition and integration

Pass-through studies are increasingly employed for assessing integration in the retail banking market. The underlying idea is as follows: if retail banking interest rates closely follow changes in monetary policy or market interest rates (or both), this will substitute for cross-border arbitrage as the national retail interest rates in the eurozone are then tied together. This pass-through under the condition of monetary integration produces the statistical artefact of evidence for or against integration. Moreover, in the presence of an integrated wholesale market, such as in the EMU, this

would signal a competitive retail banking market. Conversely, a limited pass-through of interest rates might point to a high degree of imperfect competition in retail banking (Cottarelli & Kourelis, 1994). And if the pass-through process is heterogeneous across countries, this could be interpreted as a limited institutional convergence process in European retail banking, which works against the LOOP.[13] It is in this sense that throughout Europe a more competitive banking market could contribute to a smooth and more homogenous monetary transmission.

The results of pass-through studies typically indicate considerable differences in the pass-through not only across bank lending and deposit rates but also across the countries of the eurozone. Furthermore, a substantial degree of short-term bank interest-rate stickiness is found. At the same time, many but not all studies find evidence of a less than full pass-through in the long term, which can be read as evidence of credit rationing phenomena. In addition, asymmetric adjustment of retail interest rates depending on the type of interest rate shock is regularly documented. Finally, it is often argued that the single currency could act as a unifying force that has the potential to make the pass-through faster, more complete and more homogeneous. One question addressed by an earlier pass-through study (Sander & Kleimeier, 2004) is particularly relevant in the context of market integration: To what extent has the response of retail interest rates to monetary policy rates become more similar across countries, i.e. under the single currency? Figure 2.16 presents a visual answer, which generally supports the no-no-and-maybe proposition obtained from the cointegration analyses of mortgage, consumer lending and short-term corporate lending markets: mortgage and consumer lending rates show a highly heterogeneous response to monetary policy.

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[13] The methodological details regarding pass-through analyses are presented in Box A3 in the Appendix. Most studies on eurozone pass-through are based on a variant of the pioneering work by Cottarelli & Kourelis (1994). Important contributions include BIS (1994), Cottarelli et al. (1995), Borio & Fritz (1995), Mojon (2001), de Bondt (2002), de Bondt et al. (2002), Sander & Kleimeier (2002), Toolsema et al. (2002) and Heinemann & Schüler (2003). Note that some pass-through studies select as the common factor those market interest rates that are most closely related to the retail interest rate under investigation (de Bondt, 2002; de Bondt et al., 2002; Baele et al., 2004). Other studies opt for a money market rate as the common (monetary policy) factor (Mojon, 2001; Heinemann & Schüler, 2003; Sander & Kleimeier, 2002, 2004; Toolsema et al., 2002).

Figure 2.16 Cross-country variations in the eurozone's pass-through process
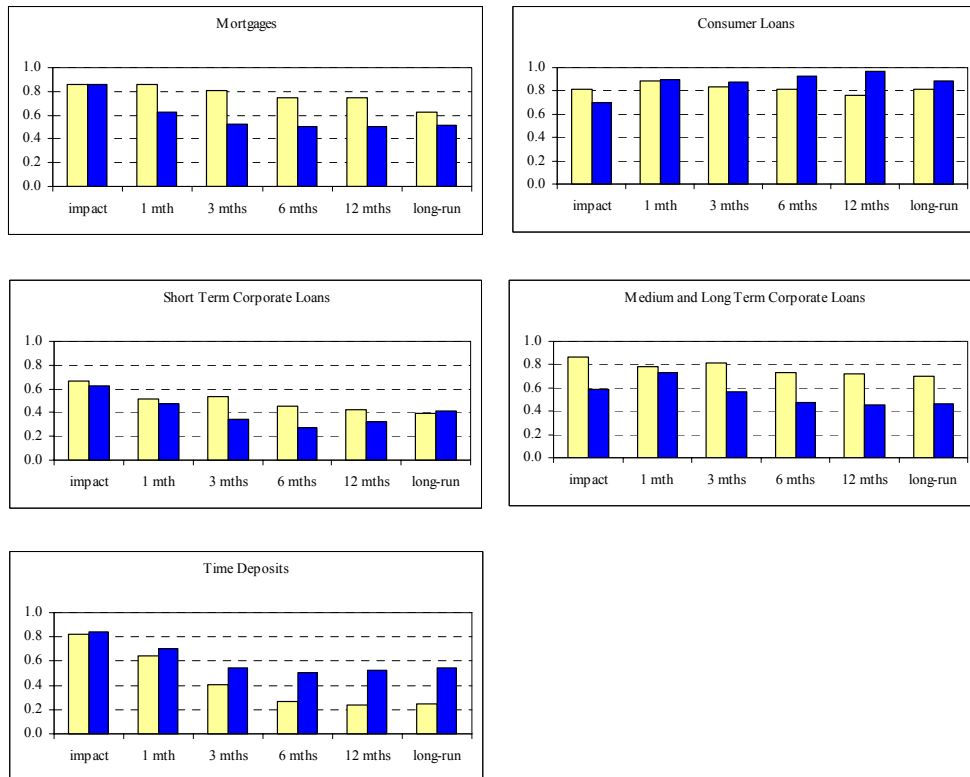
For consumer lending rates, the response to monetary policy rates is, however, most heterogeneous and even shows indications of increasing heterogeneity. In line with the growing signs of a more integrated, short-term corporate lending market, the pass-through is not only the fastest but also the most homogeneous one by far. Indeed, this homogeneity increases even further in the post-break period. Although improvements in the latter sense are also visible for longer-term corporate loans, the heterogeneity with respect to monetary policy impulses is still higher than it is for short-term loans. The Sander & Kleimeier (2004) study also uses the results of

pass-through estimates in second-stage regressions to shed light on the role of competition and integration for a more uniform monetary transmission. For the eurozone, it is argued that the evidence points to a lack of integration and in particular to the role of legal and cultural differences that may continue to preclude full convergence in the near future even after the introduction of the single currency.

With respect to the pass-through in the NMS, it is interesting to note that recent research (Opiela, 1999; Chmielewski, 2004; Crespo-Cuaresma et al., 2004; Horváth et al., 2004; Sander & Kleimeier, 2005) has shown that the pass-through is typically faster, more complete and more uniform in these countries. Moreover, in Sander & Kleimeier (2005) it is shown that the differences in the pass-through, i.e. in the price stickiness of retail interest rates in these countries, can largely be explained by variables describing the state of competition and the relative importance of foreign bank participation in these countries. Country-specific legal or cultural differences appear to play no critical role. In other words, if these countries managed to achieve market structures that are more similar (i.e. competition) the pass-through might also converge. This result stands in sharp contrast to the results for the eurozone member countries, where initial market characteristics go a long way to prevent convergence and foreign participation on a large scale. An interesting implication of this analysis is that conditional upon 1) a convergence of market structures in the NMS and 2) joining the eurozone, which could equate policy and market interest rates, the pass-through and thus retail interest rates would become relatively homogenous across the NMS.

2.4.4 Financial development and retail banking efficiency

In an excellent survey of the changing character of European finance, Rajan & Zingales (2003) argue that there is a general trend in Europe towards bank disintermediation and a shift towards more 'arm's length' transactions. The term 'arm's length' refers to the transaction between two unrelated parties who only rely on publicly available information, such as in corporate bond markets. This kind of transaction is contrasted with relationship finance, such as banking intermediation, which often builds on long-term relationships. Both systems do have their own merits and problems, including limitations in the access to market-based, arm's length finance for SMEs. According to Rajan & Zingales, relationship finance may

be better suited to financing physical capital investment while arm's length finance is hypothesised to be superior in financing human capital and innovation-intensive firms. Although we do not want to go too much into this discussion here, a potential implication for retail banking integration warrants attention. Since arm's length finance can both substitute and complement retail banking products, its development will have an important impact on the efficiency of retail banking. In a recent study for the IMF's World Economic Outlook (IMF, 2006), a financial index was constructed to reflect the development of "traditional banking intermediation", "new financial intermediation" and other, more general "financial market characteristics". The authors argue that this index is related to features of financial service products. As reflected in Figure 2.17, they show that higher scores in the financial index are related to more attractive features of financial products in the mortgage market.

Figure 2.17 Development of the banking market
Panel A: Financial index in 1995 versus 2004
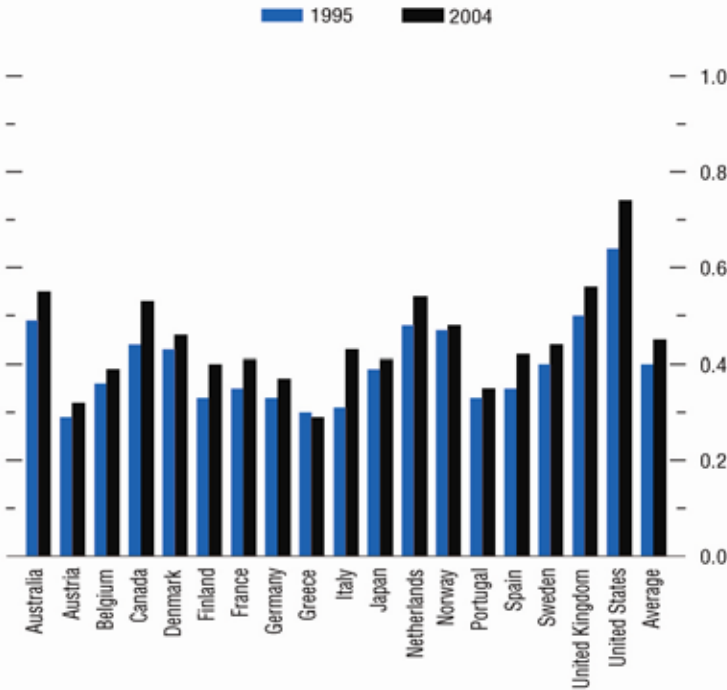
Panel B: Mortgage markets in 2004
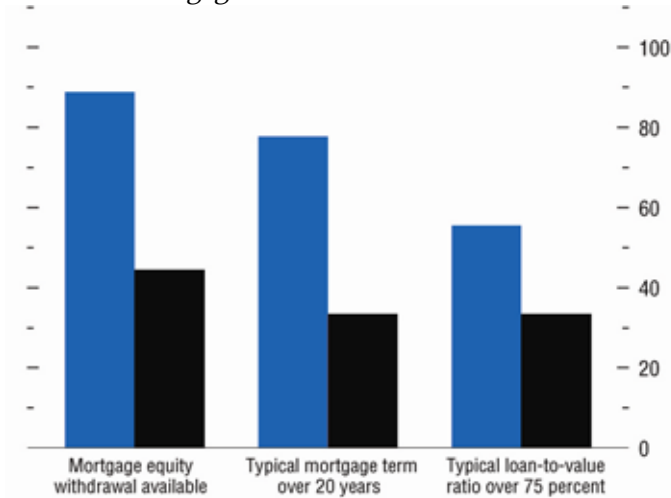
Notes: In Panel A, grey bars represent data for 1995 and black bars represent data for 2004. The index ranges from 0 to 1 with a higher value indicating more developed financial intermediation. In Panel B, grey bars represent countries in the upper half of the financial index (Australia, Canada, Denmark, Italy, the Netherlands, Norway, Sweden, the UK and the US) whereas black bars represent countries in the lower half of the financial index (Austria, Belgium, Finland, France, Germany, Greece, Japan, Portugal and Spain). The y-axis represents the percentage of countries where the mortgage market feature can be found.

Source: Panel A represents Figure 4.5 and Panel B represents Figure 4.6 from IMF (2006).

Also, and as we have argued and shown in this report, wholesale market integration has been a major driving force behind the observable, though yet limited integration process. For that reason, most integration effects were obtained in the eurozone in the phase leading up to monetary integration, which had a tremendous effect on wholesale market integration. A major lesson from the experience of the US is that this process can go further with additional wholesale market integration, especially with the emerging and quickly developing secondary credit markets and securitisation. We return to this issue in section 3.2.

In sum it appears that integration in the retail banking market is not only largely driven by events in the wholesale banking market, but also by 'financial development' in general. If this view is correct, it strongly argues in favour of an *overall assessment of retail banking that should be placed within a framework of overall financial development, comprising movements in banking and market-based finance with a particular emphasis on the interaction of both.*

3. POLICY IMPLICATIONS

3.1   General policy considerations

What policy implications can be drawn from the presented evidence? First, it is important that regulators take into account the natural limits to the integration of the retail banking market to avoid counter-productive over-harmonisation, which may damage the efficient workings of national markets (Barros et al., 2005). That being said, further steps to reduce artificial and political barriers to entry and thus to integration need to be considered. Second, as the evidence shows that the scope of integration by means of cross-border M&As is limited – at least in the short run – a renewed focus on competition and competition policy is highly desirable. This focus should be on open markets, e.g. low barriers to market entry, market contestability, reduced switching costs for retail customers and transparency (e.g. fee structure) in order to develop a more efficient retail banking market. Third, it has been shown that the growth of an efficient and complementary arm's length financial sector can provide substitute financial products and consequently a more competitive and efficient banking market in Europe. Fourth, the evidence points to the fundamental role of wholesale market integration in conjunction with a competitive environment for generating more retail market integration. This conclusion implies that more progress in the integration of the wholesale market might give a new impulse to that in the retail banking market. Two elements may be crucial here: 1) the development and implementation of a single European payment area (SEPA) and 2) the expansion of secondary loan markets and securitisation. Fifth, national supervision is often considered an obstacle to cross-border banking while at the same time more cross-border banking may question the adequacy of national supervision. In the following sections we discuss in more detail the chances and risks of securitisation and the implications of integration for supervision.

3.2   Securitisation

If the integration process is to a large extent being driven by the wholesale market, financial market forces could provide additional impetus to retail banking integration. This is so because retail banking relies on geographic proximity to the customer, given that retail lending is characterised by substantial information asymmetries and local banks have a comparative advantage in screening local borrowers. In such an environment of segmented markets, diversification opportunities for the banks' loan portfolios remain present as risk and return differ across national banking markets. A potentially powerful driver of increased integration could be the creation of a secondary market for loans, which has been a major force behind the integration of US mortgage markets. As recently noted by Fonteyne (2006, pp. 3–4),

> [W]hereas U.S. banks pass standardized risks on to the markets through securitisation and manage more profitable nonstandardized risks themselves, European banks keep the bulk of their assets on their books. They do so in part because capital markets are less developed, incomplete, or fragmented. Mortgage loans in the United States, for example, are mostly securitized (in mortgage-backed securities) and placed in a highly liquid market that attracts global investors. But in the EU, legal frameworks (and hence markets) for the securitisation of mortgage loans are country-specific, if they exist at all. These capital market constraints in turn hinder the integration of the retail-oriented banking markets and, more fundamentally, national economies.

The European Central Bank (2002) has also suggested that securitisation might provide additional integration effects. Securitisation in Europe is currently increasing but with only €150 billion it is still underdeveloped when compared with the US.[14] Therefore, a look at the effects that securitisation had on the US retail banking markets and here in particular on the mortgage markets can provide valuable lessons.

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[14] The legal and regulatory changes adopted during the 1990s, in particular the allowance of special purpose vehicles and financial vehicle corporations, were crucial in fostering the creation of many new financial instruments. This development has contributed to the growth of securitisation especially in Belgium, Spain and Portugal. Nevertheless, national patterns prevail and differences include the type of debt that is securitised (household versus corporate debt), the maturity of the created securities (short- versus long-term) and the relative quantities of securitised debt.

In the US, securitisation first occurred in the mortgage market in the 1970s. A second wave took place in 1980s, which also marked the establishment of the Government National Mortgage Association, the Federal National Mortgage Association and the Federal Home Loan Mortgage Corporation. Together these agencies took on a leading role in the development. Private securitising firms have joined the market and securitisation has been steadily rising. Although only 5% of consumer loans were securitised in 1989, this percentage had risen to 30% in 2000. Major types of securitised loans now include student, manufactured housing, home equity, credit card and auto loans. Securitisation is still most pronounced in the mortgage market, however, where 46% of all mortgages were securitised in 2000 (Estrella, 2002).

Two main types of benefits from mortgage securitisation have been advocated for the US and could hence eventually be expected in Europe: first, benefits from the deepening of the mortgage market; and second, benefits from the broadening of the mortgage market. Regarding the first benefit, it appears that increased securitisation is correlated with lower interest rate spreads on mortgages. Kolari et al. (1998, p. 679) find that "a 10% increase in the level of securitization as a proportion of total mortgage originations reduces the yield spread on home mortgage loans by as much as 20 basis points in the long run". Yet, some authors question the causality pattern and argue that low spreads may have led to more securitisation.[15]

Regarding the second benefit, Katz (1997) argues that cross-sectional dispersion in mortgage rates in the US is negatively related to securitisation. Whereas regional mortgage rates differed by 100 basis points or more, they have become much more homogeneous. She believes that banks in the US use securitisation to reduce their sensitivity to local economic shocks. Owing to their superior knowledge of market conditions, property values and the creditworthiness of borrowers, banks still concentrate their loan origination in specific regions or industries. These loans do not stay on the balance sheet, however, but are securitised and sold to banks anywhere in the country. As a result, "[m]oney can flow from regions with idle deposits to those with excess loan demand, and thus mortgage rates are more similar across the country".

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[15] See e.g. Estrella (2002), who argues on the basis of a study by Heuson et al. (2001) that low mortgage rates cause more securitisation. As such, the negation correlation might not necessarily have to be interpreted as consumer benefits.

This US evidence implies that increasing securitisation may help to generate the yet elusive Cecchini benefits and could eventually lead to more convergence of retail lending rates in a market where banks and bank lending remain domestic in nature. Still, as noted previously, the first effect is disputed and might require further research. Moreover, eventual benefits would have to be weighted against potential costs. For example, securitisation is believed to affect the stability of the banking sector. While on the one hand, stability is increased as banks can hold more diversified portfolios and are less dependent on the local economy (Katz, 1997), stability is on the other hand decreased if securitisation is used for regulatory capital arbitrage (Jones, 2000) or leads to the insufficient monitoring of borrowers.[16] These risks have become clearly visible in mid-2007, as concerns about the potentially widespread default of securitised sub-prime US loans and reduced liquidity in the interbank markets have reached such an extent that central banks have decided to inject substantial amounts of liquidity into the market.

Finally, securitisation can have an impact on the effectiveness of monetary policy transmission, notably with respect to the pass-through mechanism. Estrella (2002) finds a stronger effect of monetary policy on mortgage rates as a result of increased securitisation. But as securitisation allows banks to continue their lending activities even under monetary tightening because securitised loans do not need to be funded by deposits, monetary policy seems to have very little effect on output. Kuttner (2000) provides empirical evidence that banks do indeed use securitisation as a monetary policy buffer. He finds that in their reaction to monetary policy, securitisation volume moves in the opposite direction to bank loan volume. Accordingly, consumers might benefit as credit crunches are avoided. At the same time, the impact of securitisation on the protection of consumers is an additional issue that requires regulatory scrutiny.

In sum, while securitisation can bring tremendous benefits in terms of integrating markets and making markets more competitive, there can be enormous downside risks in terms of financial stability that strongly suggest the need for appropriate financial regulation and supervision.

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[16] Lisieri et al. (2001) report evidence of a free-rider problem in UK mortgage markets in the 1980s.

3.3   Ownership and supervision

The recent wave of M&As in European banking has prompted concern about the adequacy of the present national supervision among both academics and policy-makers. Furthermore, the model of Societas Europaea and the related trend towards cross-border branching requires specific regulatory attention. In this respect, Dermine (2006, p. 57) warns against putting "the cart before the horse", i.e. he urges solving the regulatory issues of who will supervise and who will provide deposit insurance now and not after an integrated market has already emerged. He argues that the 'home-country' principle, which in the past was functional in promoting banking market integration, may not be the first-best solution in the future for guaranteeing both the efficiency and stability of an integrated European banking market.

Consequently, many observers maintain that the question of ownership lies "at the heart of debates about the integration of financial markets" (Barros et al., 2005, p. 4). According to this view, the elimination of barriers to trade will favour the least-cost supplier at the expense of the relatively less efficient one. Thus, as always in international trade, the more efficient foreign supplier will eventually replace the local supplier. As banking is a service product, some cross-border activity is required. Given also that retail banking is a localised business, it is most likely that banks and not customers will cross borders. Barros et al. (2005) point to two consequences of foreign ownership with respect to retail banking. First, foreign banks and their respective national supervisors under the principle of home-country supervision may be more concerned with the situation at home than in the host country. This tendency may become important in the case of adverse shocks. While it would not be so much of a problem if foreign banks come from a country that belongs to the same monetary system, it is a concern if banks come from a different monetary system. These latter banks, their regulators and monetary authorities may pay more attention to the home-country situation than to preserving activities in host countries. Financial stability in the host country could in turn be affected. Second, as relationship banking is a common feature in many Continental European countries, the authors also argue that an expanded foreign presence may favour transaction banking at the expense of relationship banking.

If integration were therefore driven by a substantial increase in cross-border banking and cross-border M&As, the issue of supervision would

come to the fore. The question emerges as to whether one can simultaneously preserve 1) a stable financial system in the presence of 2) financial integration and still preserve 3) national financial supervision. Schoenmaker (2005, p. 399) holds that there exists a "trilemma of financial supervision" that allows the pursuit of only two of these three incompatible objectives at the same time (see Figure 3.1).

Figure 3.1 The trilemma of financial supervision: Choose two and only two

1. Stable financial system

2. Integrated financial market　　　　　**3. National financial supervision**
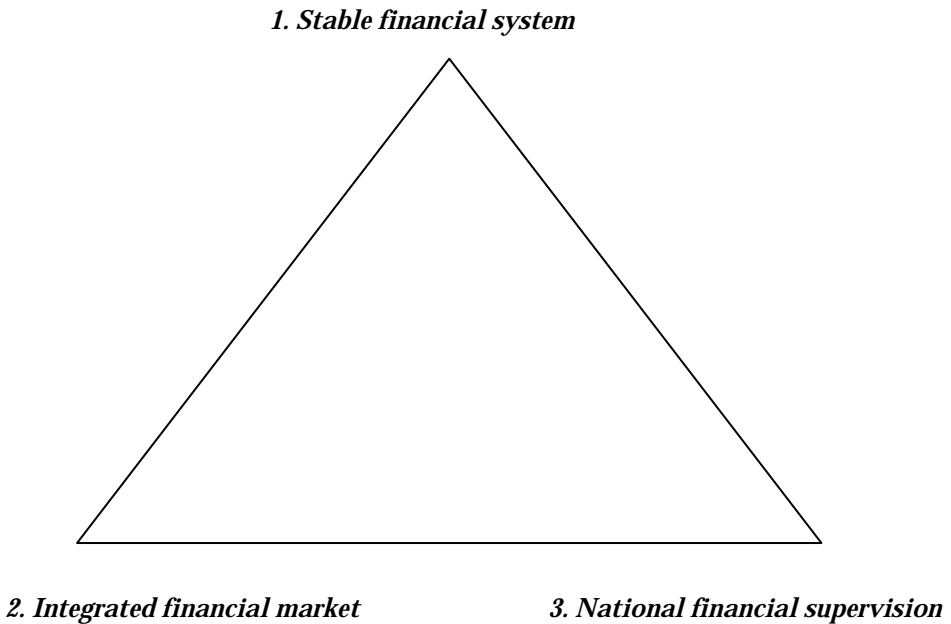
Source: Schoenmaker (2005, p. 399).

We do not aim here at discussing the pros and cons of national financial supervision, which have been debated extensively in the literature. Rather, our point is that the trilemma is a concern that national policy-makers have to face when banking market integration is predominantly achieved by cross-border M&As, cross-border branching, Societas Europaea, etc. If, however, the effects of integration are achieved by a combination of wholesale integration, low entry barriers and hence contestable and competitive markets, banking markets can essentially remain national as far as ownership is concerned, because the incentive to enter a highly competitive market is limited.

Thus, in principle a pro-competitive policy can prolong the half-life of national supervision, while national attempts to protect the national financial industry may ultimately undermine it. Yet given that in practice national and local banks often possess almost natural competitive advantages, one should not take this argument too far, especially when bank customer mobility is rather low (see section 2.4.1). In this respect, one additional asymmetry deserves attention. Whereas in countries with highly developed financial systems national banks clearly have competitive advantages, this is not true for the NMS as can be witnessed by the high degree of foreign bank penetration in these countries. As a result, the trilemma options may be viewed quite differently by policy-makers across the NMS, the EU-15 and within the eurozone.

4. CONCLUSIONS

Integration in the European retail banking market is still far from perfect and may never become perfect. Particularly retail services, such as relationship lending to small businesses, might always be provided by local banks that best understand the local market, language and culture, and which have superior information about local businesses. In the new EU member states the situation is completely different, as no competitive national banking system was present at the time when the transition started. Thus, foreign bank participation became a vital part of the financial sector's transformation process. Keeping in mind these differences, several conclusions emerge from the review of the academic evidence:

1) It is important to understand and correctly identify the economic limits of integration in retail banking to avoid 'over-harmonisation'.

2) Integration has been strongest where markets are most competitive and the least plagued by imperfections. In this sense, among the lending markets corporate lending (where competition is stronger) is the most integrated, followed by mortgages (where collateral reduces asymmetric information problems); consumer credit is the least integrated market. On the deposit side, time deposit markets, where switching costs are less significant, are the most integrated ones, while current account markets appear to be the least integrated.

3) As most integration took place in the 1990s, the process was largely driven by the earlier integration of wholesale financial markets and by means of the introduction of the single currency. Since wholesale integration has largely been accomplished, the integration process in retail banking seems to have lost momentum – at least until very recently.

4) As a result, the still-segmented retail markets provide diversification opportunities for banks' loan portfolios as risk and return differ across national banking markets. This may explain the recent increase in cross-border banking. Some larger mergers have taken place and more are expected to follow. The model of Societas Europaea and the related trend towards cross-border branching requires particular regulatory attention and puts the principle of home-country supervision under increasing pressure. Yet it remains to be seen how far this process of internationalisation by cross-border banking will go. Two reasons can be mentioned:

   a) The elusive evidence in favour of economies of scale in retail banking may limit the extent of cross-border banking unless banking products become more commodity-like.

   b) Given the evidence of the competitive advantages of home-country banks, the potential of integration through cross-border banking may be further limited – at least for countries with competitive national banking systems. In the new member states the situation is different and foreign banks play a much larger role in integrating banking markets. Accordingly, the regulatory challenges are much more pressing in these countries.

5) Because of the tremendous divergences in *real* retail interest rates, which are at least partly the result of substantial inflation differentials, the relation between product prices in retail banking and other product prices warrants attention, as successful price reduction in product markets can lead to increases in real retail interest rates. As such an integrated approach to all segments of the single market is called for.

6) Consequently, competition in retail banking also deserves special attention. As the emphasis on economies of scale as expressed in the single market project now appears to many observers as over-excessive, recently the role of open markets and market entry has rightly been highlighted (Sapir et al., 2004; Delgado, 2006). It is also in this respect that the openness of markets may not simply mean openness towards European markets. A broad-based analysis of competitive forces and market contestability on a regional and global scale, with proper benchmarking determining which effects can be attributed to regional policies, could be very helpful for achieving this objective.

7) Integrating wholesale markets in conjunction with developing and preserving competitive banking markets are fundamental to 'produce' integrated market effects. Two mechanisms are the most relevant: the transmission of monetary impulses onto retail bank (lending) interest rates and well-functioning capital markets. Regarding the first mechanism, competition and competition policy in national markets remain highly significant issues, as price stickiness is a major feature of European retail banking. As the pass-through becomes faster and more homogeneous across countries, it will create a de facto integrated market. The same is true with respect to the second issue, particularly regarding the emerging and fast-developing secondary credit markets. Also in this area, European financial regulation and supervision will have to play an increasingly prominent role in the future.

8) As competition-cum-wholesale integration is essential to 'producing' integration effects it can substitute for cross-border banking. In turn, the more effective this channel of integration becomes the less cross-border banking will be induced or needed to create a single market and the less pressing is the need to reconsider the current system of national regulation. Or to put it the other way around, the less competitive national banking markets are, the more they will attract foreign bank entrants and the more the system of national regulation and supervision will come under pressure.

9) Finally, integration of the retail banking market is ultimately a means to achieve a competitive and growth-enhancing financial system in Europe. In this respect, retail banking is a part, but not the only part of the story. On the one hand, the emergence of other financial markets, especially arm's length finance, complements traditional banking. On the other hand, these developments bring important accompaniments (such as secondary markets) and competitive pressure to retail banking. Together they call for joint monitoring of both retail banking and its interaction with the development and the stability of the whole financial system.

In sum, retail banking is still fragmented. Yet the traditional approach of relying mainly on economies of scale and integration through single market harmonisation and cross-border banking may have run into diminishing returns by now. A new emphasis on market entry and competition as well as on the interaction of the retail banking market with a broad-based

concept of financial market development is important and is increasingly being advocated in the academic literature. The creation of an integrated European financial market requires that both retail and capital markets advance jointly. A broad-based perspective on financial market development with a strong eye on competition in retail banking without compromising financial stability may thus be most the functional in terms of the growth benefits for an integrated Europe.

Of course, these benefits may also come with repercussions that may warrant additional attention, such as financial stability issues and a distributional impact within societies. While these issues are beyond the limits of this report, the existing evidence on the growth-enhancing effects of an efficient financial system should convince policy-makers that Europe could gain tremendously by giving high priority to financial sector development on Europe's future economic policy agenda.

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APPENDIX

Box A1. Convergence methodology

To analyse convergence in its simplest form, the following two regressions for σ- and β-convergence can be estimated:

$$SD_t = a_1 + b_1\, T + \varepsilon_t \tag{1.1}$$

$$\Delta z_{c,r,t+12} = d_1\, z_{c,r,t} + \varepsilon_{c,r,t} \tag{1.2}$$

In equation (1.1) T indicates a trend. In equation (1.2) $z_{c,r,t}$ is defined as the difference in month t between the retail interest rate of country c and the average retail interest rate or margin in region r to which country c belongs. The change in this deviation is measured by $\Delta z_{c,r,t+12} = z_{c,r,t+12} - z_{c,r,t}$. $\Delta z_{c,r,t+12}$ indicates the change over the coming 12 months.

To investigate whether convergence continued or even increased under the single currency, dummies can be included in the σ- and β-convergence regressions respectively, such that

$$SD_t = a_1 + a_2\, D_{EMU} + b_1\, T + b_2\, T\, D_{EMU} + \varepsilon_t \tag{1.3}$$

$$\Delta z_{c,r,t+12} = d_1\, z_{c,r,t} + d_2\, z_{c,r,t}\, D_{EMU} + \varepsilon_{c,r,t} \tag{1.4}$$

where D_{EMU} is the dummy equal to 1 for observations t during the EMU period. A negative b_2 or d_2 coefficient indicates *additional* convergence during the EMU period.

To benchmark the convergence process in the eurozone against global trends, a difference-in-differences (DD) analysis is employed based on the following panel regressions:

$$SD_{r,t} = a_1 + a_2\, D_{EMU} + a_3\, D_r + a_4\, D_{r,EMU} + b_1\, T + b_2\, T\, D_{EMU} + b_3\, T\, D_r + b_4\, T\, D_{r,EMU}$$
$$+ \varepsilon_{r,EMU,t} \tag{1.5}$$

$$\Delta z_{c,r,t+12} = d_1\, z_{c,r,t} + d_2\, z_{c,r,t}\, D_{EMU} + d_3\, z_{c,r,t}\, D_r + d_4\, z_{c,r,t}\, D_{r,EMU} + \varepsilon_{c,r,t} \tag{1.6}$$

Box A1, cont.

Two additional dummies are included: D_r is a cross-sectional dummy equal to 1 if the dependent variable is measured for region r = eurozone. $D_{r,EMU}$ is a compound dummy equal to 1 for region r = eurozone and for observations belonging to the EMU period. As such, SD and Δz are calculated for eurozone and non-eurozone countries separately. σ- and β-convergence can now be differentiated by region and period based on the estimated coefficients.

Source: Sander & Kleimeier (2005).

Box A2. Cointegration methodology

To establish that there exists a certain long-term relationship – either bilateral between national interest rates or between national interest rates and the weighted average of the remaining eurozone countries, such as the one indicated in equation (2.3) – we have to undertake *cointegration testing*. Following Engle & Granger (1987), a setting where time series of individual variables "can wander extensively and yet some pairs of series may be expected to move so they do not drift too far apart" is best being studied in the context of a cointegration analysis. The reason for the need to use this methodology is that simple regression analyses of equations like (2) may lead to spurious results when time series such as interest rates follow a so-called 'random walk'. The underlying idea of cointegration is that such non-stationary time series, however, can move apart in the short run, but will be brought back by market forces to an equilibrium relation in the long run. The cointegration methodology applied in this study closely follows the approach promoted by Engle & Granger (1987) and proceeds in three steps. First, the time series must be proven to be unit roots. Only then can the cointegration vector be estimated. Finally, once cointegration has been established, the corresponding error correction model can be estimated.

To establish whether the interest rates are unit roots, or I(1), two test statistics, a t-statistic and an F-statistic, are employed based on regressions on levels as well as first differences of the underlying series. Next to lagged observations of the lending rate L in question both also include a trend variable T:

Box A2, cont.

$$\Delta L_t = \eta_0 + \eta_1 L_{t-1} + \eta_2 \Delta L_{t-1} + \eta_3 T + \varepsilon_t \qquad (2.1)$$

$$\Delta^2 L_t = \eta_0 + \eta_1 \Delta L_{t-1} + \eta_2 \Delta^2 L_{t-1} + \eta_3 T + \varepsilon_t \qquad (2.2)$$

The null hypothesis states that the series follow random walks. For the t-statistic, this corresponds to a null hypothesis of $H_0: \eta_1 = 0$ and for the F-statistic to a null hypothesis of $H_0: \eta_1 = \eta_3 = 0$. We fail to reject the null hypothesis of a random walk if the calculated t or F values are smaller in absolute terms than the critical values. Thus, as a precondition for cointegration, we have to accept the null hypotheses for equation (2.1) but reject them for equation (2.2).

Once the I(1) characteristic has been established, cointegration testing can commence. We start with estimating the cointegration regression using the national lending rate L_{nat} for the individual country as the dependent variable and the weighted average rate for the remaining eurozone countries L_{EU} as the independent variable (or in the case of bilateral cointegration the national lending rate of another country $L_{nat2,t}$):

$$L_{nat,t} = a + b L_{EU,t} + u_t \qquad (2.3)$$

A first cointegration testing procedure relies on the Durbin-Watson statistics (DW). The null hypothesis of no cointegration can be rejected when the calculated DW values resulting from the regression of equation (2.3) are larger than the critical values. As Engle & Granger point out, the Durbin-Watson test can be used as a good but only approximate indicator for cointegration and should be followed by a more specific testing procedure such as the Dickey-Fuller (DF) and augmented Dickey-Fuller (ADF) tests. The Dickey-Fuller test is based on the residuals of the cointegration regression:

$$\Delta \hat{u}_t = -\delta_0 \hat{u}_{t-1} + \varepsilon_t \qquad (2.4)$$

where the t-statistic for the estimated coefficient $-\delta_0$ provides an indication regarding the cointegration of the two series. In particular, the null hypothesis of no cointegration can be rejected when the t-statistic is larger in absolute value than the critical value.

The augmented Dickey-Fuller test is obtained in a two-step procedure from the regression:

Box A2, cont.

$$\Delta\hat{u}_t = -\delta_0 \, \hat{u}_{t-1} + \sum_{i=1}^{4} \delta_i \, \Delta\hat{u}_{t-i} + \varepsilon_t \qquad (2.5)$$

In the first step, equation (2.5) is estimated including all four lags of $\Delta\hat{u}_{t-i}$. In the second step, equation (2.5) is re-estimated including only the significant lags of $\Delta\hat{u}_{t-i}$ from the first step. Now, the null hypothesis of no cointegration can be rejected when the t-statistic for the estimated coefficient $-\delta_0$ is larger in absolute value than the critical value.

Once the existence of a long-term relationship, i.e. cointegration is established, one can investigate the short-term dynamics of interest rates by estimating the corresponding error correction model (ECM). This model will provide an estimate of the speed of adjustment with which the system returns back to the long-term equilibrium. To find the correct specification of the ECM, first an unrestricted vector autoregression (UVAR) is estimated based on the regression:

$$\Delta L_{nat,t} = \lambda_0 + \lambda_1 L_{nat,t-1} + \lambda_2 L_{EU,t-1} + \sum_{i=1}^{4} \lambda_{nati} \Delta L_{nat,t-i} + \sum_{i=1}^{4}$$

$$\lambda_{EUi} \Delta L_{EU,t-i} + \varepsilon_t \qquad (2.6)$$

From this regression, the significant lagged first differences of the exogenous and endogenous variables are identified and included in the final ECM in combination with any error correction terms ECT obtained from the estimated errors that were found to be significant in the cointegration regression

$$\Delta L_{nat,t} = \varphi_0 + \varphi_1 \hat{u}_{t-1} + \sum_{i=1}^{4} \varphi_{nati} L_{nat,t-i} + \sum_{i=1}^{4} \varphi_{EUi} L_{EU,t-i} + \varepsilon_t \quad (2.7)$$

The estimated coefficient φ_1 of the ECT measures the speed of adjustment. For example, an estimated φ_1 of -0.2 indicates that if there is a shock to the national lending rate $L_{nat,t}$, which raises its value relative to the equilibrium relationship to the cointegrated EU-wide lending rate $L_{EU,t}$, then one-fifth of the divergence is eliminated in the following period.

Source: Kleimeier & Sander (2002).

Box A3. Pass-through methodology

Traditionally, the pass-through process has simply been modelled as a VAR process (Cottarelli & Kourelis, 1994):

$$BR_t = \beta_0 + \sum_{i=1}^{k^*} \beta_{BR,i} BR_{t-i} + \beta_1 M_t + \sum_{i=1}^{n^*} \beta_{M,i} M_{t-i} + \varepsilon_t \qquad (3.1)$$

where BR_t and M_t are lending and market rates, respectively, and k^* and n^* indicate the optimal lag lengths. Note that whenever an optimal lag length has to be determined, the minimum AIC criterion is used, allowing for a maximum of four lags. Nevertheless, it is important to recognise that the time series for interest rates typically exhibit an I(1) property. In this case, the empirical pass-through model is best estimated using first differences:

$$\Delta BR_t = \sum_{i=1}^{k^*} \beta_{BR,i} \Delta BR_{t-i} + \beta_1 \Delta M_t + \sum_{i=1}^{n^*} \beta_{M,i} \Delta M_{t-i} + \varepsilon_t \qquad (3.2)$$

This specification avoids spurious regression problems but leads to a loss of information about long-term relationships. Fortunately, this information can be recovered if BR and M are cointegrated. The VAR then needs to be augmented by an (lagged) error correction term (ECT):

$$\Delta BR_t = \sum_{i=1}^{k^*} \beta_{BR,i} \Delta BR_{t-i} + \beta_1 \Delta M_t + \sum_{i=1}^{n^*} \beta_{M,i} \Delta M_{t-i} + \beta_{ECT} ECT_{t-1} + \varepsilon_t \qquad (3.3)$$

The ECT measures the deviation from the long-term equilibrium, which can be obtained from the estimated error of the cointegration regression:

$$BR_t = \theta_0 + \theta M_t + u_t \qquad (3.4)$$

The appropriate version of the pass-through model as either equation (3.1), (3.2) or (3.3) depends on the time series and cointegration properties of the interest rate series. In all specifications, the impact multiplier is estimated by the coefficient β_1. A value of less than 1 indicates sluggish adjustment, also known as lending rate stickiness. The long-term relationship between market rates and retail rates is given by equation (3.4) and can be interpreted either as a cointegration relationship or as the long-term solution of the VAR. The long-term multiplier θ can be directly obtained from estimating equation (3.4) if the rates are cointegrated. Otherwise, the long-term multiplier has to be calculated from (3.1) or (3.2) as:

Box A3, cont.

$$\theta = \frac{\beta_1 + \displaystyle\sum_{i=1}^{n^*} \beta_{M,i}}{1 - \displaystyle\sum_{i=1}^{k^*} \beta_{BR,i}} \tag{3.5}$$

A full pass-through in the long run is reflected by $\theta=1$. An imperfect pass-through ($\theta<1$) could be caused by a less than perfect elasticity of demand for banking products, the existence of market power, a lack of market contestability, switching costs or information asymmetries. If the long-term pass-through is found to be overshooting ($\theta>1$) in lending markets, this can be interpreted as a situation where banks increase lending rates to compensate for higher risks instead of rationing credit.

Given the major developments in the eurozone since 1992, the long-term relationship may be subject to structural changes. Instead of exogenously postulating a break point and then testing for its presence, the presence and timing of the break can be determined endogenously by estimating a supremum F (supF) test for equation (3.4). This test can be interpreted as a rolling test where standard Chow tests are conducted for a series of different break points, which move through the mid-80% of the sample period. For details on this test see Andrews (1993), Diebold & Chen (1996) and Hansen (1992). SupF equals the largest Chow F-statistic and is compared with critical values as reported by Hansen (1992). On the basis of these tests, pre- and post-break periods can be constructed for every national retail interest rate. This allows the researcher to obtain additional information on the timing of structural changes and to estimate pass-through models for break-free sample periods.

While most pass-through studies focus on symmetric adjustment towards the long-term equilibrium, Sander & Kleimeier (2002) advocate that threshold and asymmetric adjustment mechanisms should both be considered for two main reasons. First, retail rate adjustment patterns in the eurozone are indeed frequently either asymmetric or occur only beyond a certain threshold. Therefore, they should not be ignored. Second, using models with asymmetries allows us to detect cointegration in cases where there are asymmetries and where other methods would thus fail to detect cointegration and wrongly re-direct the researcher to the pass-through model of equation (3.2).

Box A3, cont.

Five asymmetric specifications for the adjustment of interest rates are considered. We start by considering the symmetric pass-through model. Here the ECT is defined as

$$ECT_{t-1} = u_{t-1} \tag{3.6}$$

and cointegration testing is based on the Durbin–Watson (DW), Dickey–Fuller (DF) and augmented Dickey–Fuller (ADF) tests. As the first asymmetric model, we consider the threshold autoregressive model (TAR^0) developed by Tong (1983). The model distinguishes whether the explained interest rate is above or below its equilibrium level. Hence, the TAR^0 allows for asymmetric adjustment depending on the sign of the equilibrium deviation. For example, if the money market rate decreases without an immediate adjustment of the lending rate, we obtain a positive realisation of the error term u_t. When in this case the autoregressive decay is faster than in the case of money market rate increases, the lending rate adjustment is faster downwards than upwards. For this TAR^0 model, the ECT is defined as

$$ECT_{t-1} = I_t u_{t-1} + (1 - I_t) u_{t-1} \tag{3.7}$$

where I_t represents a Heaviside indicator for different states of u_{t-1} such that

$$I_t = \begin{cases} 1 & \text{if} & u_{t-1} \geq 0 \\ 0 & \text{if} & u_{t-1} < 0 \end{cases} \tag{3.8}$$

Using this definition we estimate equation (3.9):

$$\Delta u_t = I_t \rho_1 u_{t-1} + (1 - I_t)\rho_2 u_{t-1} + \sum_{i=1}^{m^*} \rho_{2+i} \Delta u_{t-i} + \varepsilon_t \tag{3.9}$$

Cointegration testing takes the form of a modified ADF test. The null of no cointegration is rejected if the estimated F-statistic for H_0: $\rho_1 = \rho_2 = 0$ is statistically significant based on critical values provided by Enders & Siklos (2001). If cointegration is established, an F-test for H_0: $\rho_1 = \rho_2$ indicates the presence of asymmetry.

The second asymmetric model (TAR*) is a modification of the TAR^0 in the sense that the threshold is now allowed to deviate from zero. The rationale is that retail rates may adjust differently to a disequilibrium once a certain minimum deviation in one direction is exceeded. For the TAR* model, the Heaviside indicator in conjunction with equation (3.7) is defined as

Box A3, cont.

$$I_t = \begin{cases} 1 & \text{if} & u_{t-1} \geq a_0^* \\ 0 & \text{if} & u_{t-1} < a_0^* \end{cases} \qquad (3.10)$$

Following Chan (1993), the optimal threshold a_0^* is found by searching over the mid-80% of the distribution of u_t and selecting the model for which the residual sum of squares is minimised. For both the TAR* and the following B-TAR* model, the optimal lag length m^* of the TAR^0 specification is used. Cointegration and asymmetry testing proceeds with the above-described F-tests.

The third variation is a Band-TAR model (B-TAR*), which can reflect interest rate stickiness, driven by the menu-cost behaviour of banks, as well as interest rate smoothing. For example, menu-cost behaviour could be relevant if cointegration is found only outside a band bordered by a_0^* and $-a_0^*$. For the B-TAR* model, the Heaviside indicator in conjunction with equation (3.7) is now defined as

$$I_{jt} = \begin{cases} I_{1t} = 1 & \text{if} & u_{t-1} \geq a_0^* & \text{and} & 0 & \text{otherwise} \\ I_{2t} = 1 & \text{if} & |u_{t-1}| < a_0^* & \text{and} & 0 & \text{otherwise} \\ I_{3t} = 1 & \text{if} & u_{t-1} \leq -a_0^* & \text{and} & 0 & \text{otherwise} \end{cases} \qquad (3.11)$$

while equation (3.9) is modified to

$$\Delta u_t = I_{1t}\rho_1 u_{t-1} + I_{2t}\rho_2 u_{t-1} + I_{3t}\rho_3 u_{t-1} + \sum_{i=1}^{m^*} \rho_{3+i}\Delta u_{t-i} + \varepsilon_t \qquad (3.12)$$

The F-tests for cointegration and asymmetry are now applied to all three coefficients ρ_j.

Finally, the fourth and fifth asymmetric models represent momentum threshold autoregressive (M-TAR) models. In the TAR models, the autoregressive decay always depends on the degree of deviation from equilibrium. In contrast, in the M-TAR approach the adjustment speed depends on how fast the rates move away from or towards equilibrium. As such, M-TAR adjustment can reflect the behaviour of banks that attempt to smooth out large changes in the market rate. In this case, the Heaviside indicator depends on the change in the error correction term Δu_t such that

Box A3, cont.

$$I_t = \begin{cases} 1 & \text{if} & \Delta u_{t-1} \geq a_0 \\ 0 & \text{if} & \Delta u_{t-1} < a_0 \end{cases} \qquad (3.13)$$

The ECT is defined accordingly. The optimal lag length of the M-TAR[0] model is used for the M-TAR* model. In a manner similar to the TAR[0] and TAR* specifications, M-TAR models can either be estimated with a threshold $a_0 = 0$ leading to the M-TAR[0] specification or can be optimised at $a_0 = a_0* > 0$ leading to the M-TAR* specification.

The objective of this methodology is to obtain the optimal pass-through model rather than arbitrarily selecting one. As such, break-free sub-periods are identified. Then one proceeds with unit root testing. If the rates are I(0), the pass-through model is estimated as in equation (3.1). If the rates are I(1), all five asymmetric TAR-type models are estimated and the best asymmetric model is selected based on the AIC criterion and this best model is tested for asymmetric cointegration. If asymmetric cointegration is confirmed, the pass-through model is estimated as in equation (3.3) with the appropriate asymmetric ECT. If asymmetric cointegration is rejected, symmetric cointegration testing is required and – if confirmed – symmetric ECT is included in the pass-through model of equation (3.3). If symmetric cointegration is also rejected, the pass-through model is estimated according to equation (3.2) without any ECT. Finally, based on the selected pass-through, model multipliers can be obtained for a variety of positive and negative interest rate shocks.

Source: Kleimeier & Sander (2004).