BANCA D'ITALIA

Temi di discussione

del Servizio Studi

An empirical analysis of national differences in the retail bank interest rates of the euro area

by M. Affinito and F. Farabullini

Number 589 - May 2006

The purpose of the Temi di discussione *series is to promote the circulation of working papers prepared within the Bank of Italy or presented in Bank seminars by outside economists with the aim of stimulating comments and suggestions.*

The views expressed in the articles are those of the authors and do not involve the responsibility of the Bank.

AN EMPIRICAL ANALYSIS OF NATIONAL DIFFERENCES IN THE RETAIL BANK INTEREST RATES OF THE EURO AREA

by Massimiliano Affinito* and Fabio Farabullini*

Abstract

The availability of new harmonized data on bank interest rates allows a rigorous assessment to be made of cross-country price homogeneity/heterogeneity in euro area retail credit markets. Econometric analysis shows that the banking market is still highly segmented and that the degree of integration in a single country (Italy, taken as a benchmark for integration) is greater than in the euro area. However, national differences can be partially explained by variables reflecting the characteristics of domestic depositors and borrowers ("demand side" regressors, such as risk exposure, disposable income, alternative financing sources, average firm size) and the characteristics of the banking systems ("supply side" regressors, such as banking market concentration, asset and liability structure). The euro area prices appear different because national banking products appear different or because they are differentiated by national factors. Once these factors have been controlled for, many differences disappear.

JEL classification: E43, E44, G21.

Keywords: bank interest rates, convergence, integration.

* Bank of Italy, Economic Research Department.

Contents

1. Introduction[1]

A large stream of literature exists on the integration of national credit markets in the euro area. The European process of integration is expected to entail more homogeneous banking systems through the harmonization of financial regulation, the single monetary policy and the single currency.[2]

The literature has measured financial integration of the euro area for several sectors and products that make up a financial system, using various quantity and price indicators.[3] In this paper, we exploit new harmonized data on bank interest rates, which permit a consistent cross-border comparison, to verify cross-country price homogeneity/heterogeneity in the euro area retail credit markets. Indeed price level homogeneity across countries is often used as an indicator of the degree of market integration in an economic area.[4]

We divide our analysis into three steps. In the first step, we make an unconditional test of the cross-country equality of interest rates, using two different econometric methods. In the other steps, we continue to use only one of two methods allowing for the effect of the main determinants of bank interest rates. If rates are different, but the difference is due to economic factors, it should disappear once we control for these factors. In our estimations we include the main determinants of bank interest rates, both "demand side" characteristics (second step) and "supply side" characteristics (third step). The issues in the extensive literature on bank interest rates are a second field of economic research related to this work.

---

[1] We wish to express our particular thanks to Giacomo Cau, who has collaborated with us on an earlier paper entitled "Banking interest rates: a comparison between Italy and euro area". We would like to thank Riccardo De Bonis, Donald Hester, Miria Rocchelli, Luigi Federico Signorini and two anonymous referees for help, comments and feedback, and all the participants at the meeting held by the Statistics Committee of the ESCB at Toulouse and at the seminars held at the Economic Research Department of the Bank of Italy. The usual disclaimer applies. The opinions expressed are those of the authors only and in no way involve the responsibility of the Bank.

[2] Some references are: Cecchini (1988); European Central Bank (1999a, 1999b, 2002); Padoa-Schioppa (2000); Danthine, Giavazzi and Von Thadden (2000); De Bandt (2000); Dermine (2000); Belaisch *et al.* (2001); Adam *et al.* (2002); Dermine (2003); Trichet (2006).

[3] Adam *et al.* (2002); Affinito, De Bonis and Farabullini (2004); Calcagnini, Farabullini and Hester (2004); Bartiloro and De Bonis (2004); Manna (2004); Baele *et al*. (2004).

[4] On the other hand, identical prices across countries do not automatically entail an integrated market because they could accidentally appear even if market conditions were not competitive or if non-competitive conditions were similar across countries. However, in the paper our aim will be just to control for market conditions.

The plan of the paper is as follows. The next section presents the new euro area harmonized data on bank interest rates and some evidence on cross-country dispersion. The third section reports two econometric exercises measuring cross-country similarities; the Italian case is analyzed as benchmark of integration, comparing the euro area inter-country variation with the intra-country variation of Italian regions. The fourth section provides regressions carried out using national determinants of differences in bank interest rates. The fifth section repeats the exercise on the homogeneity of euro area bank rates on "cleaned up" data, i.e. after controlling for the national factors influencing the level of interest rates. The final section summarizes our findings.

2. The data and a descriptive analysis of the cross-country dispersion of bank interest rates

This paper uses new harmonized monthly data on euro area banking interest rates, collected by the Eurosystem since January 2003. The statistics include 45 product-specific rates on euro deposits and loans to households and non-financial corporations, on outstanding amounts and new business. The twelve euro area National Central Banks (NCBs) use a common definition of the rates and follow the same methodological criteria in designing the sample of reporting agents (banks) and computing aggregates.[5]

The new data permit consistent cross-border comparisons, both on deposit and lending rates. For the purposes of this paper, we have selected 5 deposit interest rates, 5 lending interest rates to households, and 4 lending interest rates to non-financial corporations; Table 1 reports some descriptive statistics on the 14 interest rates. All interest rates refer to new business for the period January 2003 - March 2005. New business rates do not suffer from the national pre-euro effects that could influence outstanding amounts. We have excluded

[5] The new harmonized data are called "MIR", or MFI interest rates. MFIs (Monetary Financial Institutions), which form the money-issuing sector of the euro area, are the institutions subject to the statistical reporting requirements of the ECB. This information is collected and compiled by the Eurosystem primarily as a support for monetary policy; thus the data cover the main categories of bank deposits included in M3, and loans in the counterparts of M3. However, the harmonization of collection and compilation criteria makes the new data more generally suitable for economic analysis, both at national and at euro area level. Further details are in the Appendix. For methodological aspects, see Regulation N. 63/2002 (ECB/2001/18); ECB (2003); Battipaglia and Bolognesi (2003); Banca d'Italia (2003) - *Supplements to the Statistical Bulletin, Monetary Financial Institutions: Banks and Money Market Funds*, www.bancaditalia.it/publications/statistics.

rates on deposits of non-financial corporations because of the low relevance of this category in several countries. We have chosen to focus on weighted aggregated interest rates, overlooking the breakdowns by maturity or initial period of rate fixation, because the aim of this paper is to test price homogeneity in the euro area: while differences may exist for individual maturity and fixation period, this is not necessarily the case for the overall average interest rate.

The descriptive statistics provide some preliminary stylized facts on cross-country dispersion. Regarding deposit rates, the cross-country coefficient of variation is higher for current accounts and deposits redeemable at notice, while it is lower for deposits with agreed maturity and for repos (Figure 1). The dispersion of interest rates on loans to households is lower than on deposits (Figure 2): loans for house purchases display minimum dispersion. Interest rates on loans to non-financial corporations show a comparatively low degree of dispersion, except for overdrafts (Figure 3). The dispersion is slightly higher, however, for small loans (up to €1 million) than for large loans (over €1 million).

Several aspects can explain the differences across countries. The dispersion of interest rates is partially due to persistent national practices. For example, the fees applied in some countries to overnight deposits affect the larger dispersion.[6] Further differences are due to the composition of national balance sheets (Table 2). For example, in several countries, deposits redeemable at notice are widespread, with increasing interest rates on larger deposits, and are used even for settling other financial products such as mortgages; by contrast, in other countries (such as Italy) they are less important and usually offer a low return. In a similar way, the very different share of overdrafts in the banking business of the 12 countries adds to the dispersion; this probably also explains why the "total loans" indicator has a higher dispersion than each component.[7]

[6] In some countries, for example even for fiscal reasons, banks might prefer to apply lower fees and lower interest rates, but might behave the opposite way in other countries. In other countries again (mainly France) current accounts cannot bear interest.

[7] In some countries (Spain) bank overdrafts represent a residual type of financing with very high interest rates (Banco de España, 2004); in other countries (Italy) bank overdrafts are more usual and have a cost closer to other types of loans.

The characteristics of bank customers, mainly the risk profile of borrowers, are another factor influencing differences. For example, overdraft relationships imply a larger variance of the level of risk of the customer and this means a larger variance of interest rates applied to the borrowers.

The different adjustments to monetary policy inputs play a role in explaining the dispersion among countries as well. Table 3 reports the changes of interest rates in the time frame considered.[8] Interest rates on overnight deposits and overdrafts display a low elasticity to policy rates, while interest rates on loans for house purchases undergo larger changes, despite their low absolute value.

The next sections will investigate these preliminary suggestions further by analyzing first the existing homogeneity/heterogeneity in euro area bank interest rates and second the main determinants.

3. Are euro area bank interest rates homogeneous?

Interest rates can be studied by looking at developments over time, at their levels or at the spreads between rates. Since harmonized euro area banking interest rate series are still short, the study of changes in interest rates appears less interesting. Specifically, if we wanted to estimate euro area rate convergence, we would need longer time series, at least spanning the 1999 changeover, in order to see whether it marked a break in geographical market segmentation.[9]

Although it is not yet possible to analyze long-run convergence, the new harmonized data make it possible to assess, in a static sense, the current degree of similarity between

[8] In the time period analyzed, bank interest rates have been affected by the decrease in the policy rates set by the ECB. Between January 2003 and March 2005, the interest rate on the main refinancing operations was reduced by 75 basis points in all. The (minimum) interest rate on main refinancing operations was lowered from 2.75 to 2.50 per cent as of 7 March 2003 and to 2 per cent as of 6 June 2003.

[9] For example, Adam *et al*. (2002) compute β-convergence and σ-convergence for some non-harmonized bank interest rates, using pre- and post-January 1999 dummies. The speed of convergence, measured by β-convergence, is shown by Adam *et al* (2002) to accelerate after the 1999 changeover; it is estimated to be high for the interbank rate, intermediate for the mortgage rate, and low for the rate on loans to firms. See Sander and Kleimeier (2001).

national average rates.[10] The idea is that, since European banking markets have undergone a significant process of integration in the last few decades, the current level of bank interest rates should reflect this convergence.[11] Our focus is twofold, on interest rate categories and on countries. In other words, we want to find out which interest rate categories are more homogeneous across Europe and which countries are more "similar" in a pairwise and/or multi-country sense. At this stage, there is no attempt at an economic explanation of rate setting.

In this first step of our analysis, we use two approaches to assess the homogeneity of interest rates in the euro area.

First approach: tests of zero-mean stationarity of differentials. The first method is utilized in the empirical literature on the convergence processes. Over recent years, the issue of convergence has attracted considerable attention mainly with reference to inflation, and has been studied essentially in the context of unit root and co-integration tests for panel data. Consistently with the existing literature, we begin our analysis following this approach.

The exercise is based both on the ADF (Augumented Dickey-Fuller) test and on the KPSS (Kwiatkowski-Phillips-Schmidt-Shin) test, applied to the bilateral differentials $\delta_t^{i\,j}$ between the bank interest rates of each pair of countries:[12]

$$\delta_t^{ij} = r_{i,\,t} - r_{j,\,t} \qquad (1.a)$$

[10] In order to analyze long-run convergence one could chain-link the new harmonized statistics with interest rate series previously used by the Eurosystem (the so called "RIR statistics", retail interest rates; ECB Monthly Bulletin stressed that RIR statistics "should be used with caution and for statistical purposes only, primarily to analyze their development over time rather than their level"). However, there are doubts whether this is legitimate. The latter statistics, while much longer, are not harmonized. The two sets of series overlap for only a very short time (the first half of 2003); looking at coefficients of variation over that time, the new statistics differ significantly from the previous ones in terms of level and sometimes even trend (Figures 4-5). Therefore any analysis based on chain-linking old and new statistics has to be very careful and we do not attempt it in this paper.

[11] In this light, the analyses of margin and level differences would provide similar indications; possible different implications in the margins analysis would be seized by focusing on the instrument categories. Moreover, the product-specific rates analysis can show a different degree of homogeneity in some markets, which could pass unnoticed in the margin analysis. For the sake of completeness, however, we extended the analysis (see below) to two spreads: the first between the average rate on total loans to households and on total deposits, and the second between the average rate on total loans to firms and on total deposits.

[12] For the methodological details, see Bell, Dickey and Miller (1985); Kwiatkowski *et al*. (1992); Hobjin and Franses (2000); Harvey and Carvalho (2002); Busetti *et al*. (2004).

where:

$r_{i,t}$; $r_{j,t}$ are the interest rates, specific to each test, for countries *i* and *j* (i ≠ j) in month *t*; *t* = 1, 2, …, 27 months; *i*, *j* = 1, 2, …, *n* countries; *n* is not the same in all interest rate categories.[13]

According to the strategy proposed by Harvey and Carvalho (2002), we can state that two countries have homogeneous interest rates when the interest differential δ_t^{ij} between them is a zero-mean stationary process. The ADF test, preliminarily, verifies weather the differentials δ_t^{ij} are non-stationary processes. Then the KPSS test verifies the zero-mean stationarity of stationary δ_t^{ij}, rejecting the null hypothesis (zero-mean stationarity) for a large value of ξ statistic:[14]

$$\zeta = \frac{\sum_1^{27}\left(\sum_1^t \delta^{ij}\right)^2}{27^2\,\sigma_{LR}^{\ 2}} \qquad (1.b)$$

where σ^2_{LR} is a non-parametric estimator, robust to autocorrelation and to etheroscedasticity, of the long-run variance of δ_t^{ij}.

The two tests are repeated for the 14 bank interest rates listed in Table 1 and for all pairwise differentials among the 12 euro area countries. Table 4, second column, reports the total number of bilateral differentials for each bank interest rate: $n\,(n-1)/2$. It is equal to 66 when the interest rate category exists in all countries; it is equal to 55 for deposits redeemable at notice and to 15 for repos. The third column of Table 4 shows the outcomes of the ADF and KPSS tests: figures report the number of stationary and converging bilateral combinations at the 5 per cent significance level.

These results show a widespread heterogeneity between the bank interest ratesin the euro area countries. The homogeneity is relatively high only for interest rates on loans to

[13] For deposits redeemable at notice, data are missing for Greece; for repos, data are missing for Finland, Germany, Ireland, Luxembourg, the Netherlands, and Portugal.

[14] The unit root and KPSS tests have been run without intercept terms because, as shown by Busetti *et al.* (2004), they may tend to provide spurious evidence for the no convergence hypothesis.

non-financial corporations over €1 million, where 30 per cent of bilateral differentials are zero-mean stationary processes.

Second approach: tests of equality of estimated country coefficients. Similar outcomes emerge when we use the second approach, which is based on tests of equality of estimated country coefficients in each interest rate category and verifies the statistical significance of differences in levels. At this stage, however, the only independent variables are time and binary country dummies.

Again we use the 14 bank interest rates listed in Table 1 as dependent variables in as many regressions. All regressions are of the form:

$$r_{i,t} = \alpha_1 \, m^1_{i,t} + \ldots + \alpha_{27} \, m^{27}_{i,t} + \beta_1 \, d^1_{i,t} + \beta_2 \, d^2_{i,t} + \ldots + \beta_n \, d^n_{i,t} + \varepsilon_{i,t} \qquad (2.a)$$

where:

$r_{i,t}$ is defined as in equation (1);

α_p and β_k are coefficients;

$m^p_{i,t}$ is a time (monthly) dummy equal to 1 when $p = t$, and 0 otherwise;

$d^k_{i,t}$ is a country dummy equal to 1 when $k = i$, and 0 otherwise;

$\varepsilon_{i,t}$ is an error term.

The number of observations is 324 (12*27) when the interest rate exists in each euro area country, smaller otherwise.[15]

Statistical tests of the significance of bilateral differentials for each pair of countries are used to assess the pairwise similarity between countries. The tests verify the null hypothesis that each pair of coefficients, estimated in the regression equations, is equal:

$$H_0: \beta_i = \beta_j \qquad (2.b)$$

[15] The observations are 297 for deposits redeemable at notice and 162 for repos.

We test the null hypothesis that coefficients are equal at the 5 per cent significance level, and we accept or reject the null hypothesis on the basis of the $F[1, 27n - k]$ statistic. When the data do not reject the equality of coefficients, we say that the bilateral interest rate differentials are not significant and therefore the interest rates for the pair of countries are similar.

Table 4, fourth column, reports the number of cases in which the bilateral differentials are not significant. The results are partially different from the former approach, mainly for repos and loans to firms of more than €1 million, but substantially confirm the first impression: the interest rates level is not homogeneous across countries and hence the European banking industry still appears highly segmented.

Nevertheless, some instrument category interest rates are more homogeneous. Figure 6 reports, for each interest rate category, the percentage share of non-significant differentials on total differentials. Interest rates on repos are much more uniform than those on the remaining deposits; lending interest rates for non-financial corporations are more uniform than for households; and for large loans (i.e. loans of more than €1 million) than for small loans (i.e. up to €1 million). These results suggest that, when bank customers are more informed and more financially developed (e.g. repos versus overnight deposits, enterprises versus households, large versus small corporations), there are more choices at their disposal and geographical segmentation becomes less relevant; thus average interest rates tend to be more uniform across the euro area.

Both methods allow us also to verify whether interest rates are homogeneous for at least some pairs of countries. Table 5 summarizes the main results concerning the bilateral equality of coefficients.[16] The upper panel reports the total number of bilateral differentials for each pair of countries. The lower panel shows the number of cases in which the bilateral differentials are non-significant. The total number of bilateral differentials is equal to 11

[16] To improve the fluency of the paper we report country-by-country analysis only for the second approach, since outcomes of the two models are substantially similar; in addition, the second approach is used in the rest of the paper.

when all rate categories exist for a pair of countries.[17] Figure 6 reports, for each country, the percentage share of non-significant differentials in total differentials.

In general, smaller countries (Belgium, Austria and Luxembourg) have a larger total number of non-significant bilateral differentials. Geographical proximity, cultural characteristics and institutional banking patterns do not seem to explain the statistical similarity between interest rates. For example bank interest rates do not appear similar either between the Netherlands and Belgium or between Spain and Portugal.

Our second approach is less sophisticated than the first one, but it is nonetheless used in empirical literature. Levy and Panetta (1993) carry out a similar exercise to analyze the similarity of real interest rates in G7 countries between the 1960s and 1980s. Jackson (1992) studies the transmission of interest rate shocks in different U.S. regions, using a set of regional dummies and taking significance of regional dummies as evidence for market segmentation. Moreover, this second approach allows us to take the analysis further by inserting the determinants of interest rates, and is then used, in place of the former one, in the rest of the paper.

3.1. A benchmark of integration: Italian regions versus euro area countries

For a better understanding of the previous results, we have repeated the same econometric exercise for the 20 regions of Italy. The idea is that the bank interest rates should be more homogeneous in an area (Italy) with the same legal system, with bank customers that have more similar features, and with same macroeconomic conditions.[18]

We have adopted the same simple econometric specification as in equation (2), regressing the bank interest rates of Italian regions on 20 dummies (one for each Italian region instead of for the 12 euro area countries) and on 10 quarterly time dummies (instead of the 27 monthly dummies of the euro area equation). The test has been carried out using

[17] The three aggregate rates (total deposits of households, total loans to households and total loans to non-financial corporations) are excluded from this analysis.

[18] In other words, the banking system of a single country should be integrated, and therefore it should represent a benchmark for assessing the level of euro area integration.

quarterly data on interest rates from the Italian Central Credit Register.[19] To enhance the comparison between Italian data and those of the euro area countries, we have selected six aggregate rates (3 for lending and 3 for borrowing interest rates) that are defined similarly in the national Central Credit Register and in Eurosystem statistics.

Figure 7 shows that the percentage share of similar interest rates is larger for Italian regions than for euro area countries.[20] It is interesting to note the similar percentage of non-significant differentials, both in Italy and the euro area, on bank overdrafts to non-financial corporations. In this case, the similar situation between Italian regions and euro area countries could be explained by the fact that this kind of loan has a higher credit risk and worse guarantees both in Italy and in the euro area.

To summarize, the results of the first step of our analysis simply show that, despite EU integration, the euro area banking market is still segmented and inter-country dispersion is greater than intra-country dispersion. This may be due to cross-country differences in the riskiness of customers, legislation, financial and banking structures, and/or banking practices. In any case, it is worth noting that, even at the national level, interest rates are not fully homogeneous and that, consistently with other analyses, deposits are more homogeneous than loans. In Banca d'Italia (1996) it is argued that the higher dispersion of bank interest rates on loans can reflect, even in a single country, different risk classes of borrowers and differences in local banking markets[21].

In this light, we repeated the same test of equality of estimated coefficients of Italian regions after adding in the equations three regressors influencing bank rates. The regressors are defined at regional level as well and they capture the effect on bank rates of the riskiness of borrowers (i.e. the ratio between bad loans and total loans, only in the lending rate regressions), of banking market concentration (Herfindahl indexes of loans and deposits,

[19] The data from the Italian Central Credit Register are only available on a quarterly basis. The Italian time series are longer than the euro area ones, but we have selected 10 quarters (from September 2001 to December 2003) in order to compare time samples of similar length. To check the robustness of the results we have repeated the exercise for Italian regions over a long-period horizon (20 quarters, from January 1999 to December 2003) and the results have remained substantially stable.

[20] Symmetrically, we used the first approach based on ADF and KPSS tests for Italian regions as well. The comparison of outcomes in Italian regions and in euro area countries produced similar differences in both approaches.

[21] See also De Bonis and Ferrando (1997)

alternatively) and of macroeconomic trends (growth rate of regional GDP). Figure 8 shows that these determinants further explain the residual differences among rates in Italian regions: after controlling for those factors, the percentage shares of non-significant cross-region rate differentials increase for all instrument categories.

As a consequence, we expect that these factors play a role even in the degree of integration of euro area bank interest rates: this is the argument of the next sections.

4. The determinants of national differences in euro area bank interest rates

Having established that cross-country differences are pervasive, the next step is to investigate the determinants of national interest rates, i.e. the origins of rate heterogeneity in the euro area. To this purpose we employ both "demand side" regressors, i.e. factors influencing interest rate setting behaviour related to the characteristics of bank depositors and borrowers; and "supply side" regressors, i.e. those determinants of rates that depend on banking system characteristics (both macroeconomic and aggregated microeconomic data). In formal terms, we adopt the following general specification:

$$r_{i,t} = \alpha'_t T_{i,t} + \beta'_i D_{i,t} + \gamma' X_{i,t} + \delta' Z_{i,t} + \varepsilon_{i,t} \qquad (3)$$

where:

$r_{i,t}$, $\varepsilon_{i,t}$ are defined as in equation (2.a); $T_{i,t}$ is a matrix of time (monthly) dummies; $D_{i,t}$ is a matrix of country dummies; in the notation of equation (2.b) we used vectors of dummies instead of matrices;

α, β, γ and δ are vectors of coefficients;

$X_{i,t}$ is a matrix of demand side regressors;

$Z_{i,t}$ is a matrix of supply side regressors.

We regress the 14 bank interest rates of each euro area country analyzed in the previous sections on matrices of their determinants. The matrices $X_{i,t}$ and $Z_{i,t}$ include the same covariates in the regressions of the 5 categories of deposit interest rates; in the regressions of the 5 categories of lending interest rates to households; and in the 4 categories

of lending interest rates to non-financial corporations. The regressors are rates of change or ratios between variables.

Many channels may influence banks' price behaviour. We use an eclectic approach. Even if the systematic exploration of all determinants of bank interest rates were to go beyond the purposes of this paper, the regressors selected in our exercises should be representative of the main effects proposed in the literature. On the other hand, we do not allow for the decreasing official rates set by the Eurosystem in our sample time. First, official rates are country-invariant in the euro area, and thus they are not able to add clear explanations for national differences. Second, although the official rates are time-variant, the adjustment of national banking rates to monetary policy inputs occurs in the same months, and therefore the effect is captured by the time dummies included in our regressions.

The distinction between demand side and supply side regressors is partly conventional. Actually, the two kinds of explanatory variables affect interest rates together. Moreover, there is not always a clear difference. For example, we regard the composition of bank balance sheets as a factor influencing interest rates on the supply side, but it depends on customer preferences as well. Nonetheless, we try to disentangle the two effects. The aim of this distinction is to stress the different influence of two kinds of variables on interest rate heterogeneity. Moreover, in the next section, we exploit this distinction to define banking products in a homogeneous way.

The descriptions of variables, data sources, OLS estimates and robustness checks are detailed in the Methodological Appendix. The main econometric outcomes are summarized in Table 6, where the signs of coefficients at the 5 per cent level of significance are grouped for the three kinds of bank rates: on deposits, on loans to households and on loans to non-financial corporations. Here we highlight the basic economic sense of the results and examine the correspondences with the relations proposed by the literature. The next three sub-sections refer to three kinds of determinants of interest rates. The first sub-section concerns the demand side explanatory variables. The other two sub-sections refer to supply side explanatory variables: the first includes the bank operative characteristics, the second covers the banking systems structural characteristics.

4.1 Demand side explanatory variables

The demand side regressors are the GDP change rate; households' disposable income; an indicator of alternative financial saving; an indicator of alternative sources of financing; and average firm size. A different set of regressors is used in equation (3) for deposit rates, for lending rates to households and for those to non-financial corporations.

Real GDP growth

Economic theory suggests that the increases in GDP positively affect credit demand, and hence lending rates, if they are permanent, while their effect on deposit rates is more ambiguous (Melitz and Pardue, 1973).

As stressed by Kashyap, Stein and Wilcox (1995), interest rates on loans are positively influenced by real GDP growth, because better economic conditions improve the number of projects becoming profitable, thus increasing credit demand. But at the same time, only increases in permanent income have a positive influence on credit demand, while the transitory component of GDP should be associated with a self-financing effect that reduces recourse to bank loans (Friedman and Kuttner, 1993). Symmetrically, the interest rates on deposits could be negatively influenced by increases in the transitory component of real GDP, because only when unexpected income (transitory GDP) grows does the supply of deposits by customers increase, and therefore banks set lower deposit rates.

In our estimates, the real GDP growth rate is not significant for interest rates on deposits and on loans to non-financial corporations, while it is positive and significant for interest rates on loans to households.

Disposable income

Household disposable income (total disposable income divided by the number of households) is a different indicator from the GDP growth rate discussed previously. The

GDP growth rate is an indicator of general macroeconomic conditions, while disposable income is an indicator of the spending (saving) capacity of households. Therefore, there should be no problems of collinearity.[22]

The effect of disposable income on deposit interest rates can be negative *a priori* if increases imply an increasing supply of deposits, whereas it can be positive *a priori* if higher disposable income implies a decreasing supply of deposits (as consumed) or a stronger bargaining power of savers. Its effect on interest rates on loans to households should be negative, because it both decreases the demand for credit and increases households' bargaining power.

Our results seem to corroborate the latter hypothesis in relation to deposit rates, for which the sign of the coefficient is uniform, positive and significant. In the equations of lending rates to households the sign of disposable income is not uniform among instrument categories, but the negative effect prevails (4 out of 5 rate categories).

Alternative forms of saving

In the equations of borrowing interest rates we used the ratio between Government bonds and GDP as an indicator of financial investment. The idea is that intermediation spreads will be adversely affected if substitutes to banking products appear on financial markets, both when households have access to alternative financial instruments and when firms issue securities on financial markets as a substitute for bank loans.

In our exercises, as expected, the availability of alternative financial investments affects deposit interest rates positively: in the countries where savers have at their disposal more financial instruments, the supply of deposits decreases, and therefore banks set higher deposit rates.

Alternative financing sources

[22] According to standard consumer theory, decisions of spending (and saving) depend on households income and wealth. The measures of financial wealth of households in national financial accounts are not available for all euro area countries.

Symmetrically to the use of an alternative form of saving in the deposit rate equations, we employed an indicator of alternative sources of financing in regressions of interest rates on loans to non-financial corporations. We used, as indicator of direct finance, firms' market capitalization on bank loans.[23]

Direct finance competes with bank loans and therefore it should reduce lending rates. By contrast, in our regressions, where firms issue a greater quantity of shares, banks set higher lending rates. A possible explanation for this apparent paradox is that the degree of availability of direct finance changes the composition of bank borrowers. Direct financing is usually less expensive than intermediate financing and therefore loan applicants are only those agents that cannot obtain direct debt in financial markets, either because their reputation is insufficient (Diamond, 1991) or because they do not have enough capital or collateral (Holmström and Tirole, 1997). When direct financing increases, more and more firms receive funding directly from the market, and hence the few firms that continue to apply for bank loans are the riskier ones and must pay higher interest rates.

Risk exposure

The probability of bankruptcy of the customer is an important determinant of loan interest rates. Lending rates include a risk component (the risk of default), which is influenced by the borrowers' economic prospects and by the quality of collateral. Banks that invest in riskier projects will ask for a higher interest rate return in order to compensate for the higher percentage of loans that may have to be written off.[24] Consequently, cross-country

[23] In our estimates we used corporate bonds as well. See details in the Methodological Appendix.

[24] The link between level of interest rates, risk, collateral and relationship banking is quite complex and economic theory suggests contrasting views. Credit institutions do not necessarily adjust the interest rate with rising risk. Banks could choose to ration the credit supply in order to avoid adverse selection and moral hazard (Stiglitz and Weiss, 1981). Moreover, the provision of collateral or relationship banking might decrease lending rates by reducing the problem of asymmetric information. As is well documented in the literature (Lummer and McConnell, 1989; Petersen and Rajan, 1994; Boot, 2000), close customer relationships between firms and banks, owing to a steady flow of information, increase the expected value to the bank of a continuation of the relationship and enable loans to be granted at more favourable conditions as to interest rates and volume. On the other hand, recent banking literature (Manove, Padilla and Pagano, 2000) has argued that collateral may have a perverse, negative effect on banks' risk because it may reduce screening and monitoring of the debtors. Similarly, relationship banking may result in higher interest rates (Angelini, Di Salvo and Ferri, 1998), which can be attributed to a lock-in effect of the borrowers and stronger bargaining power of the banks.

variations in the interest rate level might arise from differences in the risk profiles of domestic borrowers.

We used, as a proxy of the riskiness of loan applicants, the ratio between bank total loss provisions and total loans. The simple idea is that where banks have larger loss provisions, the borrowers are riskier.[25]

Our results confirm that the level of lending interest rates to non-financial corporations rises with an increase in risk. On the contrary, our risk-related variable does not have a uniform effect for lending rates to households. It is worth noting that, because of the lack of better information, the proxy we used as a measure of risk exposure, i.e. the ratio between bank total loss provisions and total loans, is more relevant for firms than for households.

Average firm size

The average firm size, measured by non-financial corporations' value added divided by the number of firms, can influence interest rates on loans, in the sense that lending rates tend to be lower for larger firms. The descriptive statistics indicate that the interest rate on loans over €1 million is lower than on loans of up to €1 million. The reason is that when firms are larger, the bargaining power of credit institutions declines and they then quote lower interest rates. Our econometric exercises corroborate this idea, showing that average firm size in a country is negatively and significantly correlated with lending rates.

4.2 Supply side explanatory variables: bank operating characteristics

[25] The share of loss provisions on total loans could act as a proxy also for the capacity of the legal system to safeguard lenders' rights: again, when banks are forced to make larger loss provisions it is because the legal system is less efficient. Actually, in some specifications we used as a proxy of legal and judiciary system (in)efficiency another variable: the usual duration of enforcement procedures for mortgage loans. The results confirm that where the time taken for the procedure is longer, lending rates tend to increase. The inclusion of this regressor did not distort the other results of the estimates, but we eliminated it because the available data are time-invariant. See Cecchetti (1999) and the Methodological Appendix.

Bank balance sheet characteristics are bank operating costs, bank non-interest income, bank liquidity, bank capitalization, bank liability structure, and bank asset structure. A different set of regressors is used in equation (3) for deposit and lending rates.

Bank operating costs

In the Monti-Klein model (Monti, 1972; Klein, 1971), assuming barriers between markets, banks set lending and borrowing interest rates by applying, respectively, a mark-up and a mark-down both on a refinancing rate and on management costs. If this is the case, banks' operating costs should have a positive effect on interest rates on loans and a negative effect on deposit rates.

In our estimates, the coefficient of the variable "operating costs" has mixed signs when the dependent variables are the specific components of average interest rates on deposits and on loans to households. However, it is significant and has the expected signs in the regressions of interest rates on loans to non-financial corporations (significantly positive), on total deposits (significantly negative) and on total loans to households (significantly positive). This makes sense because it is more likely that banks apply mark-ups and mark-downs, as suggested by Monti-Klein, on average interest rates and not on their specific components.

Bank non-interest income

We also employed a variable measuring the share of non-interest income in bank balance sheets. The idea is that, because of falling net-interest spreads in the past few decades, European banks have been shifting their focus away from interest-generating activities, such as deposit taking and lending, towards more profitable fee-generating services. The different intensity of this shift in each banking system could affect national differences in interest rates.

Our results show that in countries where the proportion of bank profits depends more on services, banks set higher interest rates on deposits and lower interest rates on loans to households. This outcome could indicate that banks compensate lower lending rates and

higher deposit rates with higher fees for financial services. Or, in other terms, since banks can count on several sources of revenue, when the competitive pressure is strong on a market segment, banks seek to make higher profits in other segments.

If this is the case, banking services should be seen as a bundle of products, the bank customers would buy banking services as a package. Hence price homogeneity and banking market integration should be analyzed for the entire package and not for its components. However, these suggestions are mainly issues for future research. In fact, the effect of non-interest income proportion is clear for deposits (positive) and for loans to households (negative), but it is not significant for loans to firms.

Bank liquidity and capitalization

Our regressors include some aggregated balance sheet items. The first two are a measure of national banking system liquidity (cash plus holdings of Government bonds as a share of total assets) and an indicator of bank capitalization (capital and reserves as a share of total assets). The inclusion of these regressors is in line with the suggestions of bank lending channel theory. According to this strand of research, when policy rates decrease (as in the time period analyzed), liquid and well capitalized banks let interest rates on loans fall (and interest rates on deposits increase) more than banks with a low liquid-asset and a low capital-asset ratio (Bernanke-Blinder, 1988; Bernanke-Gertler, 1995; Thakor (1996); Kashyap-Stein, 1995 and 2000; Kishan-Opiela, 2000). Actually, the bank lending channel theory refers to microeconomic bank-specific features. Lacking comparable micro information, we used macro-level average data in the hope that distributional issues would not distort the picture too much.

In our estimates, highly-capitalized banking systems have lower lending rates and higher deposit rates; highly-liquid banking systems have lower lending rates to non-financial corporations, and higher rates to households. Last result apart, these outcomes are consistent with previous empirical work, both on Italian lending rates (Angeloni *et al*., 1995; Cottarelli *at al*., 1995) and on euro area interest rates (Ehrmann *et al*., 2001 and 2003; Gambacorta, 2001 and 2003; Angeloni, Kashyap and Mojon, 2003).

Bank liability structure and bank asset structure

Two more regressors are suggested by the bank lending channel literature: the ratio between deposits and total liabilities (liability structure indicator) for deposit rates, and the ratio between long-term loans and total loans (asset structure indicator) for lending rates.

The first indicator, proposed by Berlin and Mester (1999), is based on the idea that banks that finance themselves mainly through bonds, rather than deposits, will set higher deposit rates (and adjust them by more) because their liabilities are more affected by market movements and their refinancing costs then increase contemporaneously and to a similar extent to market rates. In other words, when banks hold a large amount of deposits instead of bonds, they do not fall under pressure from market rate movements and can afford to pay lower rates.[26] Accordingly, in our estimates, banking systems in which deposits account for a larger share of liabilities set lower rates on all deposit categories but repos.

With reference to the second indicator (asset structure), banks that have a higher proportion of long-term loans should set lower lending rates for two reasons. First, they could be expected to care more for credit relationships with their customers, and therefore should grant loans at more favourable conditions (Berger and Udell, 1992); second, banks with long-term customers could set lower lending rates as part of an implicit risk-sharing agreement, based on the risk-aversion of their better borrowers (Fried and Howitt, 1980). Accordingly, in our estimates the asset structure indicator is inversely correlated with lending rates, both to non-financial corporations and to households.

4.3 Supply side explanatory variables: structural characteristics of banking systems

[26] See also Favero, Giavazzi and Fabbi (1999); Gambacorta (2005).

Banking system structural characteristics are the same for both deposit and lending rates: bank international presence, banking market concentration, bank average size and bank mergers and acquisitions.

Banks' international presence

The share of foreign banks in a market can be an indicator of competitive pressure, and, according to the theory, increasing competition would lead to lower loan interest rates and higher deposit interest rates. Moreover, increased international presence should be accompanied by an increase in cross-border activity. This might homogenize banking behaviours and result in more integrated retail banking markets. In our exercises, a larger presence of foreign banks, measured by the market share of branches and subsidiaries of non-domestic banks as a percentage of total assets, positively affects the level of interest rates on deposits, negatively affects the lending rates to households and positively the lending rates to non-financial corporations.

Banking market concentration, bank average size and bank M&As

We tested three kinds of variables concerning the banking system structure: market concentration (i.e. the share of the 5 largest credit institutions in total assets); bank average size (i.e. total assets on number of banks); and banking M&As (i.e. number of domestic bank mergers and acquisitions on total number of domestic banks).

The banking literature underlines two possible impacts of concentration on the pricing behaviour of banks. Following the Monti-Klein model, and in general the class of models applying the structure-conduct-performance approach to banking activity (Berger and Hannan, 1989), intermediation margins are higher when banks have greater market power. Therefore, as market power increases, i.e. as the market becomes more concentrated and the intensity of competition decreases, mark-ups and mark-downs increase, and banks set lower deposit rates and higher lending rates.[27] By contrast, a second class of models, the so-called

[27] Symmetrically, as the intensity of competition increases, rates on loans (rates on deposits) become less (more) sensitive to monetary policy tightening.

efficient-structure approach (Demsetz, 1973), suggests an inverse relation between rates and concentration. In this view, concentration is due to more efficient banks taking over less efficient counterparts; therefore, more concentrated markets should be associated with increased efficiency and with lower management costs, and hence concentration should have a negative impact on spreads.[28]

All our indicators of market concentration provide evidence in favour of the structure-conduct-performance hypothesis. More market concentration, a larger bank average size and the recent process of consolidation increase the market power of banks, and the effects tend to be negative on deposit rates and positive on lending rates. By contrast, it is interesting that the systems with on average larger banks set lower lending rates to firms.

5. Turning again to test for national differences: demand and supply effects on banking market segmentation

In this section we repeat, on equation (3), the initial exercise on equality of estimated country coefficients described in equations (2.a – 2.b). In fact, in equations (2.a – 2.b) we did not take account of national characteristics because the aim was only to test for the existence of cross-country homogeneity/heterogeneity in the level of interest rates on the raw data. Now we repeat the same exercise after controlling for those factors that should explain the differences. In other terms, if equation (3) allows us to homogenize banking products, i.e. to "clean up" data from factors that differentiate otherwise identical services, we can effectively investigate rate homogeneity and study the effect of those factors on market segmentation. For example, if loan applicants are different because they do not belong to the same credit risk class, the underlying loan is not identical. On the contrary, once the risk profile of borrower has been controlled for, if the interest rates become similar, we can say the rates are homogeneous.[29]

---

[28] See also Focarelli and Panetta (2003); Hannan and Prager (2004).

[29] The euro area bank customers are different even if the ongoing integration process in the euro area real economy has progressively increased the similarities between them. Similar considerations are present in Eichengreen (1984) and Bodenhorn (1995). They criticized the results of Stigler and Sherwin (1985), who had investigated the deregulation process of the U.S. banking system by testing the nominal interest parity on mortgage loans. Eichengreen (1984) and Bodehorn (1995) argued that the declining interest rate spreads found

First, we test for the equality of country coefficients employing in equation (3) only the "demand side" regressors; then we repeat the same test on the country coefficients resulting from the general specification of equation (3) with both demand and supply covariates. We distinguish the effect of the demand regressors from the overall effect, because the former should make it possible to take into account only the characteristics of bank customers, while the overall effect allows us to see how the characteristics of national banking systems influence euro area segmentation. The demand side factors certainly define a product, while it is disputable whether the same goes for the supply side factors. Undoubtedly, in our example a loan is comparable if the risk profile of the borrower is comparable. But market power also differentiates the perception of goods, and therefore it can be taken into account as well. In any case we disentangle the two effects. Therefore, the supply side factors either contribute to define a product or show the effect we should see on bank prices if euro area banking systems became more homogeneous. [30]

Table 4 (fifth and last column) and Table 7 (upper and lower side) report the various results of the statistical tests on the significance of bilateral differentials, respectively after controlling for the demand side regressors (second step of our analysis) and for the overall effect of both demand and supply side regressors (third step in our terms). Figure 9 shows, with differently coloured histograms, the percentage shares of statistically similar differentials in each of the three steps of our exercise. As expected, the similarities progressively increase, moving from the tests based on only time and country dummies to those based on demand regressors and up to those based on all the regressors. Therefore, when our estimate takes into consideration the effect of the characteristics of national customers and then also of national banking systems, the similarity between countries and hence euro area homogeneity increase. In one case only (repos) the regressors do not have

---

by Stigler and Sherwin (1985) were due to increasingly the homogeneous characteristics of regional credit markets. See also Adam *et al*. (2002).

[30] Our exercise does not consider the effect of the fiscal framework. In our view, this should affect bank rates mainly on the demand side. In fact, what matters for bank rates is not the general taxation on banks, but the taxation on bank products (i.e. if deposit rates are taxable, if rates paid on mortgages are deductible, the tax deductibility of interest rates on non-financial corporations). The taxation on bank products can influence the behaviour of bank customers and hence interest rates. The issue is complex. The lack of harmonized data, the difficulty of finding good information or building a good proxy put us off including this effect in the exercise. However, its inclusion would probably strengthen our results.

explanatory power and the level of homogeneity is higher before controlling for national characteristics.[31]

Looking first at instrument-by-instrument results (Figure 9, upper side), after controlling for all the regressors, the share of non-significant differentials is over 60 per cent for four instruments and over or close to 50 per cent for six instruments.[32] In one case the homogeneity remains quite low (bank overdraft to households). Results confirm that the more sophisticated instruments, and those where the market power of bank customers counts, are characterized by more homogeneous prices.

Turning to country-by-country results (Figure 9, lower side), the percentage share of non-significant differentials progressively grows for all countries. After controlling for the overall effect of the regressors, it is close to or exceeds 50 per cent in ten countries (all except Spain and Portugal). The improvement is considerable for larger countries as well. Regarding the cross-country bilateral (pairwise) differentials, Table 7 confirms that geographical proximity and cultural characteristics do not systematically affect the similarity between interest rates. The number of non-significant differentials grows between Benelux countries but remains low between Spain and Portugal and between Germany and Austria.

6. Concluding remarks

In spite of the long European integration process and single monetary policy, the euro area banking markets are still segmented. The econometric analysis, comparing bank rate

[31] For repos the similarities increase moving from the second step to the third one, but they are still higher in the first step. It is to be noted that this instrument, compared with other deposit products, is more sophisticated and less widespread in euro area countries (see Table 2). These circumstances might have influenced the partially atypical results.

[32] The increasing results are confirmed for the two rates margins to which we extended the analysis. For the spread between the average rate on total loans to households and on total deposits, the number of similarities progressively grows from 1 out of 66 in the first step, to 13 in the second step until to 30 in the third step; for the spread between the average rate on total loans to firms and on total deposits, it grows from 2 out of 66, to 7 until to 17.

differentials in the twenty Italian regions with those of the twelve euro area countries, show that the degree of integration in a national banking market is higher than in the euro area.

However, if we take into account some “demand side” regressors and “supply side” regressors many differences disappear. The euro area prices appear different, because national bank products appear different or because they are differentiated by national factors. There is scope for some further interest rate convergence within the euro area. If banking services become more similar, the prices will become more similar as well.

Econometric results suggest that where the bank customer is likely to be stronger, because of greater market power or better information (corporations versus households, large versus small firms, repos customers versus current-account customers), interest rates tend to be more homogeneous across Europe. By contrast, geographical proximity and other elements of natural and structural “closeness” between banking systems do not systematically influence the similarity of their interest rates as much as could have been expected.

Further investigations of euro area integration will need longer time series on interest rates and new harmonized information on other indicators (for example on taxation). In the meantime, euro area cross-border activity is expected to increase. This might homogenize banking behaviour and result in more integrated retail banking markets.

METHODOLOGICAL APPENDIX

1. Econometric specification

In the regressions we adopted the following general specification:

$$r_{i,t} = \alpha'_t T_{i,t} + \beta'_i D_{i,t} + \gamma'_g X_{i,t} + \delta'_h Z_{i,t} + \varepsilon_{i,t}$$

where:

$r_{i,t}$ is the interest rate, specific to each regression, for country i in month t;

$t = 1, 2, \ldots, 27$ months (from January 2003 to March 2005);

$i = 1, 2, \ldots, n$ countries; n is equal to 12 when the interest rate exists in each euro area country;

$\alpha, \beta, \gamma, \delta$ are vectors (nt x 1) of coefficients;

$T_{i,t}$ is a matrix (nt x t) of time (monthly) dummies;

$D_{i,t}$ is a matrix (nt x i) of country dummies;

$X_{i,t}$ is a matrix (nt x g) of demand side regressors;

$Z_{i,t}$ is a matrix (nt x h) of supply side regressors;

g and h indicate the number of regressors, different in each regression, respectively, in matrix $X_{i,t}$ and in matrix $Z_{i,t}$;

$\varepsilon_{i,t}$ is an error term.

We regressed 14 types of bank interest rates on time, on a matrix of country dummies and on two matrices of their determinants. In the 14 equations, the dependent variables are the levels of euro area country bank interest rates on 14 instrument categories: 5 categories of deposit interest rates (total deposits, overnight, with agreed maturity, redeemable at notice and repos); 5 categories of lending interest rates to households (total loans to households, bank overdraft, for house purchase, consumer credit and for other purposes); and 4 categories of lending interest rates to non-financial corporations (total loans to firms, bank overdraft, up to and over €1 million).

We have selected all lending and borrowing interest rates on new business (for the period from January 2003 to March 2005) except those on deposits of non-financial corporations because of the low relevance of this category in several countries. We have chosen to focus on new business because, unlike outstanding amounts, these rates do not suffer from the national pre-euro affects; and on aggregated interest rates, overlooking the breakdowns by original maturity or initial period of rate fixation, because, while differences may exist for individual maturity and fixation period, this is not necessarily the case for the overall average interest rate.

The number of observations is 324 (12*27) when the interest rate exists in each euro area country, smaller in two cases: for deposits redeemable at notice, data are missing for Austria and Greece (therefore the observations are 297); for repos, data are missing for Finland, Germany, Ireland, Luxembourg, the Netherlands, and Portugal (162 observations).

The coefficients β_i of country dummies have been used for statistical tests of the significance of bilateral differentials for each pair of countries, and hence to assess the pairwise similarity between countries. The tests verify the null hypothesis that each pair of coefficients, estimated in the regression equations is equal:

$H_0: \beta_i = \beta_j; \qquad i \neq j.$

For example, for the interest rate on overnight household deposits we calculated 66 bilateral combinations: $n\,(n-1)/2$. We tested the null hypothesis that coefficients were equal at the 5 per cent significance level and we accepted or rejected the null hypothesis on the basis of the $F[1, 27n - (i + g + h)]$ statistic. When the data does not reject the equality of coefficients, we say that the bilateral interest rate differentials are not significant.

Type	Covariates	Description	In equation of	Mean	St. dev	min	Max
Demand side regressors $X_{i,t}$	Real GDP growth	Real GDP growth rate	All rates categories	0.194	0.681	-1.84	3.04
	Disposable income	Total disposable income on number of households	Deposit-lending rates to hous.	28.442	7.539	10.504	38.706
	Altern. form of saving	Government bonds as a ratio of GDP	Deposit rates	2.55	1.43	0.07	5.87
	Altern. financing source	Firms' market capitalization on bank loans	Lending rates to non-fin. corp.	1.348	1.194	0.243	5.382
	Risk exposure	Ratio between bank loss provisions and total loans	Lending rates	0.442	0.330	0.0	1.13
	Firms average size	Firms' value added on number of firms	Lending rates to non-fin. corp	1.611	0.35	0.734	2.395
Balance sheet factors $Z_{i,t}$	Bank operating costs	Operating expenses / average balance sheet total	All rate categories	1.648	0.490	0.54	2.68
	Bank non-interest income	Non-interest income / average balance sheet total	All rate categories	1.204	0.578	0.54	3.74
	Bank liquidity	(Cash + holdings of Government bonds) / total assets	All rate categories	0.043	0.041	0.0	0.191
	Bank capitalization	Capital and reserves as a ratio of total assets	All rate categories	0.063	0.017	0.035	0.104
	Bank liability structure	Total deposits as a ratio of total liabilities	Deposit rates	0.286	0.103	0.063	0.491
	Bank asset structure	Long-term loans on total loans	Lending rates	1.854	0.495	0.965	2.746
Banking system charact. $Z_{i,t}$	Banks' intern. presence	Market share of branches and subsidiaries of non-domestic banks as percentage of the total assets	All rate categories	23.730	24.767	4.74	94.56
	Bank market concentr.	Share of the 5 largest credit institutions in total assets	All rate categories	52.99	20.891	20.454	84.261
	Bank average size	Total assets on number of banks	All rate categories	3,905	2,586	502.8	12,007
	Bank M&As	Number of domestic bank mergers and acquisitions on total number of domestic banks	All rate categories	0.022	0.02	0.0	0.09

The matrices $X_{i,t}$ and $Z_{i,\,t}$ include the same covariates in the regressions of the 5 categories of deposit interest rates; in the regressions of the 5 categories of lending interest rates to households; and in the 4 categories to non-financial corporations. The matrix $X_{i,t}$ covers "demand side" regressors, while the matrix $Z_{i,\,t}$ contains "supply side" factors influencing interest rate-setting behaviour. All the regressors are change rates or ratios between two variables. The number of regressors g in the matrix $X_{i,t}$ is equal to 3 in the equations of deposit rates and in the equations of interest rates on loans to households; while it is equal to 4 in the equations of interest rates on loans to non-financial corporations. The number of regressors h in the matrix $Z_{i,t}$ is equal to 9 in the equations of all rates categories (see the Table).

2. Data sources

An element of the paper worthy of mention is the large use of European harmonized data collected by the ESCB. The data on bank interest rates have been recently harmonized. As long as possible, we have chosen harmonized figures also as covariates. Data sources, except for Italian regions, are these institutions collecting data at a European level.

Bank interest rates. In our regressions, the dependent variables are different interest rate categories. As stressed in the paper, starting from the reference month January 2003, the Eurosystem has collected new harmonized data on bank interest rates. New data are called MIR, the acronym for MFI interest rates. MFIs (monetary financial institutions) are the intermediaries that have been required to submit reports to the ECB since the start of the third phase of Monetary Union. The category comprises central banks, credit institutions and all other resident financial institutions whose business consists in receiving deposits and/or close substitutes for deposits from persons other than MFIs and in granting credit and/or making investments in securities for their own account. Regarding interest rates, the MFI reporting population mainly consists of banks. These new statistics provide data on the euro-denominated lending and deposit business of resident credit institutions vis-à-vis households and non-financial corporations; they follow harmonized statistical collection and classification principle. The data include 45 interest rate categories, 31 refer to interest rates

on new business and the remaining 14 on outstanding amounts. There are breakdowns by original maturity, notice periods or initial periods of interest rate fixation. In the regressions we used 14 aggregated instrument categories referring to interest rates on new business. The advantage of aggregation lies in the fact that differences may exist for individual maturity and fixation periods, but not necessarily for the overall average interest rate.

Bank balance sheet statistics. The amounts of deposits, short and long-term loans, holdings of securities, capital and reserves, total assets and total liabilities are drawn from the dataset of the ECB containing ESCB harmonized balance sheet statistics. The data are harmonized, monthly, and refer to banks and other monetary financial institutions. ESCB harmonized balance sheet statistics do not cover data on profits and losses and on non-performing loans.

Other bank balance sheet statistics. The figures on bank operating costs and on non-interest income have been constructed from the database on Bank Profitability maintained by the OECD. The data on risk exposure have been constructed from the sample figures published by Bankskope.

Bank structural data. The figures on banking market concentration, number of banks, bank M&As, and the share of foreign banks are calculated on data published by the ECB.

General economic data. GDP, number of firms, firms' value added, number of households, and households' disposable income are drawn from Eurostat. The figures on usual duration (number of months) of enforcement procedures for mortgage loans in euro area countries are drawn from European Mortgage Federation, "*Efficiency of Mortgage Collateral in the European Union*", June 2002.

Other financial data. Market capitalization of non-financial corporations and Government bonds are drawn from the dataset on security issues collected by the ESCB.

Bank interest rates in Italian regions. In section 3.1, we have repeated for the Italian regions the same exercise carried out for the euro area countries in order to compare euro area segmentation with that of a member state (benchmark). The quarterly data on Italian regions' bank interest rates are drawn from the Italian Central Credit Register (CR). The definitions are partially different in MIR statistics and CR data. To enhance the comparison we have selected the more similar aggregates (3 for lending and 3 for borrowing interest rates).

Banking and economic data on Italian regions. The regressors used in the equations of Italian regions' interest rates in section 3.1 are drawn from national sources: the regional data on bad loans and total loans and the Herfindahl indexes in each region have been calculated from Italian banks' statistical returns; the data on Italian regions' GDP are from the Italian national statistical office (Istat).

3. Robustness checks

The economic sense of the results is discussed in section 4 of the text. The aim of this section is to provide further information about the robustness checks of our estimates.

A first way to check the robustness of our results was to introduce progressively the additional explanatory variables in order to control for the possible presence of endogeneity. In the first specification, we used in each equation only the regressors that we called "demand side" factors. In the second one, we introduced bank balance sheet characteristics. The third step was to introduce banking system structural characteristics as well. The explanatory power of the three regressions has remained noteworthy (*Adj*-R^2 is around 0.99 for all the instrument categories); and the results have not changed. Even the signs of the significant coefficients have always remained the same, although the significance level has changed.

The further robustness check has been to modify the last whole specification by introducing interaction terms combining structural characteristics instead of using the single variables. The new specification, which contained two interaction terms (respectively

between bank average size and market concentration and between M&As and market concentration) instead of the single three variables, has not changed the results and the effect of the remaining regressors.

Another way to check the robustness of the results has been to substitute, where possible, the single regressors with similar variables. According to the theory one of the main factors influencing lending rates is risk exposure. We used, as a proxy of riskness of loan applicants, the figures on bank loss provisions drawn from the sample database maintained by Banksope. The simple idea is that where banks have larger loss provisions, the borrowers are riskier. We stressed that a harmonized definition of bad loans does not exist in ESCB harmonized balance sheet statistics. However, we have been able to use as alternative variable the statistics on write-offs/write-downs of loans collected by the ECB. These series, while harmonized and relative to the entire population of MFIs, are less long and not available for all the countries. In any case, the use of these data has confirmed that, when significant, risk exposure affects lending rates positively. Our idea is that the share of loss provisions on total loans should act as a proxy also of the legal system's capacity to safeguard lenders' rights: again, where banks are forced to carry larger loss provisions it is because the legal system is less efficient. However, we used as a proxy of legal and judiciary system (in)efficiency the usual duration of enforcement procedures for mortgage loans as well. The results confirm that where time taken for the procedure is longer, lending rates tend to increase. The inclusion of this regressor did not distort the other results of the estimates, but we eliminated it in the general specification because the availability of time-invariant data limited our analysis on country coefficients.

Other tests on alternative variables have not changed our results. We have used as indicator of banking market concentration the Herfindahl indexes in each country instead of the share of the 5 largest credit institutions in total assets. The results have remained the same, even if at a lower level of significance.

In the indicator of alternative financing sources we have added the securities issued by non-financial firms. The results have remained stable, but the data on securities issued are not available for all the countries.

Finally, we have tried to change the denominator of some regressors represented by ratios: we have substituted the number of households with GDP in the indicator of disposable income, and bank loans both with GDP and with the number of firms in the indicator of alternative financing sources. The results have always remained stable.

TABLES AND FIGURES

Table 1

BANK INTEREST RATES IN THE EURO AREA

(Average values: January 2003 - March 2005)

	Euro area		minimum		maximum		**Italy**
	mean	*St.dev.*	%	country	%	country	
Deposits – households	**1.47**	*0.50*	0.64	PT	2.30	NL	**0.77**
of which: overnight	**0.74**	*0.35*	0.14	FR	1.28	LU	**0.64**
with agreed	**2.05**	*0.23*	1.58	IT	2.29	FR	**1.58**
redeemable at	**2.04**	*0.83*	0.27	ES	2.74	NL	**0.97**
repos	**2.11**	*0.20*	1.85	FI	2.50	FR	**2.01**
Loans – households	**8.12**	*2.37*	4.18	LU	13.24	GR	**8.05**
of which: bank overdrafts	**9.91**	*2.52*	5.72	LU	14.05	GR	**8.65**
for house purchase	**4.11**	*0.47*	3.30	FI	4.78	DE	**3.88**
consumer credit	**7.24**	*1.65*	5.00	FI	10.09	GR	**9.11**
for other purposes	**4.35**	*1.14*	3,43	NL	7.25	PT	**4.68**
Loans – non-financial corp.	**4.90**	*0.95*	3.55	LU	6.63	GR	**5.51**
of which: bank overdrafts	**5.55**	*3.65*	4.42	PT	17.50	ES	**5.84**
up to €1 million	**4.22**	*0.65*	3.76	LU	5.92	PT	**4.24**
over €1 million	**3.22**	*0.39*	2.97	BE	4.91	IE	**3.14**

Table 2

EURO AREA
COMPOSITION OF BANK BALANCE SHEETS (*)
(percentage values; figures calculated on last quarter of 2004)

ITEM	ITA	GER	FRA	SPA	NET	BEL	LUX	AUS	GRE	POR	IRL	FIN
ASSETS												
Loans	69.7	74.1	61.9	73.6	79.2	61.9	60.0	73.8	69.9	77.3	50.5	73.2
of which: domestic customers	*48.5*	*40.0*	*29.1*	*55.4*	*45.5*	*24.5*	*3.1*	*38.9*	*49.1*	*53.8*	*21.3*	*45.9*
Securities	13.6	17.9	19.5	14.4	10.5	24.0	35.5	15.5	18.6	8.7	41.4	11.5
Shares and other equity	5.4	5.3	7.9	6.2	3.7	3.2	1.3	6.9	3.6	5.5	1.4	1.2
Fixed assets	2.0	0.5	0.7	1.1	0.3	0.4	0.4	0.8	1.5	0.9	0.3	0.3
Remaining assets	9.3	2.2	10.0	4.7	6.3	10.6	2.7	2.9	6.4	7.6	6.4	13.7
LIABILITIES												
Deposits	57.3	66.2	60.5	73.5	69.4	76.7	65.5	64.9	78.8	76.7	55.6	55.0
of which: domestic customers												
overnight	*22.6*	*9.9*	*7.3*	*12.0*	*9.3*	*7.8*	*4.7*	*10.3*	*35.7*	*13.5*	*6.2*	*20.7*
with agreed maturity	*1.7*	*13.3*	*7.3*	*16.3*	*7.9*	*6.0*	*4.7*	*20.8*	*14.8*	*21.2*	*6.5*	*7.7*
redeemable at notice	*2.8*	*9.0*	*7.8*	*8.6*	*12.6*	*16.2*	*0.7*	*0.0*	*1.3*	*0.0*	*1.0*	*4.2*
repos	*2.9*	*0.2*	*0.9*	*4.4*	*0.0*	*0.0*	*0.0*	*0.0*	*3.9*	*0.0*	*0.0*	*0.0*
Securities issued	18.6	24.2	13.8	9.8	17.6	6.6	8.7	24.6	0.3	8.3	12.9	17.2
Money market fund shares	4.3	0.5	7.6	3.3	0.0	0.2	18.5	0.0	6.3	0.3	19.6	5.0
Capital and reserves	6.9	4.3	6.5	8.0	4.0	4.1	4.8	6.0	7.9	8.6	5.0	8.2
Remaining liabilities	12.9	4.7	11.6	5.3	8.9	12.4	2.5	4.5	6.8	6.0	6.9	14.6

(*) "domestic" states for national residents.

Table 3

BANK INTEREST RATES IN THE EURO AREA
CHANGES BETWEEN JANUARY 2003 AND MARCH 2005

	Euro area		minimum		maximum		**Italy**
	change	*St.dev.*	%	country	%	country	
Deposits – households	**-0.34**	*0.12*	-0.23	DE	-0.69	LU	**-0.37**
of which: overnight	**-0.16**	*0.07*	0.02	DE	-0.56	LU	**-0.33**
with agreed maturity	**-0.66**	*0.19*	-0.54	PT	-0.78	FR	**-0.57**
redeemable at notice	**-0.34**	*0.12*	0.92	PT	-0.97	LU	**-0.05**
repos	**-0.71**	*0.23*	-0.33	AT	-1.15	FR	**-0.69**
Loans – households	**-1.03**	*0.33*	0.01	IE	-2.05	FR	**-0.91**
of which: bank overdrafts	**-0.69**	*0.27*	0.57	IE	-1.50	FR	**-0.60**
for house purchase	**-1.07**	*0.27*	-0.50	GR	-1.33	BE	**-0.99**
consumer credit	**-0.32**	*0.16*	-0.04	DE	-1.34	FI	**-0.93**
for other purposes	**-1.06**	*0.28*	-0.40	PT	-1.61	AT	**-1.05**
Loans – non-financial corp.	**-0.85**	*0.24*	-0.17	GR	-1.30	AT	**-1.11**
of which: bank overdrafts	**-0.79**	*0.23*	3.23	ES	-1.37	AT	**-1.05**
up to €1 million	**-0.97**	*0.25*	-0.31	LU	-1.20	AT	**-0.91**
over €1 million	**-0.66**	*0.21*	-0.18	FI	-1.07	AT	**-0.78**

Table 4

STATISTICAL TESTS OF THE SIGNIFICANCE OF BILATERAL DIFFERENTIALS BETWEEN NATIONAL BANK INTEREST RATES
(Outline by type of instrument)

	Total number of bilateral differentials	Number of statistically similar bilateral differentials			
		First step		Second step	Third step
		ADF test for unit root and KPSS test	with time and country dummies (**a**)	(a)+demand side regressors (**b**)	(b)+supply side regressors (**c**)
Deposits – households	**66**	**1**	**2**	**15**	**34**
of which: overnight	66	0	4	19	31
with agreed maturity	66	7	3	27	35
redeemable at notice	55	2	5	11	27
repos	15	0	11	4	8
Loans – households	**66**	**4**	**1**	**12**	**23**
of which: bank overdrafts	66	3	1	12	22
for house purchase	66	4	3	7	31
consumer credit	66	6	4	13	32
for other purposes	66	6	5	22	45
Loans – non-financial corporations	**66**	**3**	**4**	**7**	**16**
of which: bank overdrafts	66	2	8	26	42
up to €1 million	66	5	7	14	33
over €1 million	66	21	8	23	47

Table 5

SIGNIFICANCE OF BILATERAL DIFFERENTIALS BETWEEN NATIONAL BANK INTEREST RATES CROSS-COUNTRY ANALYSIS

Total number of bilateral differentials

	AUS	BEL	FIN	FRA	GER	GRE	IRL	ITA	LUX	NET	POR	SPA
AUS	-											
BEL	11	-										
FIN	10	10	-									
FRA	11	11	10	-								
GER	10	10	10	10	-							
GRE	10	10	9	10	9	-						
IRL	10	10	10	10	10	9	-					
ITA	11	11	10	11	10	10	10	-				
LUX	10	10	10	10	10	9	10	10	-			
NET	10	10	10	10	10	9	10	10	10	-		
POR	10	10	10	10	10	9	10	10	10	9	-	
SPA	11	11	10	11	10	10	10	11	10	9	10	-
Total	**114**	**114**	**109**	**114**	**109**	**104**	**109**	**114**	**109**	**109**	**109**	**114**

Number of non-significant bilateral differentials: with time and country dummies (a)

	AUS	BEL	FIN	FRA	GER	GRE	IRL	ITA	LUX	NET	POR	SPA
AUS	-											
BEL	4	-										
FIN	1	0	-									
FRA	0	3	1	-								
GER	2	2	0	0	-							
GRE	2	2	0	0	0	-						
IRL	0	1	0	2	1	1	-					
ITA	2	1	1	0	0	1	0	-				
LUX	2	1	3	0	0	0	2	0	-			
NET	2	2	0	1	0	0	1	1	1	-		
POR	1	0	2	1	0	0	0	1	2	0	-	
SPA	1	3	1	1	0	1	0	1	0	1	0	-
Total	**17**	**19**	**9**	**9**	**5**	**7**	**8**	**8**	**11**	**9**	**7**	**9**

Table 6

THE DETERMINANTS OF NATIONAL DIFFERENCES IN EURO AREA BANK INTEREST RATES SUMMARY ECONOMETRIC RESULTS

Explanatory variables		Effect on interest rates on		
		deposits	loans to households	loans to non-financial corporations
Demand side explanatory variables	GDP growth rate	n.s.	+	n.s.
	Disposable income	+	n.u.	n.a.
	Risk exposure	n.a.	n.u.	+
	Alternative financing sources	n.a.	n.a.	+
	Alternative forms of saving	+	n.a.	n.a.
	Firms' average size	n.a.	n.a.	–
Bank balance sheet characteristics	Bank operating costs	n.u.	n.u.	+
	Bank non-interest income	+	–	n.s.
	Bank liquidity	n.u.	+	–
	Bank capitalization	+	–	–
	Bank liability structure	n.u.	n.a.	n.a.
	Bank asset structure	n.a.	–	–
Banking system structural characteristics	Banks' international presence	+	–	+
	Banking market concentration	n.s.	+	+
	Bank average size	–	n.u.	–
	Bank M&As	–	+	n.s.

Legend: n.s.: non-significant coefficient.
n.u.: non-uniform effect of variable, for each instrument category.
n.a.: non-applicable variable.
\+ significant and positive coefficient (significance at 5 % level).
– significant and negative coefficient (significance at 5 % level).

Note: the Table shows the summary results of OLS regressions presented in the fourth section and in the Methodological Appendix. For the sake of brevity and synthesis, we did not report the analytical results; they are available from the authors upon request. The symbols ± indicate the signs of the coefficients when the effect of regressors on the dependent variable is significant at the 5 per cent level and uniform across interest rate categories, respectively for all kinds of deposit rates, and for all kinds of interest rates on loans to households and to non-financial corporations.

Table 7

STATISTICAL TESTS OF THE SIGNIFICANCE OF BILATERAL DIFFERENTIALS BETWEEN NATIONAL BANK INTEREST RATES CROSS-COUNTRY ANALYSIS

Number of non-significant bilateral differentials: (Table 5 - a) + demand side regressors (b)

	AUS	BEL	FIN	FRA	GER	GRE	IRL	ITA	LUX	NET	POR	SPA
AUS	-											
BEL	3	-										
FIN	6	4	-									
FRA	3	2	3	-								
GER	1	3	3	2	-							
GRE	3	3	2	2	4	-						
IRL	2	5	1	3	6	3	-					
ITA	3	0	3	1	1	3	4	-				
LUX	2	2	7	3	2	1	3	2	-			
NET	5	4	3	3	2	3	2	2	4	-		
POR	1	3	2	3	2	1	1	3	3	0	-	
SPA	5	4	3	1	2	2	4	3	3	3	0	-
Total	**34**	**33**	**37**	**26**	**28**	**27**	**34**	**25**	**32**	**31**	**19**	**30**

Number of non-significant bilateral differentials: (b) + supply side regressors (c)

	AUS	BEL	FIN	FRA	GER	GRE	IRL	ITA	LUX	NET	POR	SPA
AUS	-											
BEL	6	-										
FIN	7	6	-									
FRA	4	6	7	-								
GER	2	5	5	3	-							
GRE	4	6	4	5	5	-						
IRL	7	6	8	6	7	4	-					
ITA	4	9	5	6	4	7	7	-				
LUX	9	8	6	8	8	5	4	8	-			
NET	6	7	4	6	4	4	6	7	8	-		
POR	2	3	4	3	7	5	6	4	5	1	-	
SPA	5	4	5	3	5	4	7	5	7	2	3	-
Total	**56**	**66**	**61**	**57**	**55**	**53**	**68**	**66**	**76**	**55**	**43**	**50**

EURO AREA

Dispersion of interest rates on deposits of households

(coefficient of variation)

Figure 1

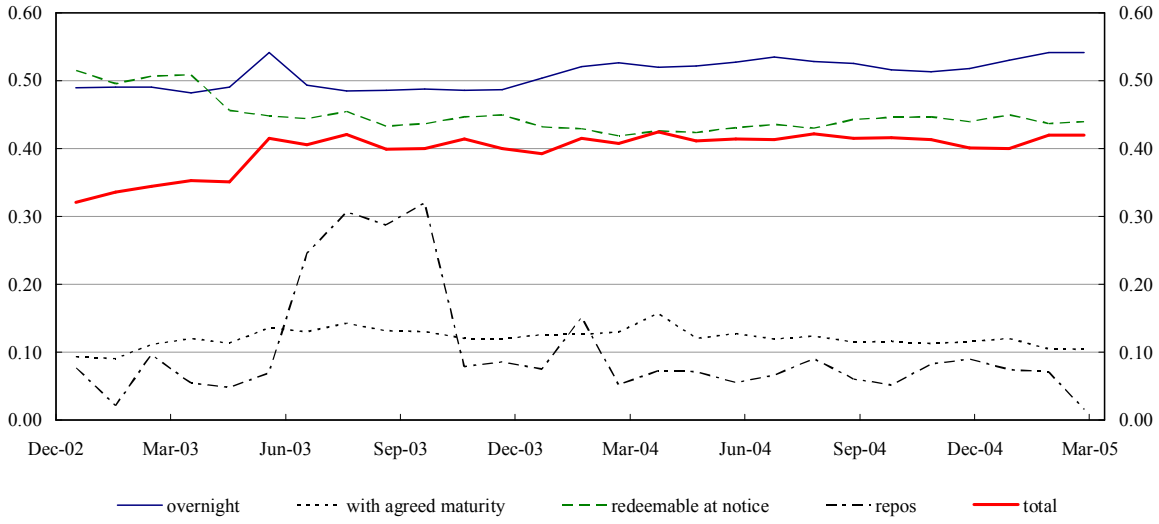
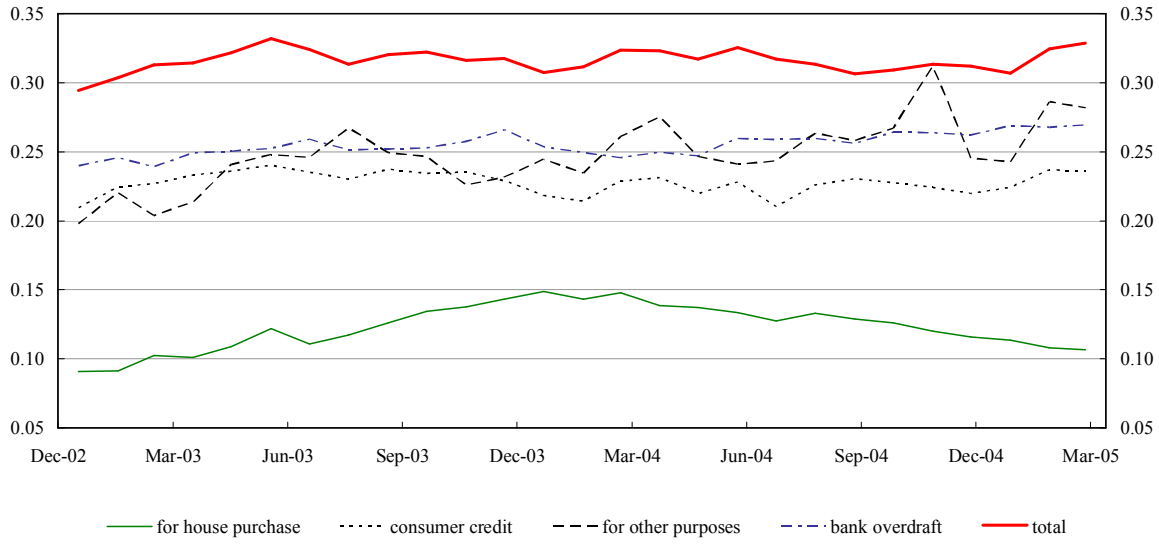


Figure 2

Dispersion of interest rates on loans to households

(coefficient of variation)



EURO AREA

Figure 3

Dispersion of interest rates on loans to non-financial corporations

(coefficient of variation)

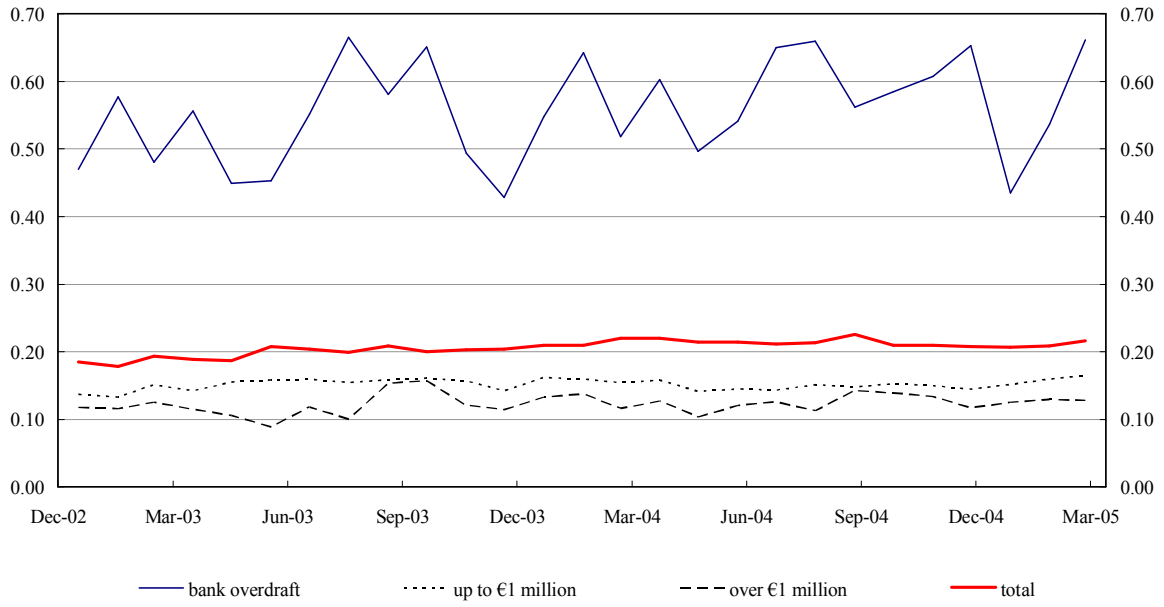
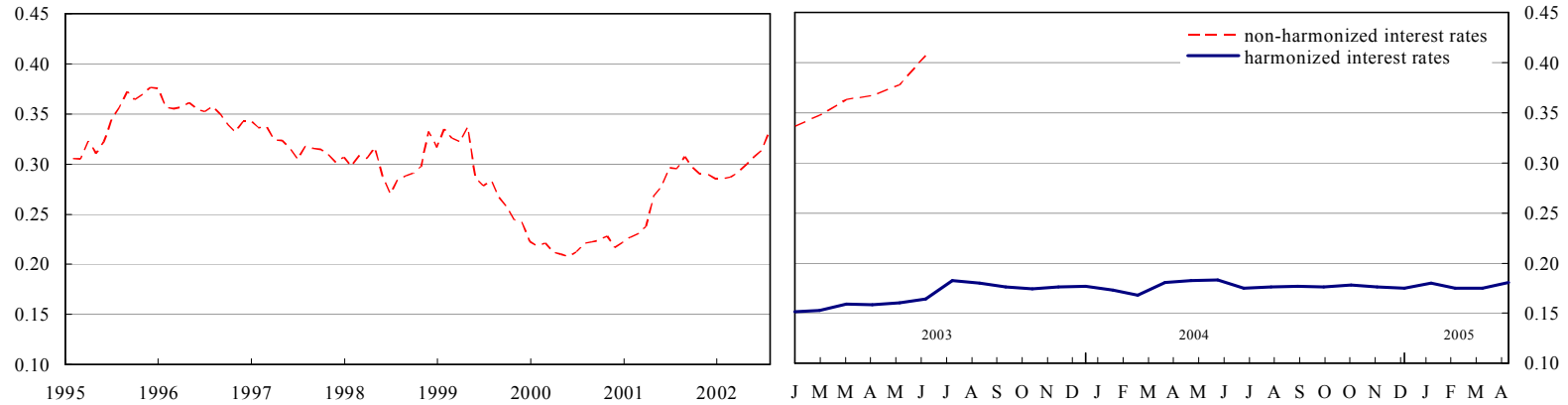


Figure 4

EURO AREA
COMPARISON BETWEEN HARMONIZED AND NON-HARMONIZED INTEREST RATES
(lending interest rates, coefficients of variation)

Interest rates on loans to non-financial corporations



Interest rates on loans to households for house purchases

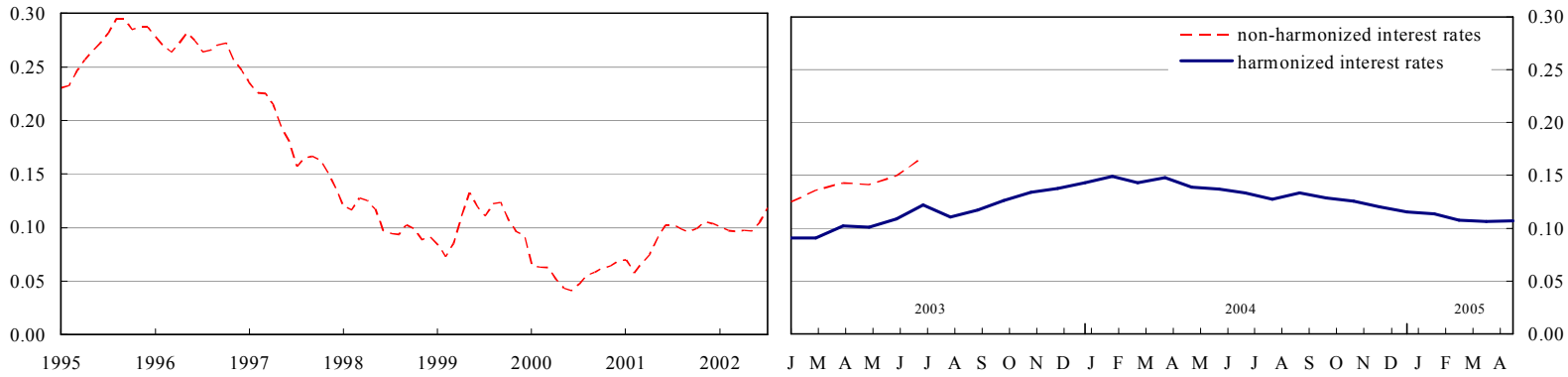


Figure 5

EURO AREA
COMPARISON BETWEEN HARMONIZED AND NON-HARMONIZED INTEREST RATES
(deposits interest rates, coefficients of variation)

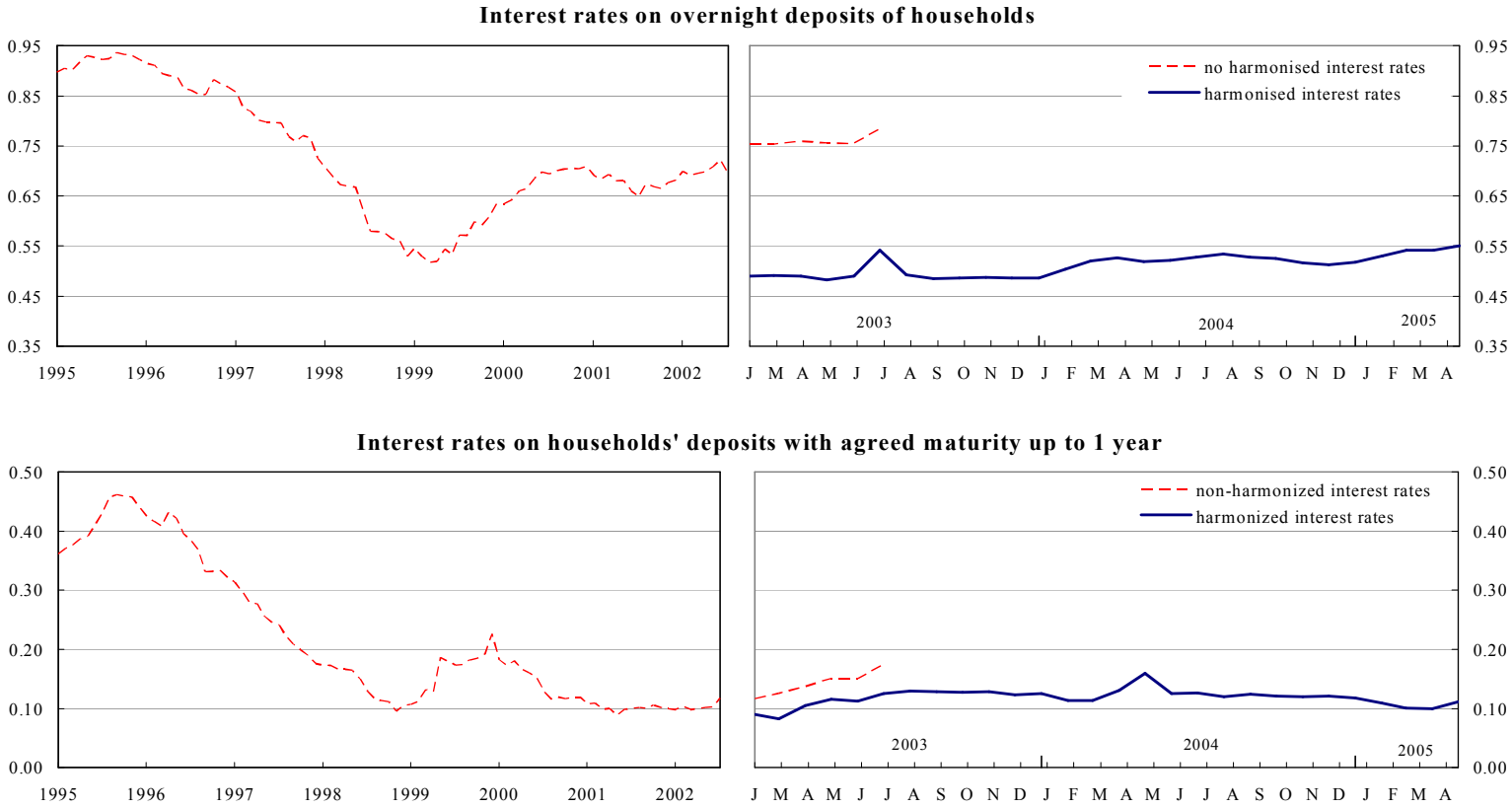
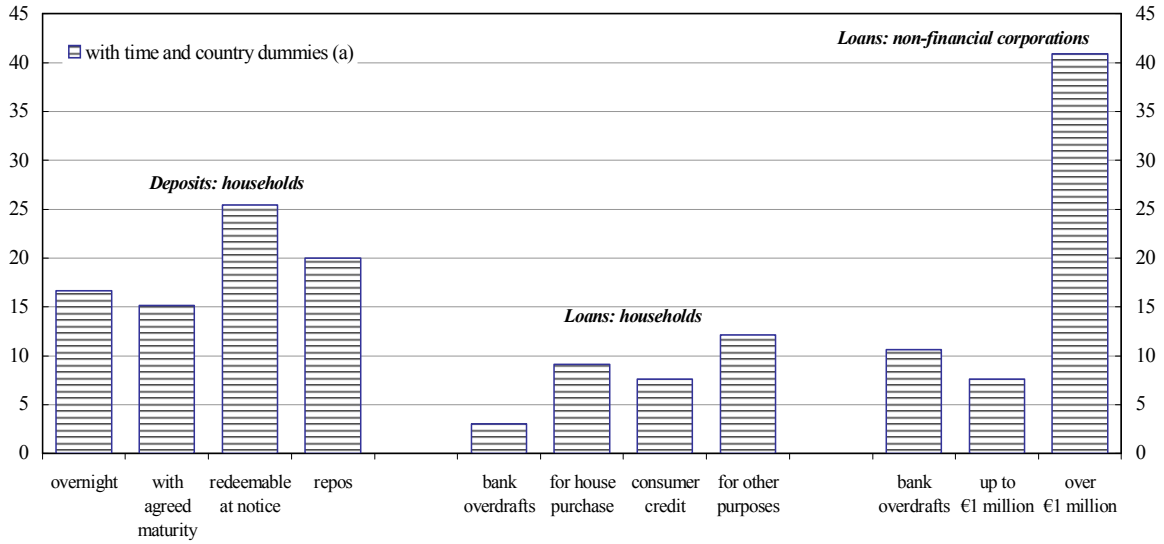


Figure 6

PERCENTAGE SHARES
OF STATISTICALLY SIMILAR BILATERAL DIFFERENTIALS
IN EURO AREA BANK INTEREST RATES

Outline by type of instrument and by country



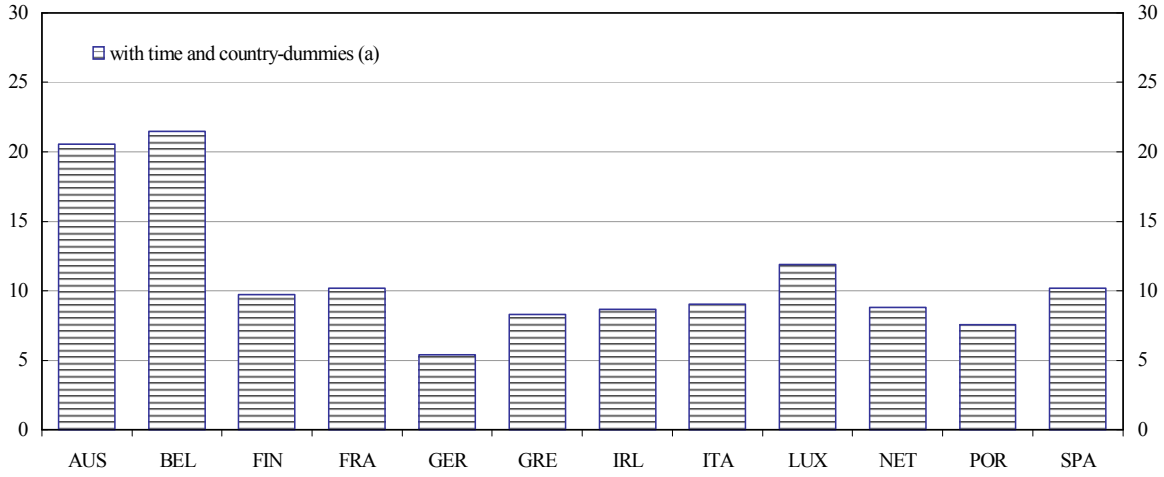


Figure 7

BANK INTEREST RATES

ITALIAN REGIONS VS. EURO AREA COUNTRIES

(% share of non-significant cross-section rate differentials)

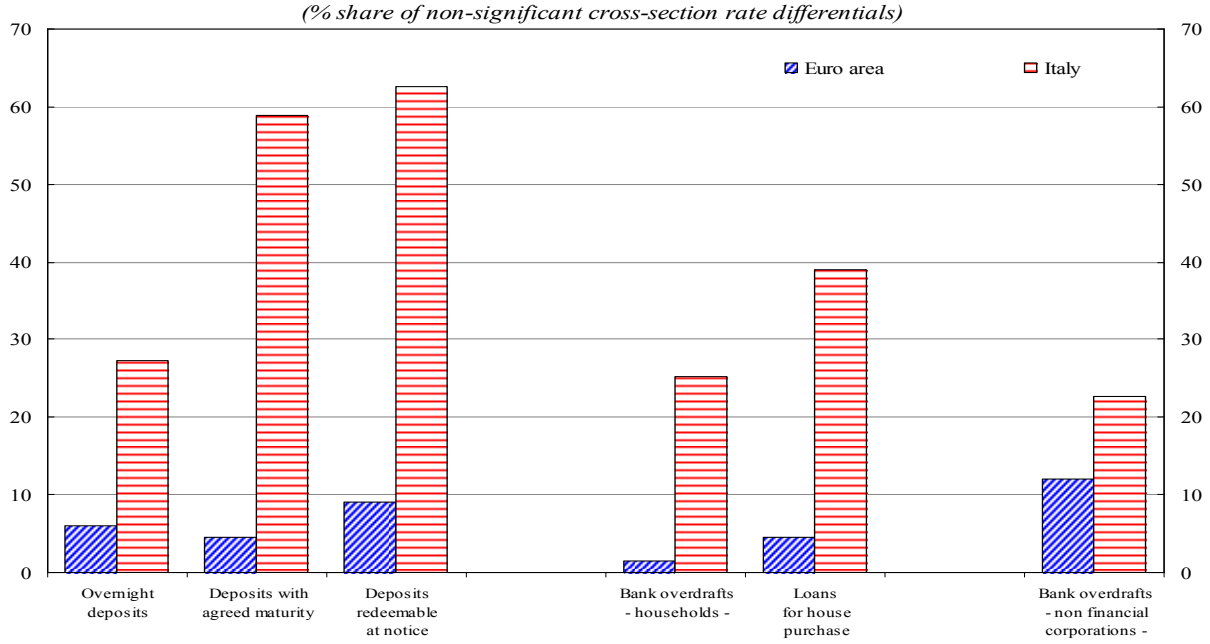


Figure 8

ITALIAN REGIONS

(% share of non-significant cross-section rate differentials)

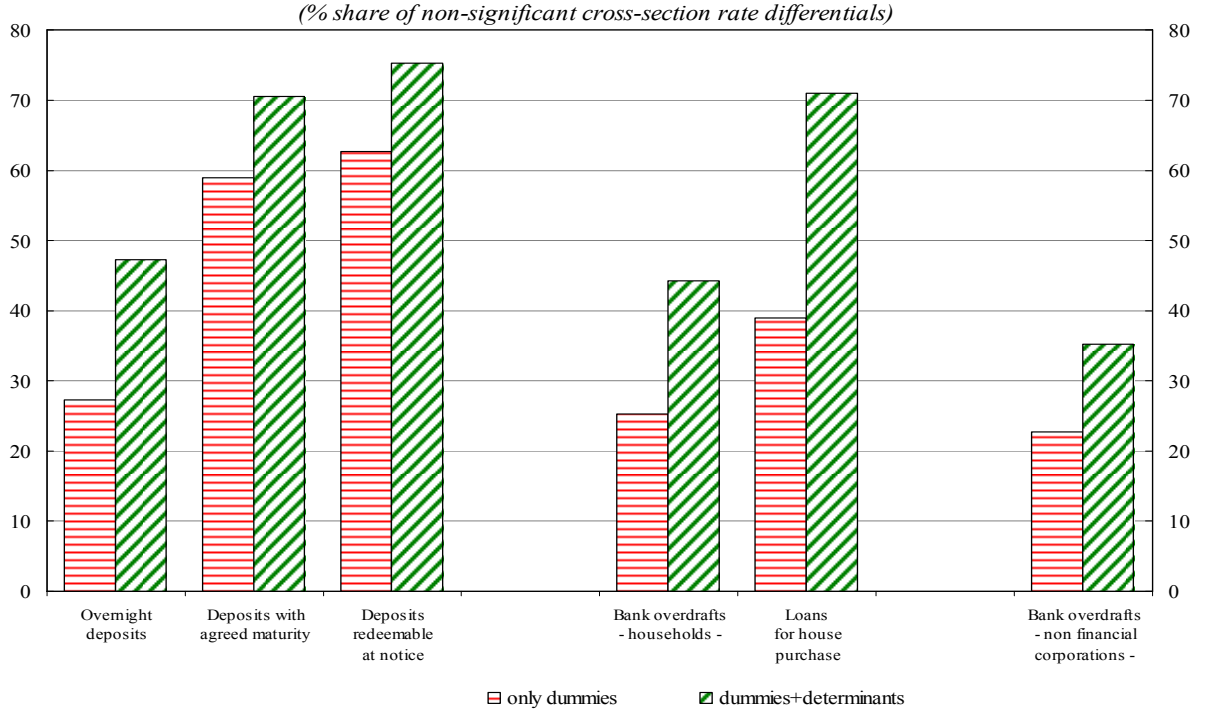
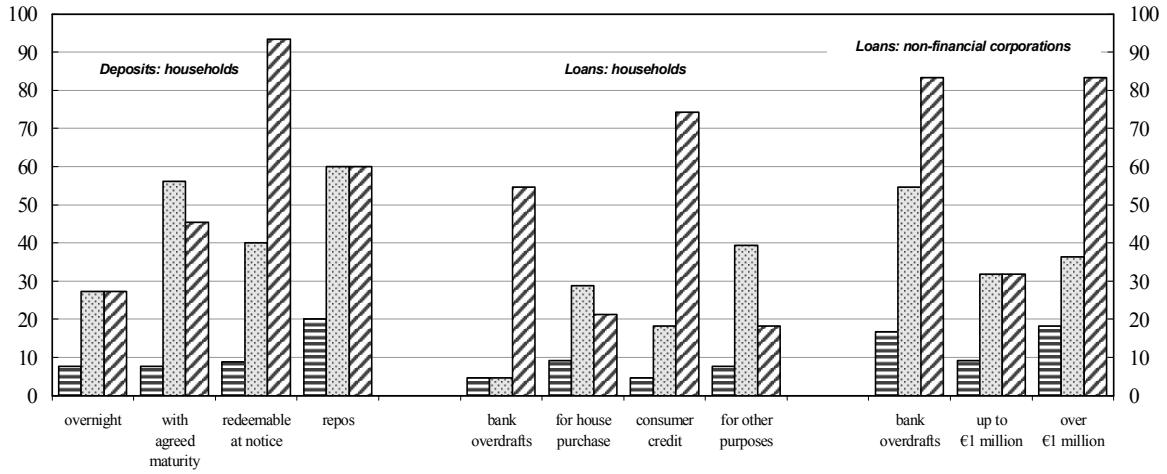
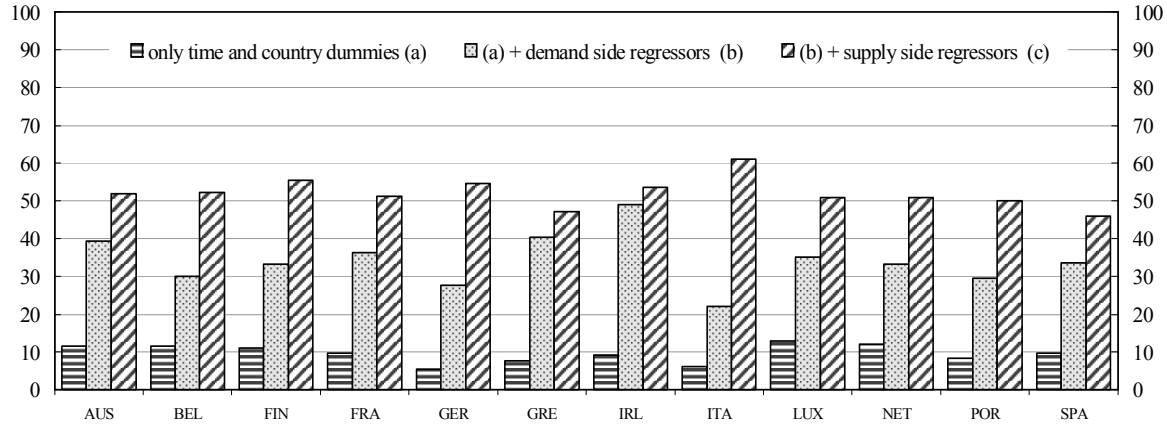


Figure 9

PERCENTAGE SHARES
OF STATISTICALLY SIMILAR BILATERAL DIFFERENTIALS
IN EURO AREA BANK INTEREST RATES





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 (CSEF), Department of Economics and Statistics, University of Salerno.

Affinito M., R. De Bonis and F. Farabullini (2004), "Financial Structures and Banks in Europe: an Overview ", Banca d'Italia, mimeo.

Angelini P., P. Di Salvo and G. Ferri (1998), "Availability and Cost of Credit for Small Business: Customer Relationships and Credit Cooperatives", *Journal of Banking and Finance*, 22, 6-8.

Angeloni I., A. Kashyap and B. Mojon (2003) (eds.), *Monetary Policy Transmission in the Euro Area*, Cambridge University Press, Cambridge.

Angeloni I., L. Buttiglione, G. Ferri and E. Gaiotti (1995), "The Credit Channel of Monetary Policy across Heterogeneous Banks: the Case of Italy", Banca d'Italia, *Temi di discussione*, 256.

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

Banca d'Italia (1996), "Dati territoriali sul credito e sui tassi di interesse bancari", Economic Bulletin, February.

Banca d'Italia (2003), "The New Harmonized Statistics on Bank Interest Rates", Economic Bulletin, 37.

Banco de España (2004), "A Comparison between Bank Rates in Spain and in the Euro Area" Economic Bulletin, April.

Bartiloro L. and R. De Bonis (2004), "The Financial Systems of European Countries: Theoretical Issues and Empirical Evidence", Banca d'Italia, mimeo.

Battipaglia P. and F. Bolognesi (2003), *L'armonizzazione delle statistiche europee sui tassi di interesse bancari e le scelte metodologiche italiane*, Banca d'Italia, Supplementi al Bollettino Statistico, Note metodologiche e informazioni statistiche, n. 57.

Belaisch A., L. Kodres, J. Levy and A. Ubide (2001), *Euro-Area Banking at the Crossroads*, IMF Working Paper, March.

Bell W.R., Dickey D.A. and R.B. Miller (1985), "Unit roots in time series models: tests and implications", *Technical Report n. 757, University of Wisconsin*, February.

Berger A.N. and G. Udell (1992), "Some Evidence on the Empirical Significance of Credit Rationing", *Journal of Political Economy*, 100.

Berger A.N. and T.H. Hannan (1989), "The Price-Concentration Relationship in Banking", *The Review of Economics and Statistics*, 71.

Berlin M. and L.J. Mester (1999), "Deposits and Relationship Lending", *Review of Financial Studies*, 12, 3-Fall.

Bernanke B. and A. Blinder (1988), "Is it Money or Credit, or Both or Neither? Credit, Money and Aggregate Demand", *American Economic Review*, 78-2.

Bernanke B. and M. Gertler (1995), "Inside the Black Box: the Credit Channel of Monetary Policy Transmission", *Journal of Economic Perspectives*, n. 9-4.

Bodenhorn H. (1995), "A More Perfect Union: Regional Interest Rates in the United States, 1880-1960", in M.D. Bordo and R. Sylla (eds), *Anglo-American Financial Systems-Institutions and Markets in the Twentieth Century*, New York University Salomon Center.

Boot A. (2000), "Relationship Banking: What do We Know?", *Journal of Financial Intermediation*, 9.

Busetti F., L. Forni, A. Harvey and F. Venditti (2004), "Inflation Convergence and Divergence within the European Monetary Union", mimeo.

Calcagnini G., F. Farabullini and D. Hester (2004), "Financial Convergence in the European Monetary Union?", in M. Guderzo and M. Napolitano (eds.), *Diplomazia delle risorse*.

Cecchetti S. (1999), "Legal Structure, Financial Structure, and the Monetary Policy Transmission Mechanism", *NBER Working Paper*, 7151.

Cottarelli C., G. Ferri and A. Generale (1995), "Bank Lending Rates and Financial Structure in Italy: a Case Study", *IMF Working Paper*, 38.

Danthine J. P., F. Giavazzi and E.L. von Thadden (2000), *European Financial Markets after EMU: a First Assessment*, CEPR Discussion Paper, 2413.

De Bandt O. (2000), *EMU and the Structure of the European Banking System*, in M. Artis, A. Weber and E. Hennessy (eds.), *The Euro A Challenge and Opportunity for Financial Markets*, Routledge International Studies in Money and Banking.

De Bonis R. and A. Ferrando (1997), "Da che cosa dipendono i tassi di interesse sui prestiti nelle province?", Banca d'Italia, *Temi di Discussione*, 319.

Demsetz H. (1973), "Industry Structure, Market Rivalry and Public Policy", *Journal of Law and Economics*, 16-1.

Dermine J. (2000), *Eurobanking*, in M. Artis, A. Weber and E. Hennessy (eds.), *The Euro A Challenge and Opportunity for Financial Markets*, Routledge International Studies in Money and Banking.

Dermine J. (2003), *Banking in Europe: Past, Present and Future*, in Vítor Gaspar, Philipp Hartmann and Olaf Sleijpen (eds.), *The Transformation of the European Financial System*, European Central Bank, Frankfurt.

Diamond D. (1991), "Monitoring and Reputation: the Choice between Bank Loans and Directly Placed Debt", *Journal of Political Economy*, 99.

ECB (1999a), *Possible Effects of EMU on the EU Banking Systems in the Medium to Long Term*, February, Frankfurt.

ECB (1999b), "Banking in the Euro Area: Structural Features and Trends", *Monthly Bulletin*, April.

ECB (2002), "Price Level Convergence and Competition in the Euro Area", *Monthly Bulletin*, August.

ECB (2003), *Manual on MFI Interest Rate Statistics – Regulation ECB/2001/18*, Frankfurt am Main.

Ehrmann, M., L. Gambacorta, J. Martinez Pagés, P. Sevestre and A. Worms (2001), "Financial Systems and the Role of Banks in Monetary Policy Transmission in the Euro Area", Banca d'Italia, *Temi di discussione*, 432.

Ehrmann, M., L. Gambacorta, J. Martinez Pagés, P. Sevestre and A. Worms (2003), "The Effects of Monetary Policy in the Euro Area", *Oxford Review of Economic Policy*, 19, 1.

Eichengreen B. (1984), "Mortgage Interest Rates in the Populist Era", *America Economic Review*, 74-5.

Favero C.A., F. Giavazzi and L. Fabbi (1999), "The Transmission Mechanism of Monetary Policy in Europe: Evidence from Banks' Balance Sheets'", *NBER Working Paper*, 7231.

Focarelli D. and F. Panetta (2003), "Are Merger Beneficial to Consumers? Evidence from the Market for Bank Deposits", *American Economic Review.*

Fried J. and P. Howitt (1980), "Credit Rationing and Implicit Contract Theory", *Journal of Money, Credit and Banking*, 12.

Friedman B. and K. Kuttner (1993), "Economic Activity and the Short-Term Credits Markets: an Analysis of Prices and Quantities", *Booking Papers on Economic Activity*, 2.

Gambacorta L. (2001), "Bank Specific Characteristics and Monetary Policy Transmission: the Case of Italy", *ECB Working Paper*, 103.

Gambacorta L. (2003), "The Italian Banking System and Monetary Policy Transmission: Evidence from Bank Level Data", in Angeloni *et al.* (2003).

Gambacorta L. (2005), "How do Banks Set Interest Rates?", Banca d'Italia, *Temi di discussione*, 542.

Hannan T.H. and R.A. Prager (2004), "Multimarket Bank Pricing: an Empirical Investigation of Deposit Interest Rates", Board of Governors of the Federal Reserve System, mimeo.

Harvey A.C. and V. Carvalho (2002), "Models for converging economies", *University of Cambridge – DAE Working Papers*.

Hobjin B. and P.H. Franses (2000), "Asymptotically perfect and relative convergence productivity", *Journal of Applied Econometrics*, 15.

Holmström B. and J. Tirole (1997), "Financial Intermediation, Loanable Funds, and the Real Sector", *Quarterly Journal of Economics*, 112 – 3.

Jackson W.E. (1992), "Is the Market Well Defined in Bang Merger and Acquisition Analysis?", *Review of Economics and Statistics*, 74-4.

Kashyap A.K. and J.C. Stein (1995), "The Impact of Monetary Policy on Bank Balance Sheets", *Carnegie Rochester Conference Series on Public Policy*, 42.

Kashyap A.K., J.C. Stein and Wilcox (1995), "Monetary Policy and Credit Conditions: Evidence from the Composition of Extreme Finance", *America Economic Review*, 83-1.

Kashyap A.K. and J.C. Stein (2000), "What do a Million Observations on Banks Say about the Transmission of Monetary Policy", *American Economic Review*, 90.

Kishan R.P. and T.P. Opiela (2000), "Bank Size, Bank Capital and Bank Lending Channel", *Journal of Money, Credit and Banking*, 32, 1.

Klein M. (1971), "A Theory of the Bank Firm", *Journal of Money, Credit, and Banking,* 3.

Kwiatkowski D., P.C.B. Phillips, P. Schmidt and Y. Shin (1992), "Testing the Null Hypothesis of Stationarity against the Alternative of a Unit Root: how Sure are we that Economic Time Series have a Unit Root?", *Journal of Econometrics*, 44.

Levy A. and F. Panetta (1993), "I tassi di interesse reali: l'esperienza dell'ultimo trentennio", in P. Ciocca and G. Nardozzi (1993), *L'alto prezzo del danaro*, Laterza, Roma-Bari.

Lummer S. and L. McConnell (1989), "Further Evidence on the Bank Lending Process and the Capital Market Response to Bank Loan Announcements", *Journal of Financial Economics*, 25.

Manna M. (2004), "Developing Statistical Indicators of the Integration of the Euro Area Banking System", *ECB Working Paper Series*, 300.

Monti M. (1972), "Deposit, Credit and Interest Rate Determination under Alternative Bank Objectives", in G.P. Szego and K. Shell, *Mathematical Methods in Investment and Finance*, North-Holland, Amsterdam. Moore, Porter e Small, 1990.

Padoa-Schioppa (2000), "Is a Euroland Banking System Already Emerging?", *Société Universitaire Européenne de Recherces Financières*, Vienna.

Petersen M. and R. Rajan (1994), "The Benefits of Lending Relationships: Evidence from Small Business Data", *Journal of Finance*, 49.

Sander H. and S. Kleimeier (2001), "Towards a Single Retail Banking Market? New Evidence from Euroland", mimeo.

Stigler G.J. and R.A. Sherwin (1985), "The Extent of the Market", *Journal of Law and Economics*, 28-3.

Stiglitz J. and A. Weiss (1981), "Credit Rationing in Markets with Imperfect Information", *American Economic Review*, 71 – 3.

Thakor A.V. (1996), "Capital Requirements, Monetary Policy, and Aggregate Bank Lending: Theory and Empirical Evidence", *Journal of Finance*, 51.

Trichet J.-C. (2006), "The Process of European Financial Integration: Where do We Stand?", Campus for Finance 2006, WHU Otto Beisheim School of Management, Vallendar 13 January.

RECENTLY PUBLISHED "TEMI" (*).

N. 564 – *Technology transfer and economic growth in developing countries: an economic analysis*, by V. Crispolti and D. Marconi (November 2005).

N. 565 – *La ricchezza finanziaria nei conti finanziari e nell'indagine sui bilanci delle famiglie italiane*, by R. Bonci, G. Marchese and A. Neri (November 2005).

N. 566 – *Are there asymmetries in the response of bank interest rates to monetary shocks?*, by L. Gambacorta and S. Iannotti (November 2005).

N. 567 – *Un'analisi quantitativa dei meccanismi di riequilibrio del disavanzo esterno degli Stati Uniti*, by F. Paternò (November 2005).

N. 568 – *Evolution of trade patterns in the new EU member States,* by A. Zaghini (November 2005).

N. 569 – *The private and social return to schooling in Italy,* by A. Ciccone, F. Cingano and P. Cipollone (January 2006).

N. 570 – *Is there an urban wage premium in Italy?,* by S. Di Addario and E. Patacchini (January 2006).

N. 571 – *Production or consumption? Disentangling the skill-agglomeration Connection,* by Guido de Blasio (January 2006).

N. 572 – *Incentives in universal banks,* by Ugo Albertazzi (January 2006).

N. 573 – *Le rimesse dei lavoratori emigrati e le crisi di conto corrente,* by M. Bugamelli and F. Paternò (January 2006).

N. 574 – *Debt maturity of Italian firms,* by Silvia Magri (January 2006).

N. 575 – *Convergence of prices and rates of inflation,* by F. Busetti, S. Fabiani and A. Harvey (February 2006).

N. 576 – *Stock market fluctuations and money demand in Italy, 1913-2003,* by Massimo Caruso (February 2006).

N. 577 – *Skill dispersion and firm productivity: an analysis with employer-employee matched data,* by S. Iranzo, F. Schivardi and E. Tosetti (February 2006).

N. 578 – *Produttività e concorrenza estera,* by M. Bugamelli and A. Rosolia (February 2006).

N. 579 – *Is foreign exchange intervention effective? Some micro-analytical evidence from the Czech Republic,* by Antonio Scalia (February 2006).

N. 580 – *Canonical term-structure models with observable factors and the dynamics of bond risk premiums*, by M. Pericoli and M. Taboga (February 2006).

N. 581 – *Did inflation really soar after the euro cash changeover? Indirect evidence from ATM withdrawals,* by P. Angelini and F. Lippi (March 2006).

N. 582 – *Qual è l'effetto degli incentivi agli investimenti? Una valutazione della legge 488/92*, by R. Bronzini and G. de Blasio (March 2006).

N. 583 – *The value of flexible contracts: evidence from an Italian panel of industrial firms,* by P. Cipollone and A. Guelfi (March 2006).

N. 584 – *The causes and consequences of venture capital financing. An analysis based on a sample of Italian firms*, by D. M. Del Colle, P. Finaldi Russo and A. Generale (March 2006).

N. 585 – *Risk-adjusted forecasts of oil prices*, by P. Pagano and M. Pisani (March 2006).

N. 586 – *The CAPM and the risk appetite index: theoretical differences and empirical similarities*, by M. Pericoli and M. Sbracia (March 2006).

N. 587 – *Efficiency vs. agency motivations for bank takeovers: some empirical evidence*, by A. De Vincenzo, C. Doria and C. Salleo (May 2006).

N. 588 – *A multinomial approach to early warning system for debt crises*, by A. Ciarlone and G. Trebeschi (May 2006).

(*) Requests for copies should be sent to:
Banca d'Italia – Servizio Studi – Divisione Biblioteca e pubblicazioni – Via Nazionale, 91 – 00184 Rome (fax 0039 06 47922059). They are available on the Internet www.bancaditalia.it.

1999

L. GUISO and G. PARIGI, *Investment and demand uncertainty*, Quarterly Journal of Economics, Vol. 114 (1), pp. 185-228, **TD No. 289 (November 1996)**.

A. F. POZZOLO, *Gli effetti della liberalizzazione valutaria sulle transazioni finanziarie dell'Italia con l'estero*, Rivista di Politica Economica, Vol. 89 (3), pp. 45-76, **TD No. 296 (February 1997)**.

A. CUKIERMAN and F. LIPPI, *Central bank independence, centralization of wage bargaining, inflation and unemployment: theory and evidence*, European Economic Review, Vol. 43 (7), pp. 1395-1434, **TD No. 332 (April 1998)**.

P. CASELLI and R. RINALDI, *La politica fiscale nei paesi dell'Unione europea negli anni novanta,* Studi e note di economia, (1), pp. 71-109, **TD No. 334 (July 1998)**.

A. BRANDOLINI, *The distribution of personal income in post-war Italy: Source description, data quality, and the time pattern of income inequality*, Giornale degli economisti e Annali di economia, Vol. 58 (2), pp. 183-239, **TD No. 350 (April 1999)**.

L. GUISO, A. K. KASHYAP, F. PANETTA and D. TERLIZZESE, *Will a common European monetary policy have asymmetric effects?*, Economic Perspectives, Federal Reserve Bank of Chicago, Vol. 23 (4), pp. 56-75, **TD No. 384 (October 2000)**.

2000

P. ANGELINI, *Are banks risk-averse? Timing of the operations in the interbank market*, Journal of Money, Credit and Banking, Vol. 32 (1), pp. 54-73, **TD No. 266 (April 1996).**

F. DRUDI and R. GIORDANO, *Default Risk and optimal debt management,* Journal of Banking and Finance, Vol. 24 (6), pp. 861-892, **TD No. 278 (September 1996)**.

F. DRUDI and R. GIORDANO, *Wage indexation, employment and inflation,* Scandinavian Journal of Economics, Vol. 102 (4), pp. 645-668, **TD No. 292 (December 1996)**.

F. DRUDI and A. PRATI, *Signaling fiscal regime sustainability,* European Economic Review, Vol. 44 (10), pp. 1897-1930, **TD No. 335 (September 1998)**.

F. FORNARI and R. VIOLI, *The probability density function of interest rates implied in the price of options,* in: R. Violi, (ed.) , Mercati dei derivati, controllo monetario e stabilità finanziaria, Il Mulino, Bologna, **TD No. 339 (October 1998)**.

D. J. MARCHETTI and G. PARIGI, *Energy consumption, survey data and the prediction of industrial production in Italy,* Journal of Forecasting, Vol. 19 (5), pp. 419-440, **TD No. 342 (December 1998)**.

A. BAFFIGI, M. PAGNINI and F. QUINTILIANI, *Localismo bancario e distretti industriali: assetto dei mercati del credito e finanziamento degli investimenti,* in: L.F. Signorini (ed.), Lo sviluppo locale: un'indagine della Banca d'Italia sui distretti industriali, Donzelli, **TD No. 347** (**March 1999)**.

A. SCALIA and V. VACCA, *Does market transparency matter? A case study*, in: Market Liquidity: Research Findings and Selected Policy Implications*,* Basel, Bank for International Settlements, **TD No. 359 (October 1999)**.

F. SCHIVARDI, *Rigidità nel mercato del lavoro, disoccupazione e crescita*, Giornale degli economisti e Annali di economia, Vol. 59 (1), pp. 117-143, **TD No. 364 (December 1999)**.

G. BODO, R. GOLINELLI and G. PARIGI, *Forecasting industrial production in the euro area,* Empirical Economics, Vol. 25 (4), pp. 541-561, **TD No. 370 (March 2000)**.

F. ALTISSIMO, D. J. MARCHETTI and G. P. ONETO, *The Italian business cycle: Coincident and leading indicators and some stylized facts,* Giornale degli economisti e Annali di economia, Vol. 60 (2), pp. 147-220, **TD No. 377 (October 2000)**.

C. MICHELACCI and P. ZAFFARONI, *(Fractional) Beta convergence*, Journal of Monetary Economics, Vol. 45, pp. 129-153, **TD No. 383 (October 2000)**.

R. DE BONIS and A. FERRANDO*, The Italian banking structure in the nineties: testing the multimarket contact hypothesis*, Economic Notes, Vol. 29 (2), pp. 215-241, **TD No. 387 (October 2000)**.

2001

M. CARUSO, *Stock prices and money velocity: A multi-country analysis,* Empirical Economics, Vol. 26 (4), pp. 651-72, **TD No. 264 (February 1996)**.

P. CIPOLLONE and D. J. MARCHETTI, *Bottlenecks and limits to growth: A multisectoral analysis of Italian industry*, Journal of Policy Modeling, Vol. 23 (6), pp. 601-620, **TD No. 314 (August 1997)**.

P. CASELLI, *Fiscal consolidations under fixed exchange rates,* European Economic Review, Vol. 45 (3), pp. 425-450, **TD No. 336 (October 1998)**.

F. ALTISSIMO and G. L. VIOLANTE, *Nonlinear VAR: Some theory and an application to US GNP and unemployment,* Journal of Applied Econometrics, Vol. 16 (4), pp. 461-486, **TD No. 338 (October 1998)**.

F. NUCCI and A. F. POZZOLO, *Investment and the exchange rate*, European Economic Review, Vol. 45 (2), pp. 259-283, **TD No. 344 (December 1998)**.

L. GAMBACORTA, *On the institutional design of the European monetary union: Conservatism, stability pact and economic shocks,* Economic Notes, Vol. 30 (1), pp. 109-143, **TD No. 356 (June 1999)**.

P. FINALDI RUSSO and P. ROSSI, *Credit costraints in italian industrial districts,* Applied Economics, Vol. 33 (11), pp. 1469-1477, **TD No. 360 (December 1999)**.

A. CUKIERMAN and F. LIPPI, *Labor markets and monetary union: A strategic analysis,* Economic Journal, Vol. 111 (473), pp. 541-565, **TD No. 365 (February 2000)**.

G. PARIGI and S. SIVIERO, *An investment-function-based measure of capacity utilisation, potential output and utilised capacity in the Bank of Italy's quarterly model*, Economic Modelling, Vol. 18 (4), pp. 525-550, **TD No. 367 (February 2000)**.

F. BALASSONE and D. MONACELLI, *Emu fiscal rules: Is there a gap?,* in: M. Bordignon and D. Da Empoli (eds.), Politica fiscale, flessibilità dei mercati e crescita*,* Milano*,* Franco Angeli, **TD No. 375 (July 2000)**.

A. B. ATKINSON and A. BRANDOLINI, *Promise and pitfalls in the use of "secondary" data-sets: Income inequality in OECD countries*, Journal of Economic Literature, Vol. 39 (3), pp. 771-799, **TD No. 379 (October 2000)**.

D. FOCARELLI and A. F. POZZOLO, *The determinants of cross-border bank shareholdings: An analysis with bank-level data from OECD countries*, Journal of Banking and Finance, Vol. 25 (12), pp. 2305-2337, **TD No. 381 (October 2000)**.

M. SBRACIA and A. ZAGHINI, *Expectations and information in second generation currency crises models*, Economic Modelling, Vol. 18 (2), pp. 203-222, **TD No. 391 (December 2000)**.

F. FORNARI and A. MELE, *Recovering the probability density function of asset prices using GARCH as diffusion approximations,* Journal of Empirical Finance, Vol. 8 (1), pp. 83-110**, TD No. 396 (February 2001)**.

P. CIPOLLONE, *La convergenza dei salari manifatturieri in Europa,* Politica economica, Vol. 17 (1), pp. 97-125, **TD No. 398 (February 2001)**.

E. BONACCORSI DI PATTI and G. GOBBI, *The changing structure of local credit markets: Are small businesses special?*, Journal of Banking and Finance, Vol. 25 (12), pp. 2209-2237, **TD No. 404 (June 2001)**.

CORSETTI G., PERICOLI M., SBRACIA M., *Some contagion, some interdependence: more pitfalls in tests of financial contagion,* Journal of International Money and Finance, 24, 1177-1199, **TD No. 408 (June 2001)**.

G. MESSINA, *Decentramento fiscale e perequazione regionale. Efficienza e redistribuzione nel nuovo sistema di finanziamento delle regioni a statuto ordinario*, Studi economici, Vol. 56 (73), pp. 131-148, **TD No. 416 (August 2001)**.

2002

R. CESARI and F. PANETTA, *Style, fees and performance of Italian equity funds*, Journal of Banking and Finance, Vol. 26 (1), **TD No. 325 (January 1998)**.

L. GAMBACORTA, *Asymmetric bank lending channels and ECB monetary policy*, Economic Modelling, Vol. 20 (1), pp. 25-46, **TD No. 340 (October 1998)**.

C. GIANNINI, *"Enemy of none but a common friend of all"? An international perspective on the lender-of-last-resort function*, Essay in International Finance, Vol. 214, Princeton, N. J., Princeton University Press, **TD No. 341 (December 1998)**.

A. ZAGHINI, *Fiscal adjustments and economic performing: A comparative study*, Applied Economics, Vol. 33 (5), pp. 613-624, **TD No. 355 (June 1999)**.

F. ALTISSIMO, S. SIVIERO and D. TERLIZZESE, *How deep are the deep parameters?,* Annales d'Economie et de Statistique,.(67/68), pp. 207-226, **TD No. 354 (June 1999)**.

F. FORNARI, C. MONTICELLI, M. PERICOLI and M. TIVEGNA, *The impact of news on the exchange rate of the lira and long-term interest rates,* Economic Modelling, Vol. 19 (4), pp. 611-639, **TD No. 358 (October 1999**).

D. FOCARELLI, F. PANETTA and C. SALLEO, *Why do banks merge?,* Journal of Money, Credit and Banking, Vol. 34 (4), pp. 1047-1066, **TD No. 361 (December 1999)**.

D. J. MARCHETTI, *Markup and the business cycle: Evidence from Italian manufacturing branches,* Open Economies Review, Vol. 13 (1), pp. 87-103, **TD No. 362 (December 1999**).

F. BUSETTI, *Testing for stochastic trends in series with structural breaks*, Journal of Forecasting, Vol. 21 (2), pp. 81-105, **TD No. 385 (October 2000)**.

F. LIPPI, *Revisiting the Case for a Populist Central Banker,* European Economic Review*,* Vol. 46 (3), pp. 601-612, **TD No. 386 (October 2000)**.

F. PANETTA, *The stability of the relation between the stock market and macroeconomic forces*, Economic Notes, Vol. 31 (3), **TD No. 393 (February 2001)**.

G. GRANDE and L. VENTURA, *Labor income and risky assets under market incompleteness: Evidence from Italian data,* Journal of Banking and Finance, Vol. 26 (2-3), pp. 597-620, **TD No. 399 (March 2001)**.

A. BRANDOLINI, P. CIPOLLONE and P. SESTITO, *Earnings dispersion, low pay and household poverty in Italy, 1977-1998,* in D. Cohen, T. Piketty and G. Saint-Paul (eds.), The Economics of Rising Inequalities, pp. 225-264, Oxford, Oxford University Press, **TD No. 427 (November 2001)**.

L. CANNARI and G. D'ALESSIO, *La distribuzione del reddito e della ricchezza nelle regioni italiane*, Rivista Economica del Mezzogiorno (Trimestrale della SVIMEZ), Vol. XVI (4), pp. 809-847, Il Mulino, **TD No. 482 (June 2003)**.

2003

F. SCHIVARDI, *Reallocation and learning over the business cycle,* European Economic Review, , Vol. 47 (1), pp. 95-111, **TD No. 345 (December 1998)**.

P. CASELLI, P. PAGANO and F. SCHIVARDI, *Uncertainty and slowdown of capital accumulation in Europe*, Applied Economics, Vol. 35 (1), pp. 79-89, **TD No. 372 (March 2000).**

P. ANGELINI and N. CETORELLI*, The effect of regulatory reform on competition in the banking industry,* Federal Reserve Bank of Chicago, Journal of Money, Credit and Banking, Vol. 35, pp. 663-684, **TD No. 380 (October 2000)**.

P. PAGANO and G. FERRAGUTO, Endogenous growth with intertemporally dependent preferences, Contribution to Macroeconomics, Vol. 3 (1), pp. 1-38, **TD No. 382 (October 2000).**

P. PAGANO and F. SCHIVARDI, *Firm size distribution and growth,* Scandinavian Journal of Economics, Vol. 105 (2), pp. 255-274, **TD No. 394 (February 2001)**.

M. PERICOLI and M. SBRACIA, *A Primer on Financial Contagion,* Journal of Economic Surveys, Vol. 17 (4), pp. 571-608, **TD No. 407 (June 2001)**.

M. SBRACIA and A. ZAGHINI, *The role of the banking system in the international transmission of shocks,* World Economy, Vol. 26 (5), pp. 727-754, **TD No. 409 (June 2001)**.

E. GAIOTTI and A. GENERALE, *Does monetary policy have asymmetric effects? A look at the investment decisions of Italian firms,* Giornale degli Economisti e Annali di Economia, Vol. 61 (1), pp. 29-59, **TD No. 429 (December 2001)**.

L. GAMBACORTA, *The Italian banking system and monetary policy transmission: evidence from bank level data*, in: I. Angeloni, A. Kashyap and B. Mojon (eds.), Monetary Policy Transmission in the Euro Area, Cambridge, Cambridge University Press, **TD No. 430 (December 2001).**

M. EHRMANN, L. GAMBACORTA, J. MARTÍNEZ PAGÉS, P. SEVESTRE and A. WORMS, *Financial systems and the role of banks in monetary policy transmission in the euro area,* in: I. Angeloni, A. Kashyap and B. Mojon (eds.), Monetary Policy Transmission in the Euro Area, Cambridge, Cambridge University Press, **TD No. 432 (December 2001)**.

F. SPADAFORA, *Financial crises, moral hazard and the speciality of the international market: further evidence from the pricing of syndicated bank loans to emerging markets*, Emerging Markets Review, Vol. 4 (2), pp. 167-198, **TD No. 438 (March 2002)**.

D. FOCARELLI and F. PANETTA, *Are mergers beneficial to consumers? Evidence from the market for bank deposits*, American Economic Review, Vol. 93 (4), pp. 1152-1172, **TD No. 448 (July 2002)**.

E.VIVIANO, *Un'analisi critica delle definizioni di disoccupazione e partecipazione in Italia,* Politica Economica, Vol. 19 (1), pp. 161-190, **TD No. 450 (July 2002)**.

M. PAGNINI, *Misura e Determinanti dell'Agglomerazione Spaziale nei Comparti Industriali in Italia*, Rivista di Politica Economica, Vol. 3 (4), pp. 149-196, **TD No. 452 (October 2002)**.

F. BUSETTI and A. M. ROBERT TAYLOR, *Testing against stochastic trend and seasonality in the presence of unattended breaks and unit roots*, Journal of Econometrics, Vol. 117 (1), pp. 21-53, **TD No. 470 (February 2003)**.

2004

F. LIPPI, *Strategic monetary policy with non-atomistic wage-setters,* Review of Economic Studies, Vol. 70 (4), pp. 909-919, **TD No. 374 (June 2000)**.

P. CHIADES and L. GAMBACORTA, *The Bernanke and Blinder model in an open economy: The Italian case,* German Economic Review, Vol. 5 (1), pp. 1-34, **TD No. 388 (December 2000)**.

M. BUGAMELLI and P. PAGANO, *Barriers to Investment in ICT*, Applied Economics, Vol. 36 (20), pp. 2275-2286, **TD No. 420 (October 2001)**.

A. BAFFIGI, R. GOLINELLI and G. PARIGI, *Bridge models to forecast the euro area GDP*, International Journal of Forecasting, Vol. 20 (3), pp. 447-460,**TD No. 456 (December 2002)**.

D. AMEL, C. BARNES, F. PANETTA and C. SALLEO, *Consolidation and Efficiency in the Financial Sector: A Review of the International Evidence*, Journal of Banking and Finance, Vol. 28 (10), pp. 2493-2519, **TD No. 464 (December 2002).**

M. PAIELLA, *Heterogeneity in financial market participation: appraising its implications for the C-CAPM*, Review of Finance, Vol. 8, pp. 1-36, **TD No. 473 (June 2003)**.

E. BARUCCI, C. IMPENNA and R. RENÒ, *Monetary integration, markets and regulation*, Research in Banking and Finance, (4), pp. 319-360, **TD No. 475 (June 2003)**.

G. ARDIZZI, *Cost efficiency in the retail payment networks: first evidence from the Italian credit card system*, Rivista di Politica Economica, Vol. 94, (3), pp. 51-82, **TD No. 480 (June 2003)**.

E. BONACCORSI DI PATTI and G. DELL'ARICCIA, *Bank competition and firm creation*, Journal of Money Credit and Banking, Vol. 36 (2), pp. 225-251, **TD No. 481 (June 2003)**.

R. GOLINELLI and G. PARIGI, *Consumer sentiment and economic activity: a cross country comparison*, Journal of Business Cycle Measurement and Analysis, Vol. 1 (2), pp. 147-172, **TD No. 484 (September 2003)**.

L. GAMBACORTA and P. E. MISTRULLI, *Does bank capital affect lending behavior?*, Journal of Financial Intermediation, Vol. 13 (4), pp. 436-457, **TD No. 486 (September 2003)**.

G. GOBBI and F. LOTTI, *Entry decisions and adverse selection: an empirical analysis of local credit markets,* Journal of Financial services Research, Vol. 26 (3), pp. 225-244, **TD No. 535 (December 2004)**.

F. CINGANO and F. SCHIVARDI, *Identifying the sources of local productivity growth,* Journal of the European Economic Association, Vol. 2 (4), pp. 720-742, **TD No. 474 (June 2003)**.

C. BENTIVOGLI and F. QUINTILIANI, *Tecnologia e dinamica dei vantaggi comparati: un confronto fra quattro regioni italiane*, in C. Conigliani (a cura di), *Tra sviluppo e stagnazione: l'economia dell'Emilia-Romagna*, Bologna, Il Mulino, **TD No. 522 (October 2004)**.

E. GAIOTTI and F. LIPPI, *Pricing behavior and the introduction of the euro:evidence from a panel of restaurants*, Giornale degli Economisti e Annali di Economia, 2004, Vol. 63(3/4):491-526, **TD No. 541 (February 2005)**.

2005

L. DEDOLA and F. LIPPI, *The monetary transmission mechanism: evidence from the industries of 5 OECD countries,* European Economic Review, 2005, Vol. 49(6): 1543-69, **TD No. 389 (December 2000)**.

G. DE BLASIO and S. DI ADDARIO, *Do workers benefit from industrial agglomeration?* Journal of regional Science, Vol. 45 n.4, pp. 797-827, **TD No. 453 (October 2002).**

M. OMICCIOLI, *Il credito commerciale: problemi e teorie,* in L. Cannari, S. Chiri e M. Omiccioli (a cura di), *Imprese o intermediari? Aspetti finanziari e commerciali del credito tra imprese in Italia*, Bologna, Il Mulino, **TD No. 494 (June 2004)**.

L. CANNARI, S. CHIRI and M. OMICCIOLI, *Condizioni del credito commerciale e differenzizione della clientela,* in L. Cannari, S. Chiri e M. Omiccioli (a cura di), *Imprese o intermediari? Aspetti finanziari e commerciali del credito tra imprese in Italia*, Bologna, Il Mulino, **TD No. 495 (June 2004)**.

P. FINALDI RUSSO and L. LEVA, *Il debito commerciale in Italia: quanto contano le motivazioni finanziarie?,* in L. Cannari, S. Chiri e M. Omiccioli (a cura di), *Imprese o intermediari? Aspetti finanziari e commerciali del credito tra imprese in Italia*, Bologna, Il Mulino, **TD No. 496 (June 2004)**.

A. CARMIGNANI, *Funzionamento della giustizia civile e struttura finanziaria delle imprese: il ruolo del credito commerciale,* in L. Cannari, S. Chiri e M. Omiccioli (a cura di), *Imprese o intermediari? Aspetti finanziari e commerciali del credito tra imprese in Italia*, Bologna, Il Mulino, **TD No. 497 (June 2004)**.

G. DE BLASIO, *Credito commerciale e politica monetaria: una verifica basata sull'investimento in scorte,* in L. Cannari, S. Chiri e M. Omiccioli (a cura di), *Imprese o intermediari? Aspetti finanziari e commerciali del credito tra imprese in Italia*, Bologna, Il Mulino, **TD No. 498 (June 2004)**.

G. DE BLASIO, *Does trade credit substitute bank credit? Evidence from firm-level data.* Economic notes, Vol. 34 n.1, pp. 85-112, **TD No. 498 (June 2004).**

A. DI CESARE, *Estimating Expectations of Shocks Using Option Prices,* The ICFAI Journal of Derivatives Markets, Vol. II (1), pp. 42-53, **TD No. 506 (July 2004).**

M. BENVENUTI and M. GALLO, P*erché le imprese ricorrono al factoring? Il caso dell'Italia,* in L. Cannari, S. Chiri e M. Omiccioli (a cura di), *Imprese o intermediari? Aspetti finanziari e commerciali del credito tra imprese in Italia*, Bologna, Il Mulino, **TD No. 518 (October 2004)**.

P. DEL GIOVANE and R. SABBATINI, *L'euro e l'inflazione. Percezioni, fatti e analisi,* Bologna, Il Mulino, **TD No. 532 (December 2004).**