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**Integration in euro area
retail banking markets –
convergence of credit
interest rates**

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Abstract

Since the introduction of the single currency in 1999, major progress has been made towards achieving an integrated European capital and financial services market. Available evidence suggests, nevertheless, that the degree of integration varies greatly depending on market segment. Retail banking markets are generally seen to be much less integrated than other segments of financial markets. Most consumers still buy retail financial services from domestic suppliers, cross border entry of financial services firms is rare - even if it is growing - and the range of products available or other terms differs substantially across euro area member countries.

The purpose of this paper is to assess integration of retail banking in the euro area from January 2003 to May 2006. The empirical analysis makes use of a monthly panel of recently published harmonised interest rates from euro area monetary financial institutes. We use two common measures of convergence, namely β - and σ -convergence, to assess the speed and degree of integration. Tests for convergence are based on a panel unit root test.

The tests provide evidence of a process of convergence in retail banking credit interest rates for households and non-financial corporations and show that convergence has continued also recently. Thus, even if there are substantial cross country differences in interest rate levels, the progress towards integration is observable.

1 Introduction

The current degree of financial integration in Europe varies between market segments.¹ The money market has been almost fully integrated since the introduction of the euro. Also the repo market as well as government and corporate bond markets are highly integrated. Progress has also been made in the integration of euro area equity market, where equity returns are increasingly determined by common factors. As regards the integration in European banking markets, they are generally seen to be much less integrated.²

Cross-border activities have increased significantly in inter-bank and wholesale business, but in retail banking integration measured as cross-border activity is still limited. The share of euro area cross-border Monetary Financial Institutions (MFI) loans granted to non-MFIs is around 4 % of total loans, while the share of cross-border loans in wholesale business is around 25 % at present. The promotion of financial integration of Europe's retail banking market has become an important issue for the Eurosystem and for the EU in the post-FSAP (Financial Services Action Plan) era.³

The purpose of this paper is to assess integration of retail banking in the euro area by using price-based indicators constructed from newly harmonised Monetary Financial Institutions (MFI) interest rate (MIR) data across euro area member countries. The harmonised monthly interest rate data starting from January 2003 make it possible to analyse interest rates of similar banking products for households and non-financial corporations for some commonly used lending instruments.⁴ We estimate two common measures of convergence, namely β - and σ -convergence, in order to assess the speed and degree of integration. The paper is thus related to previous papers which have estimated β - and σ -convergence measures for euro area, such as Kleimeier and Sander (2005), Baele, Ferrando, Hördahl, Krylova and Monnet (2004), and Adam, Jappelli, Menichini, Padula and Pagano (2002), using slightly more precise categories of credit instruments and up-dating the results.

The rest of the paper is organised as follows. Section 2 presents the measurement of price-based integration indicators. Section 3 outlines the development of interest rates; spreads and dispersion in

¹ See *Indicators of Financial Integration in the Euro Area*, ECB 2006, and the *Financial Integration Monitor* reports, EU Commission 2004-2006.

² For a recent study, see Affinito and Farabullini (2006).

³ *White Paper on Financial Services Policy 2005-2010*, EU Commission

⁴ There are still many factors which complicate the comparisons of retail interest rates across euro countries. See the report on *Differences in MFI Interest Rates across Euro Area Countries*, ECB 2006

euro area retail banking, by country. Section 4 presents and comments on the estimation results for β - and σ -convergence and Section 5 provides some concluding remarks.

2 Measuring integration

The market for a given financial instrument can be considered fully integrated if all economic agents with the same relevant characteristics acting in the market face a single set of rules, have equal access and are treated equally.⁵ In a common currency area there is no depreciation risk and within the euro area cross-border payment transaction costs should already be negligible. Consequently for the same deposit or credit instruments the law of the one price (risk adjusted) should hold. At least price deviations should not be persistent.

Interest rate integration can be measured either by using computed or model-based indicators. Typical computed indicators include interest rates differences, interest rate spreads and margins, and standard deviations. However, if the data do not allow sorting out country effects, indicators based on econometric models might give deeper information about e.g. the rate of integration.

Widely used model-based indicators in this context are the so-called beta- and sigma-convergence measures, which are analogical to the concepts used in economic growth literature.⁶ β -convergence is an indicator of the speed at which markets are integrating. σ -convergence can be used as an indicator of how far away a retail banking market segment is from being fully integrated.

Beta-convergence can be estimated using the following equation

$$\Delta r_{ct} = \alpha_c + \beta r_{ct-1} + \sum_{j=1}^L \gamma_{cj} \Delta r_{ct-j} + \varepsilon_{ct} \quad (2.1)$$

where c and t denote the country and time indices, r the spread of the interest rates relative to some relevant benchmark rate, Δr the change in the interest rate spread, and α_c country dummies. ε is an error term.⁷

The main parameter of interest is β that denotes the speed of convergence. Under the null hypothesis of no convergence, β is equal to zero. In this case, a shock to r_{ct} is permanent.

⁵ See Adam, Jappelli, Menichini, Padula and Pagano (2002).

⁶ The β - and σ -convergence measures are well known in economic growth literature. Typical convergence studies in the growth literature regress the *average* growth rate of GDP on its initial level and interpret a negative correlation as sign of convergence. See e.g. Barro and Sala-i-Martin (1992)

⁷ The interpretation of the beta is easier to see if we assume that $\gamma=0$ and write the equation as follows:

(2.1') $r_{ct} = \alpha_c + (1+\beta) r_{ct-1} + \varepsilon'_{ct}$. If the spread r_{ct} has changed one unit in $t-1$, the change of the t -period spread is $(1+\beta)$.

Convergence implies a negative β with the approximate half-life of a shock to r_{ct} given by $-\ln(2)/\ln(1+\beta)$ ⁸. Furthermore, the negative β indicates that spreads in countries with relatively high spreads have a tendency to decrease more rapidly than in countries with relatively low spreads. And the size of β is a direct measure of the speed of convergence in the overall market. If the beta approaches -1, the convergence is complete. When running the equation (2.1) on different credit instruments we can compare the size of the betas to see how the speed of the convergence varies in different categories. The larger is the beta (absolute value), the faster is the convergence.

We test the null hypothesis of no convergence using a unit root test for panel data provided by Levin, Lin and Chu (2002).⁹ The equation (2.1) can be regarded as a standard unit root model, and if there is a unit root, there is by definition no convergence.¹⁰ Levin et al have shown that the use of a panel unit root test is particularly useful in analysing cross country data if country specific dummies are allowed.

The presence of country specific fixed effects in the estimation indicates that we are testing the relative version of the Law of One Price.¹¹ Large values of the country specific effects could be indicative of e.g. persistent market segmentation related to differences in institutional and other factors. We can calculate long term differences in spreads by dividing α_c by $-\beta$ ¹². Additionally, Δr_{ct-j} capture possible serial correlation in the error term.

As the β -convergence does not provide any information to what extent markets are already integrated, it is possible to investigate the evolution of the cross-sectional dispersion by σ -convergence. The degree of financial integration increases when the cross-sectional standard deviation of interest rates is trending downward. If the cross-sectional distribution collapses to a single point and the standard deviation converges to zero, full integration is achieved.

The speed at which the cross-sectional dispersion decreases can be calculated from a regression of the cross-sectional dispersion on a time trend:

$$S_{it} = a_i + b \cdot t + \varepsilon_{it} \quad (2.2)$$

⁸ This formula is only exact for simple AR (1) process. See Goldberg and Verboven, 2005

⁹ LLC assumes a homogeneous rate of convergence across the series, but there are other possibilities to test the unit root hypothesis in panel data, like Im, Pesaran, and Shin (2003), where individual unit root processes are allowed for each cross section. A good survey of existing unit root tests, see Lopez (2006).

¹⁰ The idea of the unit root testing in panel data has been applied also in other areas such as in exchange rates and Eurocurrency interest rates, where convergence, purchasing power parity or mean reversion has been investigated. See e.g. Frankel and Rose (1995), Wu and Chen (2001), Lopez and Papell (2004).

¹¹ For a detailed description of the effects of fixed country dummies in an integration study, see Goldberg and Verboven (2005).

¹² In the long run we have $r_t^* = \alpha_c + (1+\beta) r_t^* \rightarrow r_t^* = \alpha_c / -\beta$.

where S is the standard deviation of the credit instrument i across countries and t is the time trend variable.

Adam *et al* also stress the importance that the two convergence indicators have different informational contents: β -convergence does not imply σ -convergence, which makes these two measures complementary. The reason is that mean reversion ($-1 \leq \beta < 0$) does not imply that the cross sectional variance decreases over time.¹³

3 Data

The new harmonised MIR data used here covers the period 2003/1 – 2006/5. The following six categories of credit interest rates are studied:

Loans to households (new business):

1. Housing loans at a floating rate or up to one-year initial rate fixation
2. Housing loans with an initial rate fixation of more than five year and up to ten years
3. Loans for consumption purposes at a floating rate or up to one-year initial rate fixation
4. Loans for consumption purposes with an initial rate fixation of over one and up to five years

Loans to non-financial corporations (new business):

5. Loans up to EUR 1 million at a floating rate or up to one-year initial rate fixation
6. Loans over EUR 1 million at a floating rate or up to one-year initial rate fixation

When comparing interest rates over products and countries, it is important to identify products with same risk profile (i.e. interest rate fixation, maturities, collaterals etc). That is why we have used rather detailed categories of credit instruments, paying particular attention to interest rate fixation.

The developments of the interest rate levels by country are shown in charts 1a to 4a.¹⁴ The categories are chosen according to their importance at the euro area level i.e. categories which are the most relevant in new lending on the average in euro area.¹⁵ As seen from the charts differences in

¹³ In fact, β -convergence could even be associated with σ -divergence

¹⁴ The interest rates by country are published in a co-ordinated way on the web-sites of the ECB and NCBs since October 2006. We present here only four categories by country because housing loans with an initial rate fixation of more than five year and up to ten years and loans for consumption purposes at a floating rate or up to one-year initial rate fixation are not published by country. The estimations have been done for all the six categories.

¹⁵ Bank overdrafts were excluded because of the discursion of the category

levels between the interest rates among the countries are relatively permanent. In this paper we are not explaining the differences in the levels. To be able to explain these differences we would need to construct supply and demand models for bank loans. The fact that there are significant differences between the interest rates among the euro countries supports the observation that retail banking markets are still segmented due to various legal and institutional reasons. Also natural barriers to entry such as language and geographical distance and strategic barriers such as branch network tend to keep markets segmented despite of the common currency and market opening EU policies.¹⁶

To estimate the β -convergence our main interest is concentrated on the development of interest rate spreads instead of the levels. The use of spreads cancels the effects of global macro variables such as changes in inflation which can be assumed to influence roughly in a similar way to all retail interest rates during a limited period under investigation.

There are different ways to calculate the spreads. One approach is to define spreads in relation to the average of the euro area interest rates in different product categories. The drawback of this choice is that the spreads defined this way do not focus on existing bilateral spreads in this context where the process of integration and possibilities to arbitrage are in the centre of attention. Another common way of defining spreads is to select a representative financial market rate as a benchmark. In that case the discussion of the most appropriate refunding rates by categories and countries would become into the focus.¹⁷ The third possibility is to use the lowest country's interest rate level in each category as a benchmark. The assumption is accordingly that the lowest interest rate level reflects "the best performing" interest rate level towards which the integration process and increased competition is forcing the interest rate of the same product in other countries. We have chosen here this third option to analyse the convergence of interest rates. To get an idea how much the choice of the benchmark matters we estimated also the equations using representative financial market interest rates as a benchmark. The choice of the benchmark influences clearly to the size of the beta-coefficient and its interpretation.¹⁸

The development of spreads calculated relative to the lowest country for different credit products by countries are shown in charts 1b to 4b. The spreads were calculated taking on the average lowest country's rate in each category as a benchmark. This approach – using the same country during the whole period - would not have been possible if the lowest country would have changed frequently

¹⁶ A thorough analysis of the current integration of European Banking is to be found in CEPR's and BBVA's report *Integration of European Banking*, 2005.

¹⁷ In the ECB report of MFI interest rates differentials is shown, how the MFI interest rates correlate with different financial market rates by instrument categories. See p. 39.

¹⁸ See table 1 for the results.

during the period. But as seen from the charts, in each category the lowest country kept its position also in absolute terms with only few exceptions. The smallest spreads are observed in large loans (over EUR 1 million) for non-financial corporations, with initial rate fixation up to one year, and in loans to households for house purchase (initial rate fixation up to one year). The spreads are significantly larger in consumer credits and in small loans for non-financial corporations.

Finally, chart 5 shows unweighted cross country dispersions of the interest rates by categories. The lowest variations are observed for the same categories as the lowest spreads i.e. large loans for non-financial corporation and loans for house purchase. Interest rates for consumer credits have a high dispersion. The behaviour of these dispersions confirms the common observation that in those categories where there is a homogeneous and highly competed product, there is a tendency in interest rates to behave rather similar way from country to country.

4 Estimation results

In the econometric analysis we use for each credit product a panel that consists of 462 country-month [11*42]¹⁹ observations. The panel regression has been run for all six credit interest rates spreads described above.

The main estimation results are shown in table 1. The β -coefficients are in all categories negative varying between - 0.132 and - 0.506 (base: lowest country). The speed of the integration has been fastest in interest rates for the large loans to non-financial corporations and lowest in loans for small non-financial corporations. The approximate half- lives calculated from the model $(-\ln(2)/\ln(1+\beta))$ are from one month to five months. This means that a shock of one unit in the interest rate for big loans to non-financial corporations takes one month to halve, while for small company loans it takes 5 months.

The Lin, Levin and Chu unit root tests show that the hypothesis of the unit root ($\beta=0$) can be rejected in all cases except the category of the consumer loans with interest rates fixation variable or up to one year. Thus according to the results the interest rate spreads against the lowest country in all other categories have shown convergence during 2003-2006.

¹⁹ There are some exceptions, see the footnotes in table 1.

Table 1. Beta -and σ -convergence 2003 – 2006

<i>Credit instrument</i>	<i>Beta-convergence (eq 2.1). Base: lowest country</i>	<i>Beta-convergence (eq 2.1). Base: market rates</i>	<i>σ-convergence (eq 2.2)</i>
Non-financial corporations			
<i>New big loans (over EUR 1 million)</i>	<i>- 0.506</i>	<i>- 0.305</i>	<i>- 0.0009 *</i>
<i>Interest rates fixation variable or up to one year</i>	<i>-5.38***</i>	<i>- 2.68***</i>	<i>(0.00059)</i>
<i>New small loans (up to EUR 1 million)</i>	<i>- 0.132</i>	<i>- 0.061</i>	<i>- 0.0022***</i>
<i>Interest rates fixation variable or up to one year</i>	<i>- 2.30***</i>	<i>0.82</i>	<i>(0.00055)</i>
Households			
<i>New loans for house purchase</i>	<i>-0.240</i>	<i>- 0.042</i>	<i>- 0.0037***</i>
<i>Interest rates fixation variable or up to one year</i>	<i>- 1.33*</i>	<i>0.33</i>	<i>(0.00037)</i>
<i>New loans for house purchase</i>	<i>- 0.234²⁰</i>	<i>-0. 234²⁰</i>	<i>-0.0013²¹</i>
<i>Interest rates fixation over 5 up to 10 years</i>	<i>- 2.25***</i>	<i>1.75**</i>	<i>(0.00130)</i>
<i>New consumer loans</i>	<i>- 0.162²²</i>	<i>- 0.043²²</i>	<i>- 0.0054***</i>
<i>Interest rates fixation variable or up to one year</i>	<i>- 0.157</i>	<i>1.10</i>	<i>(0.00129)</i>
<i>New consumer loans</i>	<i>- 0.339</i>	<i>- 0.139</i>	<i>- 0.0008</i>
<i>Interest rates fixation over 1 up to 5 years</i>	<i>- 5.13***</i>	<i>-1.25*</i>	<i>(0.00116)</i>

Note: The dependent variable in equation (2.1) is the change of the spread of the credit instrument. The specification includes a set of country dummies, one lag of the level of the spread, and one lag of the dependent variable. The number of lags was determined by including longer lags and testing their statistical significance. It turned out that one lag was enough and the longer lags did not contribute to the estimation results. The estimates of the betas are derived using the Levin, Lin and Chu method for testing the panel unit root, and the relevant test statistics $N(0, 1)$ are shown in italics under the coefficient. If the H_0 (there is a unit root) can be rejected by 1 %-level, it is marked with ***, by 5 %-level with **, and by 10 %-level with *.

In equation (2.2) the dependent variable is the unweighted standard deviation of the credit instrument across countries. The specification includes a constant and a time trend. It is estimated by OLS; the trend coefficients and their standard errors (in parenthesis) are reported.

²⁰ Excluding Luxemburg and Portugal

²¹ Excluding Spain

²² Excluding Luxemburg

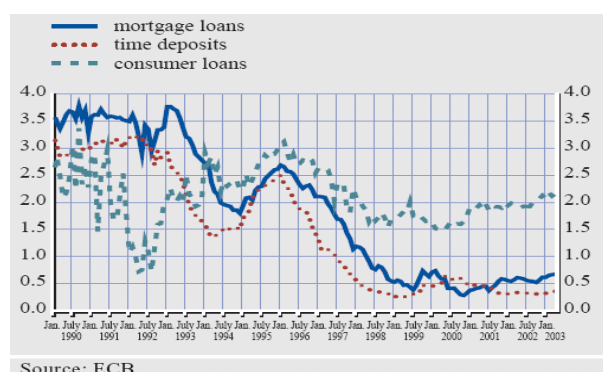
The fastest convergence estimated for big loans to non-financial corporations supports the view that companies taking large loans might have negotiation power as they have the possibility to request loan offers from different banks and even from foreign banks. The conditions of loans offered by banks could thus be expected to turn rather similar.

On the other hand, the absolute values of the estimated β -coefficient for new loans to house purchase are rather low e.g. compared to the narrow spreads observed in Chart 3. As shown by Baele et al. the standard deviation of interest rates on housing loans decreased dramatically already during the nineties.²³ Since 2003, the keen competition in housing loans typical in euro area is reflected by decreasing spreads in all countries but the shocks to interest rates might be eliminated more slowly in already integrated markets. Therefore one of the explanations for a low convergence might be that since the absolute interest rate differences have already declined, the speed of convergence gets lower. The observation is in line with the commonly observed non-linearities in the speed of convergence: large shocks and large differences tend to be eliminated faster than the small differences.²⁴

Accordingly, the β -convergence does not provide any information to what extent markets are already integrated if it has not occurred during the period investigated. The results with respect to consumer loans for households show that consumer loans with a longer fixation of interest rates have converged rather quickly even if there are still quite a significant differences in the levels of interest rates. This result is again in line with observation that large differences tend to be eliminated faster than small differences.

To evaluate the robustness of the estimations they were repeated using as a benchmark corresponding financial market rates for each loan category. The results show that the beta-coefficients

²³Standard deviation of interest rates on consumer and mortgage loans and time deposits 1990-2003



²⁴ See Goldberg and Verboven (2005)

do differ in some cases significantly from those of the lowest country. The results are also less supporting the convergence; in three cases the unit root can not be rejected. As discussed earlier, choosing market interest rates as the benchmark might also have some drawbacks which are not included if the base is the lowest country. A problematic issue is the interpretation of the beta, since the convergence is now conditional in addition to the fixed country effects also to the banking margin, which has not been constant during the period investigated.

The coefficients for σ -convergence are all negative and in four categories statistically significant indicating increased degree of integration.²⁵ The fastest decrease of dispersion has occurred in consumer credits with a short term interest rate fixation. Also small loans to non-financial corporations show decrease of dispersion. These results are intuitively reasonable because the dispersions in these categories are large.

The country specific dummies are jointly significant at the 1% level. Therefore imposing a common constant across the countries does not appear to be justified. The fixed effects capture the differences in levels of interest rates which still remain. Even if banking markets might be considered quite advanced from a legal perspective, there still are other types of barriers to integration in place as mentioned earlier.

The long term interest rates differences ($\alpha_c / -\beta$) calculated by the model are shown in table 2. They are on the average the smallest in housing loans with a short initial interest rate fixation and the largest in consumer credits with interest rate fixation from 1 to 5 years.

²⁵ The σ -convergence equation has been estimated for the category of new loans for house purchase with interest rates fixation over 5 up to 10 years excluding the data from Spain. Spanish interest rates are clearly outliers, because new loan agreements in this category are negligible.

Table 2. Long term interest rate differences 2003-2006, basis points

<i>Country</i>	<i>Big loans to NFCs</i>	<i>Small loans to NFCs</i>	<i>Housing loans up to 1 y</i>	<i>Housing loans 5 to 10 y</i>	<i>Consumer credits up to 1 y</i>	<i>Consumer credits 1 to 5 y</i>
<i>Austria</i>	11	-1	94	99	82	<i>Base</i>
<i>Belgium</i>	0	25	25	42	198	292
<i>Germany</i>	44	97	132	84	85	161
<i>Spain</i>	7	21	14	273	369	301
<i>Finland</i>	20	5	<i>Base</i>	<i>Base</i>	<i>Base</i>	49
<i>France</i>	<i>Base</i>	<i>Base</i>	41	32	74	203
<i>Greece</i>	86	161	101	210	440	536
<i>Ireland</i>	132	88	25	94	99	..
<i>Italy</i>	20	48	44	84	632	412
<i>Luxemburg</i>	37	31	35	108
<i>Nederland</i>	8	-5	23	66	325	..
<i>Portugal</i>	84	219	31	..	341	573

5 Conclusions

There are clear differences in the levels of retail lending interest rates for various loan instruments across the euro countries. In spite of the differences in levels it is, however, possible that the integration process is under way. We have tested this phenomenon using two common integration indicators based on econometric models, the so called beta- and sigma convergence.

We find in addition to these persistent "long-term" differences in the retail lending interest rates some evidence for convergence in the interest rates. The speed of convergence varies in the different categories of the products.

During the period analysed (2003-2006) the spreads of the large loans to non-financial corporations show the fastest speed of convergence. We can expect that integration pushes the spreads closer to each other because of the increased competition in a primarily unrestricted environment. Even if there is not so much cross border businesses in retail banking, the threat of the entry to the markets is one of the relevant factors influencing the behaviour of the banks. The conditions under which loans are offered could therefore be expected to become rather similar in the course of time. Also the standard deviation of the interest rates across the countries is the smallest in this category.

Housing loans are integrated in the euro area, particularly those loans with variable or short term interest rate fixation. The standard deviation of the interest rates on housing loans across the countries has been fluctuating between 40 and 50 basis points which corresponds to the figures for large loans to firms. However, the estimated beta-convergence is clearly lower than the corresponding beta for large loans to enterprises, which can be understood because the convergence had mainly occurred already before the period included in this study.

The results with respect to consumer credits for households show that loans with a longer fixation of interest rates have converged rather quickly even if there remain quite significant differences in the levels of interest rates. This result is in line with the observation that large differences tend to be eliminated faster than small differences. Also the dispersion of the consumer credit interest rates is still high but there is a negative, statistically significant trend in the dispersion. There are nevertheless many difficulties when comparing interest rates for consumer credits by country because the classifications, collaterals and pricing behaviour of the banks might differ significantly across the euro area.

The results of convergence in euro area retail interest rates provided in this paper compared to the previous results show many similarities measuring the convergence, but there are also some interesting

differences.²⁶ These results here are, however, still very preliminary, and thus allow only for cautious conclusions.

First, the availability of the harmonised statistics on interest rates on MFI loans gives us a possibility to assess the convergence of these interest rates at a more detailed level than before. Even if there are still difficulties with the data, the analysis of convergence should now be on a sounder basis than before. With the new statistics we can analyse separately e.g. the interest rates for large and small loans to non-financial corporations with short term and longer term original interest rate fixation while earlier the interest rates for enterprises were split only into short term and long term loans, a classification that did not tell as much about how the interest rates are determined

Second, the use of panel data estimation is advantageous compared to single country estimations because the length of time series is still rather short in the new statistics. To integrate the old and new statistics to get longer time series is also possible but it requires a lot of extra work²⁷ and the level of disaggregation is lost nevertheless because there is not any extensive data available before 2003 by country following the new detailed classification. The common problems of testing the panel estimation when country specific fixed effects are allowed are possible to bypass using the unit root tests developed for panel data. According to the results it seems that estimated convergence is also statistically significant in most of the cases.

On the other hand, the results of the estimations here show similar progress of the convergence in retail interest rate markets as found in recent studies testing the purchasing power parity of exchange rates,²⁸ the law of one price of commodity markets²⁹, or the mean reversion of Eurocurrency interest rates³⁰. In the previous research on these fields the results used to be rather negative in relation to the hypotheses, and the unit root hypothesis (there is a unit root) could not be rejected. In the light of the new research in these areas there are now more favourable empirical evidences found for these fundamentals.

²⁶E.g. Baele, Ferrando, Hördahl Krylova and Monnet (2004), and Adam, Jappelli, Menichini, Padula and Pagano (2002).

²⁷ There is a long time project at the ECB on this subject going on.

²⁸ E.g. Frankel and Rose (1996), Lopez (2006)

²⁹ Goldberg and Verboven (2005)

³⁰ Wu and Chen (2001)

References

Adam K., T. Jappelli, A. Menichini, M. Padula and M. Pagano (2002), *Analyse, Compare and Apply Alternative Indicators and Monitoring Methodologies to Measure the Evolution of Capital Market Integration in the European Union*, Centre for Studies in Economics and Finance, Department of Economics and Statistics, University of Salerno, January 2002.

Affinito M. and F. Farabullini (2006), *An empirical analysis of national differences in retail bank interest rates of the euro area*, Banca d'Italia, Termini di discussione, Number 589, May 2006.

Baele L., A. Ferrando, P. Hördahl, E. Krylova and C. Monnet (2004), *Measuring Financial Integration in the Euro Area*, ECB Occasional Papers Series, 14.

Barro R. and X. Sala-i-Martin (1992), *Convergence*, The Journal of Political Economy, Vol. 100, No. 2, p. 223-251.

European Central Bank (2006), *Differences in MFI Interest Rates across Euro Area Countries*, September 2006.

European Central Bank (2006), *Indicators of Financial Integration in the Euro Area*, September 2006.

European Commission (2005), *Financial Integration Monitor*, July 2005.

European Commission (2005), *White Paper on Financial Services Policy 2005-2010*.

Frankel J. and A. Rose (1995), *A Panel Project on Purchasing Power Parity: Mean Reversion within and between Countries*, NBER Working Paper, No. 5006.

Goldberg and Verboven (2005), *Market Integration and Convergence to the Law of One Price: Evidence from the European Car Market*, Journal of International Economics 65, 2005

Im K.S., M.H. Pesaran and Y. Shin (2003), *Testing for Unit Roots in Heterogeneous Panels*, Journal of Econometrics, 115, p. 53-74.

Integration of European Banking: The Way Forward, Monitoring European Deregulation 3 (2005), Centre for Economic and Policy Research and Fundación BBVA.

Kleimeier S. and H. Sander (2005), *Regional versus Global Integration of Euro-Zone Retail Banking Markets: Understanding the Recent Evidence from Price-Based Integration Measures*, Maastricht University and University of Applied Science Cologne, Working Paper, August 2005.

Levin A, C-F Lin and C-S J Chu (2002), *Unit Root Tests in Panel Data: Asymptotic and Finite-Sample Properties*, Journal of Econometrics, 108, p.1-24.

Lopez C. and D. Papell (2004), *Convergence to Purchasing Power Parity at the Commencement of the Euro*, Review of International Economics, forthcoming.

Lopez C (2006), *A Panel Unit Root Test with Good Size and Power in Small Samples*, Working Paper, University of Cincinnati, July 2006.

Wu J-L and S-L Chen (2001), *Mean Reversion of Interest Rates in the Eurocurrency Market*, Oxford Bulletin of Economics and Statistics, 63, p. 459-473.

Chart 1a. Interest rates on new loans to non financial corporations (over EUR 1 million)

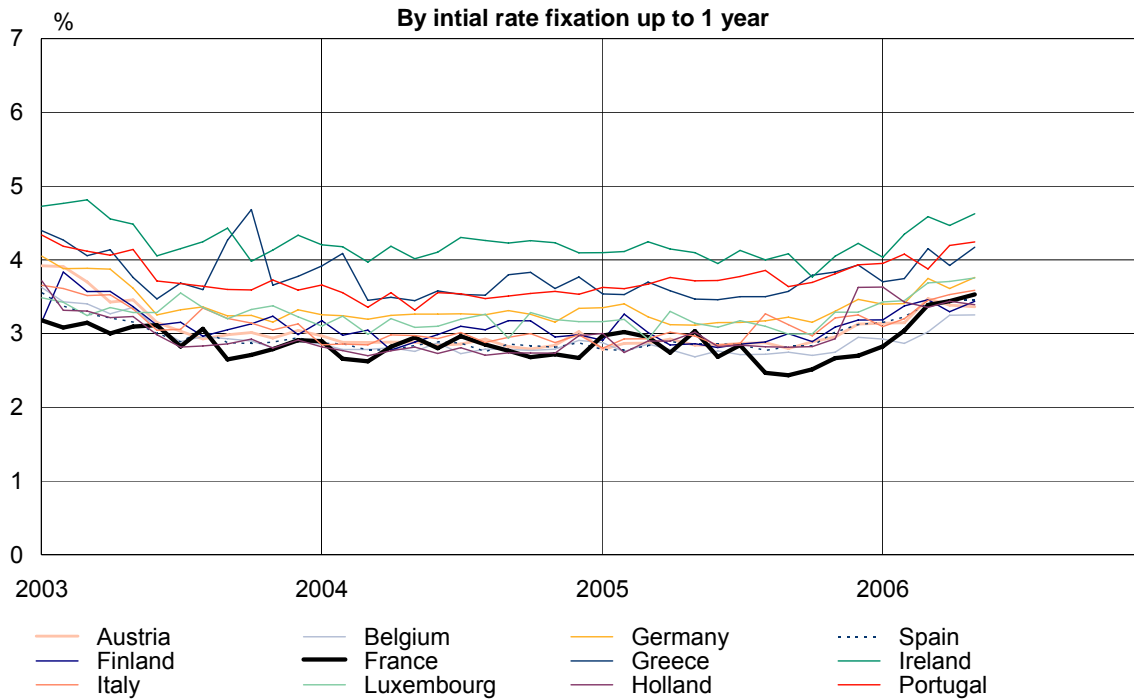


Chart 1b. Interest rate spreads on new loans to non financial corporations (over EUR 1 million)

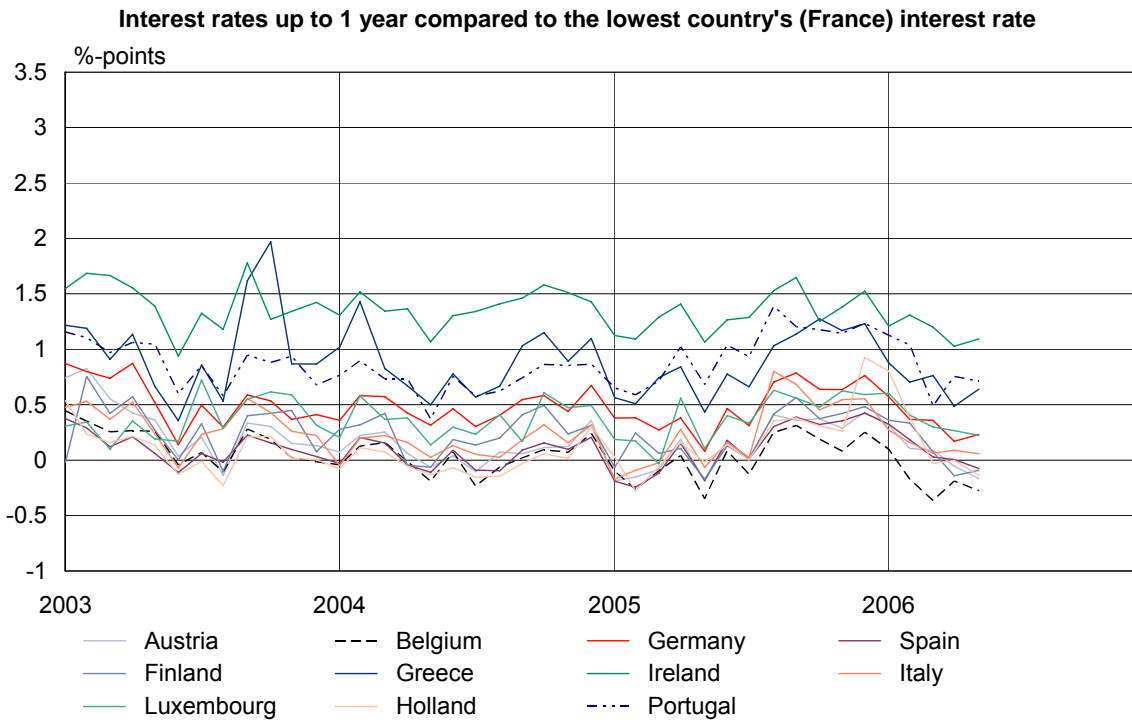


Chart 2a. Interest rates on new loans to non financial corporations (max EUR 1 million)

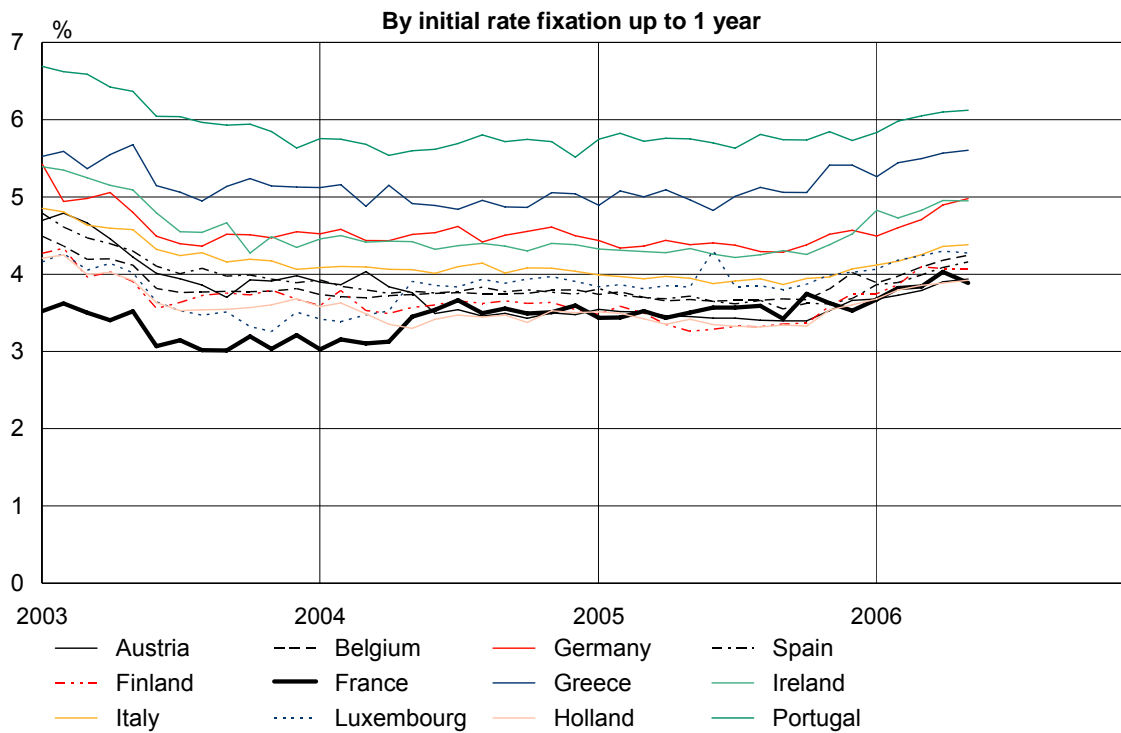


Chart 2b. Interest rate spreads on new loans to non financial corporations (max EUR 1 million)

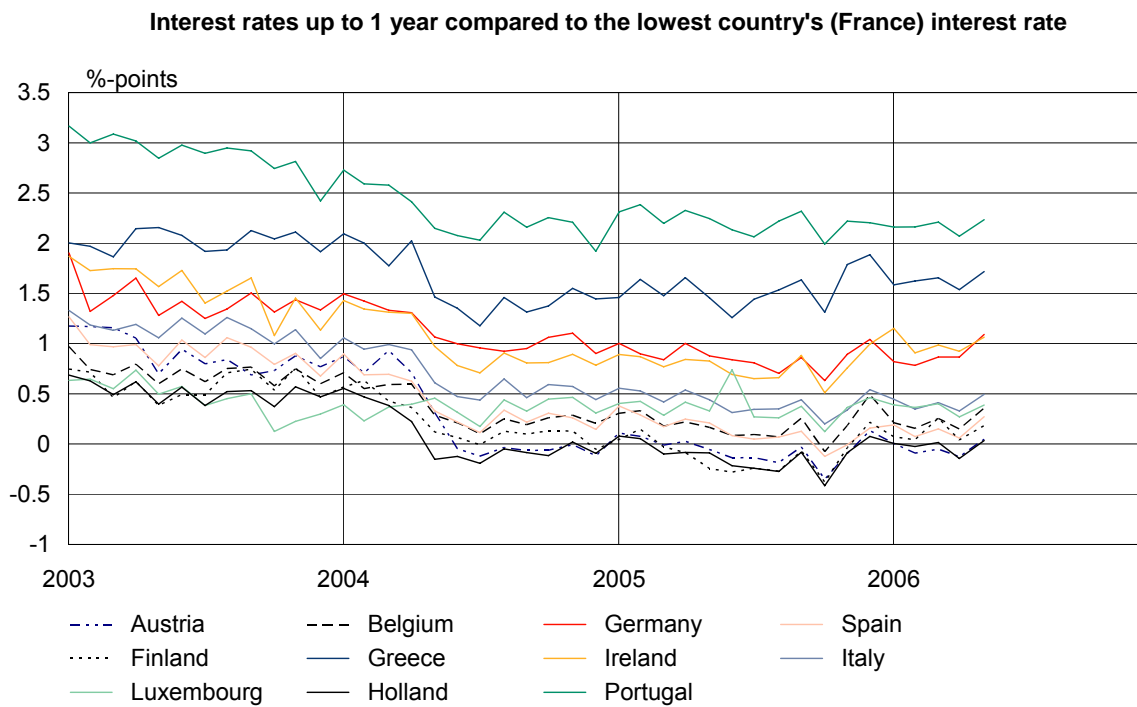


Chart 3a. Interest rates on new loans for house purchase

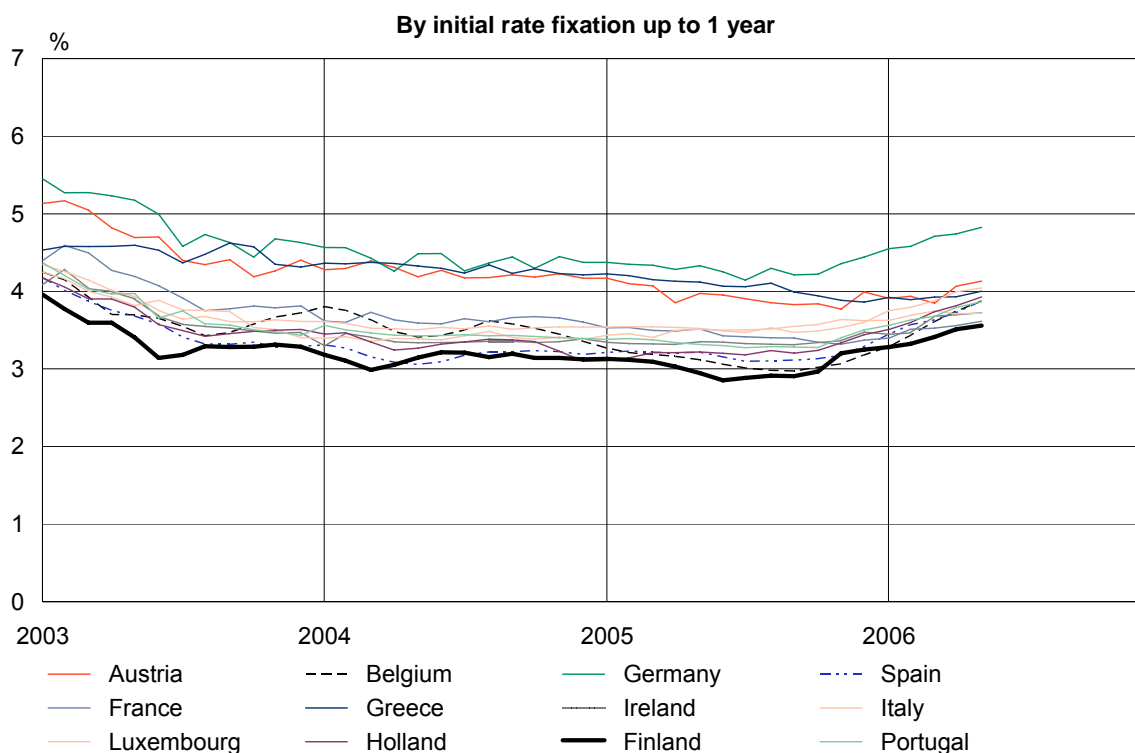


Chart 3b. Interest rate spreads on new loans for house purchase

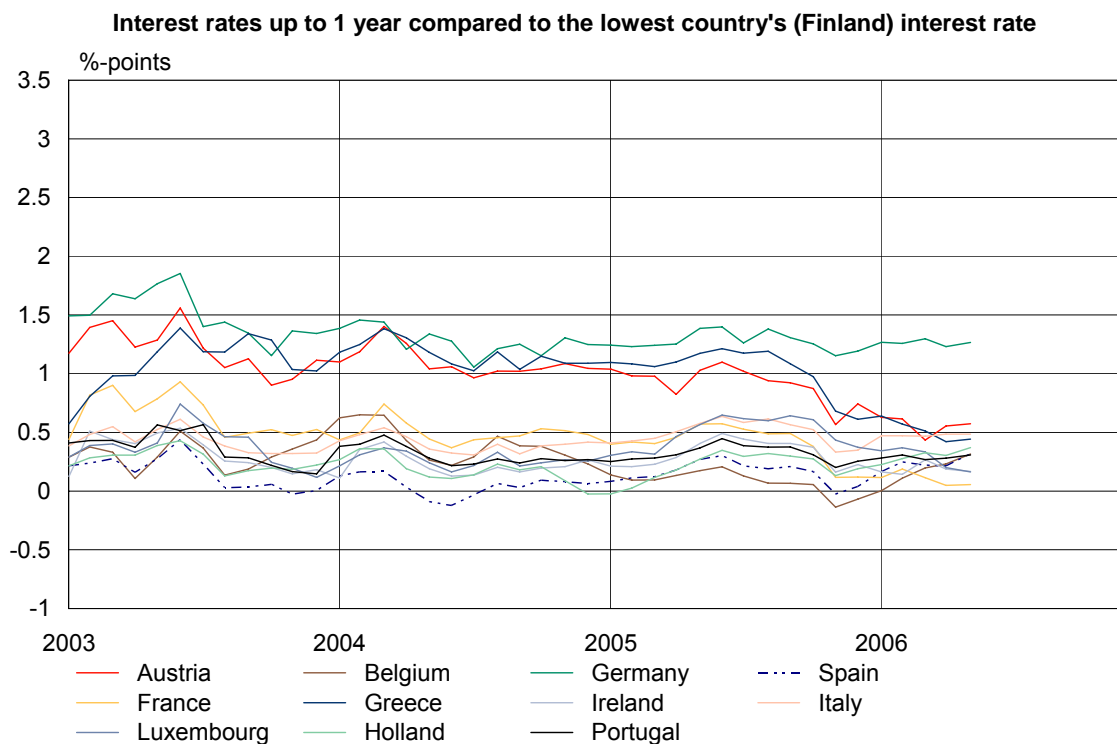


Chart 4a. Interest rates on new consumer credit

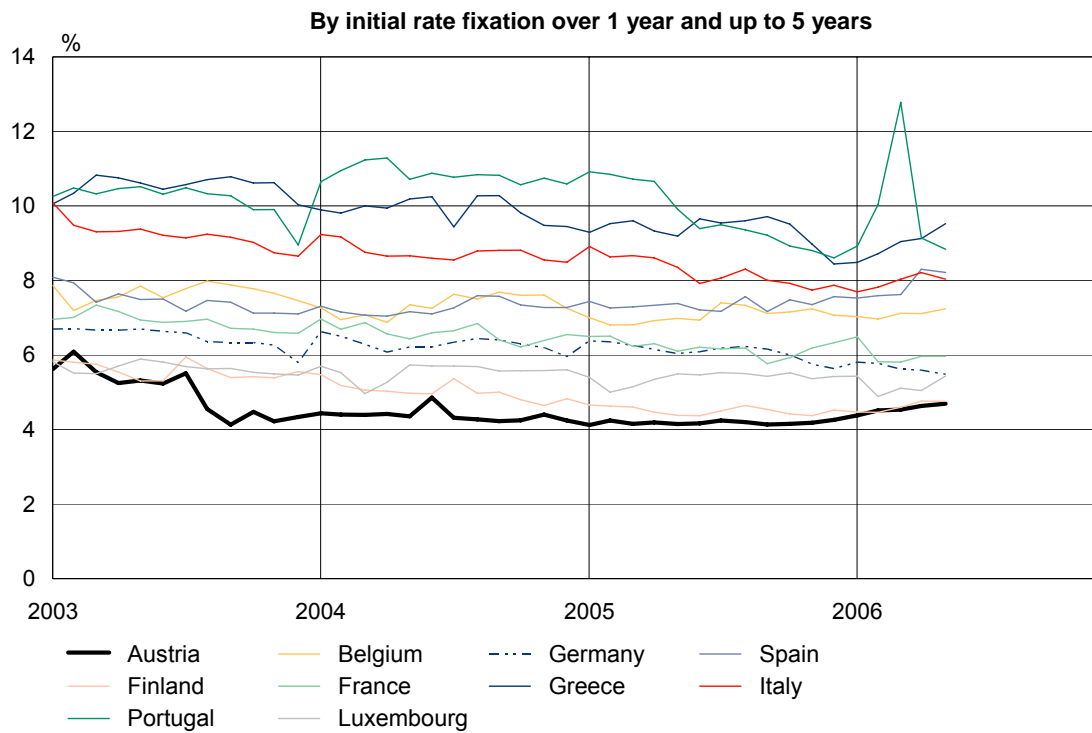


Chart 4b. Interest rate spreads on new consumer credit

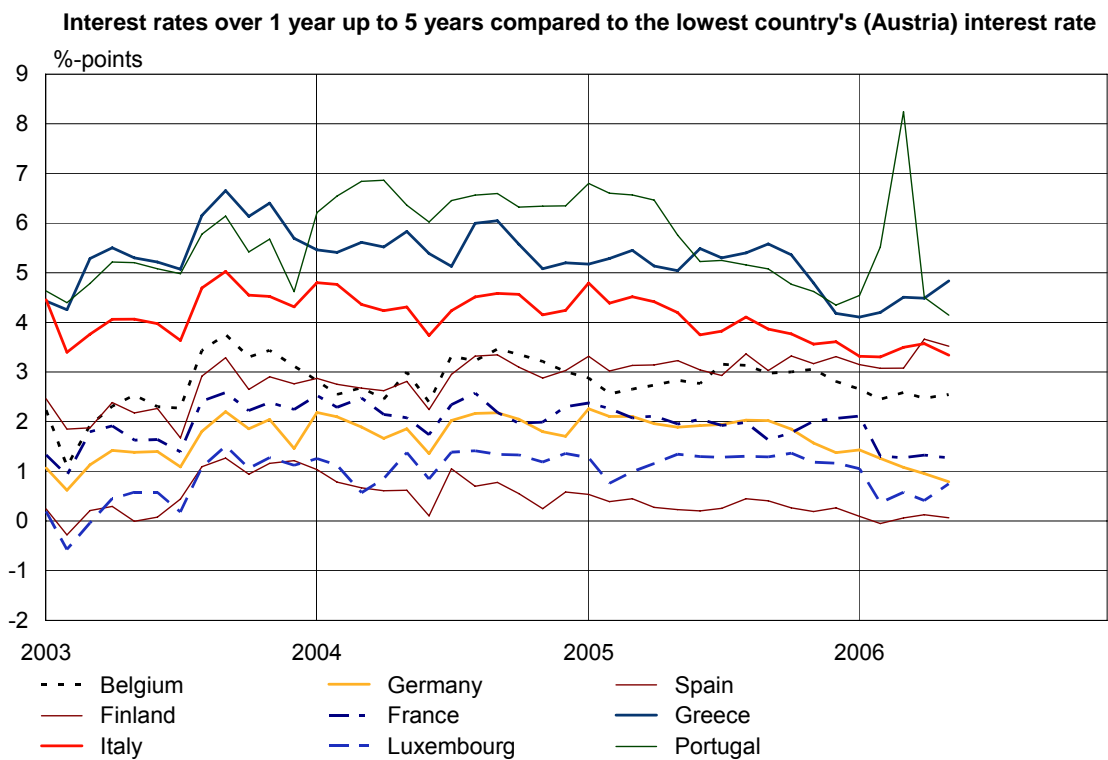


Chart 5. Unweighted standard deviation of interest rates

