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A NEW METRIC FOR BANKING INTEGRATION IN EUROPE

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ABSTRACT

Most observers have concluded that while money markets and government bond markets are rapidly integrating following the introduction of the common currency in the euro area, there is little evidence that a similar integration process is taking place for retail banking. Data on cross-border retail bank flows, cross-border bank mergers and the law of one price reveal no evidence of integration in retail banking. This paper shows that the previous tests of bank integration are weak in that they are not based on an equilibrium concept and are neither necessary nor sufficient statistics for bank integration. The paper proposes a new test of integration based on convergence in banks' profitability. The new test emphasises the role of an active market for corporate control and of competition in banking integration. European listed banks profitability appears to converge to a common level. There is weak evidence that competition eliminates high profits for these banks, and underperforming banks tend to show improved profitability. Unlisted European banks differ markedly. Their profits show no tendency to revert to a common target rate of profitability. Overall, the banking market in Europe appears far from being integrated. In contrast, in the U.S. both listed and unlisted commercial banks profits converge to the same target, and high profit banks see their profits driven down quickly.

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1. Introduction

In this paper we propose a new approach for assessing banking integration in Europe. The measurement of integration is of considerable policy relevance. For example, the European Central Bank mission statement reads: "We in the Eurosystem have as our primary objective the maintenance of price stability for the common good. Acting also as a leading financial authority, we aim to safeguard financial stability and *promote European financial integration*" (italics added). The ECB (2007) defines financial integration by saying "*The market for a given set of financial instruments or services to be fully integrated when all potential market participants in such a market (i) are subject to a single set of rules when they decide to deal with those financial instruments or services, (ii) have equal access to this set of financial instruments or services, and (iii) are treated equally when they operate in the market.*"

This definition has direct implications for how banking integration should be measured. For instance, the equal access condition presumes that it is profitable for all services to be offered in all markets. This is akin to requiring that if there is demand for a service it must be met everywhere within an economic area at the lowest cost at which it can be provided anywhere within that area. This seems a useful benchmark for bond or wholesale banking markets, but much less relevant for locally provided retail banking services. Unless bank cost structures are identical across local communities some services might not be offered in some locations. This is not informative about financial integration.

The equal treatment provision is also unusual because it includes no efficiency benchmark. As an extreme example, consider the case of a monopolist supplying financial services far above marginal cost. This would satisfy the ECB definition, but clearly would not be efficient and we doubt would be viewed as acceptable by policymakers.

The common problem highlighted by both these observations is that market conditions depend on both supply and demand. The ECB definition pays insufficient attention to the supply side of the market. Existing empirical work (as represented by Cabral et al., 2002; Baele et al., 2004; Adam et al., 2002, ECB 2008) also suffers to certain extent from the same criticism.

Previous research assessing integration has been of three varieties. One looks at the extent of cross-border direct retail operations of banks (Gual, 2004, Perez et al., 2005). These data are tracked by the Bank for International Settlements and suggest that while wholesale or money market flows across borders within the euro area are large, retail flows are generally

less than 1 percent of total lending. This is taken as evidence against retail banking integration, although most authors would concede that cross-border retail flows do not constitute a necessary condition for retail banking integration to take place. One could easily imagine a financial system in which we would observe a complete absence of cross-border retail flows, but which would be perfectly integrated. For example, the threat of such flows could be enough to ensure perfect integration.

A second indicator is cross-border bank mergers (see most recently Köhler (2007) and Köhler (2009), for evidence on this and a review of this literature). The absence of such deals, say in comparison to the number of domestic bank mergers, has also been taken as evidence against retail bank integration. Of course, similar arguments apply in this case as for cross-border retail flows and cross-border mergers are likely to be neither necessary, nor sufficient for financial integration to take place.

The third method for detecting integration comes from Adam et al.'s (2002) study of retail interest rates. They look at 5 year corporate loans and mortgage loans and find lending rates barely converge after 1999. In a partial adjustment model the speed of convergence is only 2% per year for corporate rates and 7% for mortgage rates. Based on this slow rate of convergence, they conclude that retail banking markets are far from integrated and do not seem to be on a path towards integration.

The ECB's annual Financial Integration Report (2008) reports extensive descriptive information, such as the cross-country standard deviation of interest rates on various bank products to argue that retail bank markets are not integrated. Affinito and Farabullini (2009) show that interest rate dispersion is reduced after controlling for variables reflecting the characteristics of domestic borrowers, such as risk exposure, disposable income, firm size, etc. They also demonstrate that price dispersion is larger across the euro area than across regions in Italy. They conclude that "euro area prices appear different because national banking products appear different or because they are differentiated by national factors". We argue that this same reasoning implies that interest rate dispersion is a poor guide to judging integration. Indeed, we will present examples that show that interest rate dispersion may be completely unrelated to banking integration.

The starting point for our analysis is a reconsideration of the relevance of the law of one price in this context. We argue that the law of one price in retail banking, the way it has been applied in the previous literature, constitutes neither a sufficient nor necessary condition for retail banking integration. The reason is the high degree of heterogeneity in demand for retail bank products that may arise from differences in tax systems, preferences, risk characteristics

or other demand side related factors (section 2). Once we admit that there are legitimate reasons why demand might differ across markets, then even with a single supply curve prices would differ. Yet, these price differences would not represent a failure of integration.

In section 3, we propose a new test of retail bank integration in the spirit of Stigler (1963) which we argue constitutes a sufficient condition for banking integration. Our notion of integration presumes new entry and takeovers will lead to a convergence in profitability. This way of looking at integration shifts the focus to looking at barriers to entry and takeovers and to comparisons of profit rates rather than prices of banking products. The remainder of the paper explores whether integration in this sense holds.

In section 4, we describe the data we use to carry the test of our condition. This sample consists of 36,000 observations on banks in France, Germany, Italy, Spain, the U.S and the U.K between 1994 and 2006. The sample includes listed and unlisted banks and also includes many savings and cooperative banks. We show that average profitability varies widely among bank types (listed, unlisted) in Europe, but not in the U.S. Further, even within listed and unlisted banks, profitability varies widely across countries in Europe.

In section 5, we estimate a partial adjustment model to assess convergence. The logic of our test suggests investigating whether profit rates converge and whether the tendency towards convergence depends on the strength of the market for corporate control. Hence publicly traded banks should be under different pressure than unlisted banks.

We find this to be the case. Listed banks in Europe and U.S. each show a tendency to revert to the average profit rates in their respective areas. The non-listed commercial banks in the U.S. that are unusually profitable tend to have these profits competed away – but underperforming non-traded banks do not seem to improve. The profit rates of the unlisted commercial banks in Europe show no tendency to converge to any type of European average; there is some evidence profit rates for unlisted banks converge to a country-specific average. We read these patterns as suggesting U.S. banking market is reasonably well integrated, but that the banking market in Europe appears to be far from being integrated. We close this section with some thoughts on the relationship between the introduction of the common currency in the euro area and banking integration.

Section 6 offers some final thoughts on how the results might inform future policy discussions regarding financial integration.

2. The law of one price revisited

Intuitively, assessing integration using the law of one price seems appealing. Indeed, for many financial instruments such as government bonds, or high grade corporate securities, checking for the convergence of prices is standard practice. In the case of bank products, however, heterogeneity that invariably is present will undermine this type of comparison. Banks offer highly differentiated products to their customers, which may frequently be tailored towards their specific life circumstances, preferences, risk characteristics and needs. Unless one accurately controls for these differences, which may very likely systematically differ across countries, the law of one price will not send a clear message regarding the state of integration.

[Chart 1 about here]

We illustrate this point in two ways. Chart 1 shows our understanding of the standard view of financial integration that underlies law-of-one-price tests using generic supply and demand schedules. This characterization presumes that there is a single demand (curve which is common across markets and customers) and different supply curves. The standard view presumes that if we observe more than one price for a similar product (as in the chart with P1, P2 and P3), then this is evidence for market segregation and a lack of integration. In the language of the ECB definition of integration the equal treatment of customers across markets would not be satisfied since identical customers are facing different prices.

The logic behind the ECB definition would be that the common set of regulatory rules would lead supplier S1 to capture the market, because she is the low cost provider of the financial service. So she should supply Q3 and the prevailing market price should be P3. Under these circumstances the law of one price will give an accurate picture of the degree of financial integration.

[Chart 2 about here]

Now consider Chart 2. Again, we would observe multiple prices (P1, P2, P3). But in Chart 2, there is only one supply curve and the observed violation of the law of one price is due to unobserved heterogeneity in demand. The demand variation may be a function of differences in preferences, risk characteristics or other demand characteristics in different

markets (countries). In this case, all of the conditions required under the ECB definition of integration might hold.

Thus, as a purely logical matter, tests for the law of one price implicitly assume that demand for bank's products is homogeneous across markets and products.[2] If there were sufficient harmonization across countries of all the factors that might lead to violations of the pre-conditions for capital structural irrelevance, then perhaps this assumption might be reasonable.[3] But we know statutory corporate tax rates differ considerably, and effective rates show even larger differences; for instance, Mintz (2006) reports that effective average corporate tax rates in France, Germany, Italy, and Spain are 32.1%, 38.1%, 30.2% and 23.2%. So based purely on differences in the tax advantages of interest deductibility, the preference for debt versus equity financing should differ in these countries. Consequently, there is no reason to expect demand for bank loans to be equalized and hence prices on bank loans to converge.

On top of the tax issues, the large literature on differences on the effectiveness in corporate governance across countries, imply potentially differential benefits of debt financing to control agency costs. These considerations would generate further variation in the demand for debt, and likely the monitoring provided by banks.

Once demand differences are acknowledged, deciding how to describe the state of market integration becomes much more difficult. The well known literature on price discrimination following from Varian (1985) suggests that prices would likely differ in the presence of cross-market differences in demand. This may or may not entail any efficiency or welfare costs.

One way to see the subtleties involved is to suppose that the ultimate source demand differences can be traced to variation in the costs that different customers face in searching for credit. This seems like a plausible benchmark in the context of many retail bank products. In this case, the large body of research dating back to Salop and Stiglitz (1982) becomes relevant. These models of spatial competition describe conditions under which price dispersion for *identical* goods can arise in equilibrium. In this case, even within countries prices would not converge. Note that in this class of models, financial service firms would

[2] For an argument along similar lines, see Perez et al. (2005).

[3] One can summarize the necessary conditions for the Modigliani and Miller capital structure irrelevance as requiring that i) investors and firms can trade the same set of securities at competitive market prices equal to the present value of their future cash flows; ii) there are no taxes, transactions costs, or issuance costs associated with security trading; iii) a firm's financing decisions do not change the cash flows generated by its investments, nor do they reveal new information about them. See Berk and DeMarzo (2007) Chapter 14 for further details.

enter the market and drive profit rates down to the level of the entry cost. In this case there would be no inefficiencies in the market, despite the price dispersion.

For all these reasons, it seems to us the conditions needed to construct an informative test for integration based on the law of one price are very unlikely to prevail. Hence, we look for a different type of test.

3. Return on assets as a measure of bank integration

Stigler (1963) kicked off a large literature in industrial organization based on the observation that in equilibrium (with well functioning markets) the expected returns of comparable assets in an economy should be similar. Stigler's empirical work (and all of the subsequent work which we have found, such as Fama and French (2000)), has been conducted using non-financial businesses. We explore whether the returns on assets of banks across different markets/countries converge and suggest that convergence of profitability is a preferable measure of financial integration to the law of one price.

Convergence would only be expected if the structure of the retail banking industry is such that (i) product markets are contestable and (ii) the market for corporate control operates efficiently across markets.[4] While neither of these conditions has received much attention in the discussion over retail banking integration, they seem to be essential pre-conditions for an integrated equilibrium. More specifically, if these two conditions hold, the implications for the return on assets of banks in different countries are straightforward. If a bank earns rents in a market, the threat of a new entrant should drive down these rents towards the equilibrium value. If a bank underperforms in a market, a more efficient competitor should take this bank over, driving returns on assets up towards the equilibrium value.

We should emphasise that contestability and a functioning market for corporate control are necessary and sufficient conditions for financial integration to take place. For example, consider the hypothetical monopoly supplier that we argued earlier might satisfy the ECB definition of integration. If this monopolist were faced with a threat of takeover (possibly from outside the euro area) and the market was contestable, then the banking services would be provided efficiently at marginal cost. Profits would converge and we would identify the market as integrated. Conversely, if there was not any takeover pressure,

[4] We presume throughout the analysis that all banks can meaningfully compared. Banks specialize so as to fill very different niches, then the Stigler reasoning breaks down since effectively the banks would not be competing. Hence, we do not control for risk or make any other adjustments to reflect differences in operating practices or strategies.

or if the market could not be captured by a competitor, then prices might differ across locations and/or be priced above marginal cost. In this, case profits need not converge and we would judge the markets not to be integrated.

Likewise, the models predicated on the Salop and Stiglitz depiction of spatial competition also posit entry as an equilibrating mechanism. In that framework, banks choose where to locate by spreading out so that the profits are competed down to just cover entry costs. Given homogeneity of regulations across the euro area this would also lead to convergence in profits.

Empirically, we look for convergence in the return on assets (ROA) of banks estimating variants of the classic partial adjustment equation.[5] Under rational expectations we can use realised ex-post values as a proxy for expected returns (e.g. Cochrane, 2001) and start with a specification of the form

$$\Delta ROA_{it} = \eta + \lambda(ROA_t^* - ROA_{it-1}) + u_i + v_{it} \qquad \textbf{(1)}$$

In what follows we consider several models of the long run equilibrium profitability, ROA*. The actual estimating equation is the differenced form of (1)[6]:

$$\Delta ROA_{it} = \alpha + \lambda \Delta ROA_t^* - \beta \Delta ROA_{it-1} + w_{it} \qquad \textbf{(2)}$$

In principle, the coefficient on the lagged dependent variable, β, should equal 1-λ. But as emphasized by Caballero and Engel (2004), the ordinary least squares (OLS) estimate of β is biased towards zero if changes in profitability are lumpy. The intuition for this econometric problem is easiest to see under the extreme case when changes in ROA are always discrete and ROA* is a random walk. In this case, the OLS estimate of β can be deduced by considering 4 possible terms based on whether the ROA adjusted either at t-1 or t. In three of these cases, there was no adjustment in either or both periods so that the covariance between the change ROA at time t and t-1 will necessarily be zero. The only time when a correlation is possible is when there is adjustment in consecutive periods. Because the t-1 adjustment would optimally put ROA at its equilibrium value, there would be no way to predict whether

[5] An alternative to using banks' profitability would be to check for convergence in banks' profit or cost efficiency. For a survey of this literature see Hughes and Mester (forthcoming). We present results for one alternative measure of bank profitability (ROE) below.

[6] This specification is derived by taking lags of both sides of the equation and taking the difference. The constant term would be zero but as explained in the next footnote, for certain specifications we consider samples where the mean adjustment is non-zero by construction. So we include the constant in all specifications to permit comparisons across specifications.

the subsequent shocks would involve upward or downward adjustment. So on average these two changes will be uncorrelated as well.[7]

Our theory implies that the adjustment mechanism is likely to involve discrete entry and exit decisions, so we would expect the change in profitability to exhibit considerable kurtosis. We show below that this is indeed the case, so we will infer the adjustment speed from the change in the estimated target for profitability and make no attempt to impose a restriction linking the coefficients on ΔROA* and the lagged dependent variable.

This reasoning suggests the following (strong) definition of convergence.

Strong definition of integration: The world banking market is integrated if there is a common ROA* to which all banks converge.

There are many reasons (including regulatory) that banks in the U.S. and Europe might find it difficult to use the same business model in each location. If that is true then pressure from banks on the different continents driving convergence may be weak.

Hence, we also consider weaker definitions of integration. Our second definition requires that all banks in the European Union (E.U.) converge to the same equilibrium value of ROA. Hence:

Weak definition of integration: The E.U. banking market is integrated if there is a common ROA* to which all E.U. banks converge.

To clarify the interpretation of the results for integration in the E.U., we also study the behaviour of U.S. banks. We do this because the U.S. banking market is generally considered to be integrated and (relatively) efficient (although we do test this presumption). Accordingly, we compare both the equilibrium value ROA and the estimated speed of convergence for both U.S. and European banks. We view the U.S. results as providing both a check of our procedure and a quantitative benchmark for the European estimates.

One useful feature of our framework is that it naturally suggests culprits that might be responsible if integration is absent. In particular, besides just estimating (2) for all banks, it is informative to check whether the underperforming banks raise their profitability or whether

[7] There may be a second problem with estimating equation (2) with OLS, the lagged dependent variable on the right hand side may be correlated with the error term (Nickell, 1981). We discuss some instrumental variables estimates that potentially attend to this concern below.

highly profitable banks see declines in profits.[8] If underperforming banks raise their profitability, we would interpret this as evidence in favour of a functioning market for corporate control forcing them to improve their performance.[9] If highly profitable banks see their profits decline quickly, this would be evidence for contestability in banking markets, in which the threat of entry or actual entry quickly eliminates rents.

These possibilities suggest that it would be useful to conduct the tests controlling for differences in contestability or the effectiveness of corporate governance. This leads us to estimate ROA convergence separately for different types of banks. Both contestability and the market for corporate control should be fully operational for listed banks, while the threat of a take over may be considerably weaker for an unlisted bank. Hence, for unlisted banks we would expect much slower ROA convergence from below. We would expect adjustment due to contestability to be similar for unlisted and listed banks; if we find differences here, this would be strong evidence of lack of integration.

Finally, the tests will be conducted deflating profits by the book value of assets (rather than the market value.) There are several reasons for this choice. The structure of the European banking sector is one of them. As we show below, the number of listed banks for which we could conceivably calculate market values is low in Europe. By limiting our analysis to these banks we would miss an important share of the European retail banking sector, especially in Germany, where both savings and cooperative banks are important. Indeed, the differences between listed and unlisted banks are themselves informative so that ignoring the non-traded banks would reduce the power of our tests. Moreover, as a practical matter, proper measurement of the market values of banks' assets would require market values of the loan portfolios of banks, which are unavailable. Lastly, the efficiency of stock market valuations would force rates of return measured at market prices to converge, irrespective of the degree of integration. The point of our procedure is to see operating performance (i.e. the cash flows produced by the banks for a given book value of assets) convergences, not whether the stock market functions properly. Hence, our measure is only informative about integration when the analysis is done using book values.

[8] We allow the constant in equation (2) for precisely this reason. When estimated on a sample of banks whose ROA is either above or below ROA* it would make no sense to omit the constant. So to permit comparisons in the full sample estimates we also allow an intercept.

[9] Given that we are estimating continuous albeit lumpy adjustment, we think of the main mechanism as the threat of takeover more than a potential takeover itself.

4. Data

We confine the study to banks in France, Germany, Italy, Spain, and the UK, and include U.S. banks as a benchmark. We start with all consolidated and unconsolidated balance sheet data for banks in these countries that are available in the Bankscope database. We first eliminate all banks that are part of the consolidated balance sheet of another bank. We track banks from 1994 to 2006. We also eliminate banks with zero or negative total assets, missing post tax profits, total customer loans, total deposits, interest earnings and operating expenses. We drop banks that had fewer than 4 observations and observations in the bottom or top 2% of the change in ROA.

The resulting distribution of bank/year observations is given in Table 1. About two thirds of the observations are from E.U. countries, with Germany accounting for 46 percent of the sample and the U.S. accounting for just under 1/3.

[Tables 1 and 2 about here]

Data on the type of banks are reported in Table 2. Roughly 40 percent of the sample consists of commercial banks or bank holding companies; below we group these banks along with the handful of medium and long-term credit banks and real estate banks into the "commercial bank" category. Sixty percent of the commercial banks are U.S. institutions.

The banks not counted as commercial are savings or cooperative banks. The location of the savings and cooperative banks across countries is also very uneven. Almost all cooperative banks are either located in Germany (8,813 bank/year observations) and Italy (1,980) bank/year observations) and are extremely small. Savings banks are predominantly located in Germany (5,981 bank/year observations) and the U.S. (2,414 bank/year observations).

In Table 3, we present sample statistics for the level and change of ROA. We compute return on assets as the ratio of post-tax profits divided by total assets. The mean return on assets is 0.62%, which is somewhat lower compared to the average value of ROA of 0.8% obtained in a very large cross-national sample in Demirguc-Kunt and Huizinga (1998). The distribution is skewed to the right with a median of 0.45%. As one would expect, the mean and the median of the first difference of ROA are zero or very close to zero. Importantly, the kurtosis of the change in ROA is 8.12, which suggests that the lumpiness concerns discussed by Caballero and Engel (2004) are quite relevant.

[Table 3 about here]

When estimating equation (2) we must construct an estimate of ROA*. The essence of the Caballero and Engel bias argument is that firm-specific proxies for the target level of profitability will still be plagued by the effects of infrequent adjustment. [10] Fortunately, aggregate variables can be used to construct a target measure and in our application, the mean rate of profitability is a natural candidate target. So we will consider various mean rates of profit as the equilibrium target.

Chart 3 shows the mean rate of returns for all banks in the sample. It is quite clear that there are substantial differences in profit rates across the counties in our sample. U.S. profit rates are consistently higher than elsewhere and German rates are consistently lower, and until the last couple of years of the sample the gap between the two does not narrow. Given the different governance mechanisms and profit objectives across banks and the different percentages of banks types across countries we do not view these differences as particularly informative.

Chart 4 breaks out the banks into categories that we find more meaningful. The upper panel shows the ROAs for the publicly traded banks; there are 699 banks, with three quarters U.S. based. These banks presumably have a strong profit motive and are potentially taken over if they are poor performers, so that both the necessary pre-conditions for our test hold for these institutions. The profit rate distribution, especially in the early part of the sample, is quite dispersed. As in Chart 3, the U.S. banks show persistently higher profits than the others. Given the high percentage of U.S. banks in the sample this makes the mean rate for all the listed banks higher in every year than the average for each of the European countries. As a second point of reference, the dashed line in the chart shows the average for the European countries only. By the last few years of the sample the average profit rates narrowed. For example, in 1996 the range of average profit rates across countries was 91 basis points, and by 2006 the range had shrunk to 54 basis points.

The second panel shows commercial banks that are not publicly traded. These banks are supposed to maximize profits but if they are not doing so it may be costly to acquire

[10] Fama and French (2000) build a firm specific target and use the dividend payout rate, a dummy for dividend paying firms and the ratio of the market value of equity to the book value of equity. Even if we were to ignore the lumpiness issues, these variables would not work well in our context. For example, we have many non-listed firms so we cannot use the market to book ratio. We did not have complete data on dividend payments available either. Virtually all large listed banks pay dividends and for the unlisted ones the data are not available. It is not clear for the cooperative banks whether dividend payments should be thought of in the usual sense (because the banks can pass profits back to their members in other ways such as through lower fees). Further, we are interested in whether banks converge to a common target, rather than a firm specific target.

control to correct any underperformance. Again the U.S. banks are noticeably and consistently more profitable than their European counterparts. As a reference, we include the average profit rate for the listed European banks. While the mean for the listed banks is in the middle of the distribution from 2000 onwards, the distribution of profit rates if anything is widening slightly over the last 6 years; while in 1999 the difference in average profit rates of the unlisted European banks was 26 basis points, by the end of the sample the spread was 43 basis points.

The last panel shows the profit rates for savings and cooperative banks. A priori these banks satisfy neither of our necessary conditions for profit convergence – there are so few of these banks in the UK that we omit their average from the picture. Recall that most of the banks in the sample are in Germany and the U.S. and through 2003 the movements in the profit rates in these countries appear to be completely disconnected, before converging somewhat in the last years of the sample. The ROA in the other three countries also narrowed substantially at the end of the sample, but the averages over the prior years were very different.

5. Convergence Estimates

5.1. Baseline

We turn now to more formal econometric tests to assess convergence based on estimating equation (2) for the three groups of banks in Chart 4. Because the pre-conditions involving contestability and corporate control most naturally hold for the listed banks, we begin by estimating the equation for them. The first column in Table 4 shows that listed banks profit rates move toward the average for all banks in the sample, closing half the gap between their own level of profits and the target each year.[11] Fama and French in their investigation of non-financial firms estimated the speed of convergence (to a firm specific mean) to be roughly 0.4. The lagged dependent variable has a significant negative coefficient, which based on the reasoning on Caballero and Engel is not surprising.[12] Consequently in

[11] The standard errors are clustered at the bank level throughout our analysis. If instead we cluster by date the standard errors for U.S. samples fall and those for the E.U. samples tend to rise somewhat.

[12] The intuition is as follows. If the adjustment involves discrete actions and the ROA* has a trend, then the periods of inaction will cause that the typical change in the actual ROA to be less than the trend. Consequently, the longer the period in between the adjustments, the larger will be the observed action to catch up. Without making specific assumptions on the stochastic process for the trend we cannot calculate the magnitude of this bias.

what follows we ignore the coefficient estimate on the lagged dependent variable and concentrate instead on the implied estimate for λ from the ROA* proxy.

[Table 4 about here]

Based on Chart 4, we know that the average profit rate for the full sample is driven by developments in the U.S. Moreover, Chart 4 also tells us that the average in rate in each of the European countries lies below the sample average in each year. So based on these considerations there are good reasons to doubt the robustness of this initial specification. In the second specification in Table 4, we drop the U.S. banks and re-estimate the equation. This regression confirms the hunch that the European banks are not tracking the overall sample average profit rate. The estimated value for λ is negative and insignificant from zero. Hence the apparent convergence from the first specification is entirely due to the U.S. banks and there is no evidence that European banks are mirroring their U.S. counterparts. Therefore, the strongest version of integration fails.

The next two specifications in Table 4 explore weaker tests of convergence, asking whether the U.S. banks' profits move with the average in the U.S. and the European rates move with the European average. Both of these tendencies are present. The U.S. banks convergence is, if anything, implausibly high, with λ estimated to be 0.85. Taken literally this implies that virtually all profit differences are eliminated within one year. We suspect that some of this comes from the fact that our sample includes a period substantial consolidation of the U.S. banking market, when the largest listed banks took over many of the middle-sized banks that had been prominent prior to the possibility nationwide branching -- see Jones and Critchfield (2005) for survey of overall consolidation trends in the U.S.

For the European publicly traded banks, we find significant convergence towards the mean rate for Europe. The estimated value of λ is 0.33 is plausible and significantly lower than the U.S. estimate.[13] Thus, European listed banks do appear to be operating in an integrated market.

Non-listed banks have prominent market shares in both the U.S. and Europe. In this sample, the percentage of European bank assets residing in listed banks is 53%, while the analogous percentage in the U.S. is 47% in 2006. Therefore, the finding of convergence for listed banks in the E.U. and U.S. is not a sufficient statistic for the overall state of market

[13] Not surprisingly, the U.S. listed banks are not converging to the average profit rate of the European banks nor are the European banks moving towards the average profit rate for the U.S. banks.

integration. So we next ask whether the non-traded banks are also moving to towards the average profit rates for the listed banks.

For the U.S. the answer is yes. The non-listed commercial banks show a significant propensity to move towards the average rate of profit for their listed competitors. The estimate for λ is .431, which is significantly below the rate for listed banks. A lower speed of convergence for unlisted banks is not surprising. We expect that in markets where high profits are being earned competition among unlisted banks and from listed banks would compete down any rents. But, in cases where an unlisted bank is under-performing, taking it over may be much more costly than the taking over a poor performing listed bank. This second consideration would lead to a lower average speed of convergence. We explore this conjecture below.[14]

The European results for unlisted banks are strikingly different from the U.S. The estimate of λ for unlisted commercial banks is -0.014 and insignificantly different from zero. The corresponding coefficient for savings and cooperative banks is -0.06 and significant at the 5% level. Hence, there is no indication that the profit rates of unlisted banks in Europe are tied to profit patterns for listed banks. Hence, even our weak definition of integration fails for unlisted and non-commercial banks in the E.U.

5.2 Further tests

We next explore whether the mechanisms suggested by our theory appear operative. In particular, we ask whether banks whose profits are above ROA* fall (due to competition) and whether banks with below target profits improve (due to a threat of a takeover). We view these predictions as asymmetric because competition should always be a force to dissipate rents, but taking over or restructuring an underperforming bank is costly. So if corporate governance changes are associated with a high fixed cost, they may be difficult to implement. This is true even for listed banks, as many of the gains of a takeover frequently accrue to the shareholders of the existing firm (e.g. Shleifer and Vishny, 1988). Furthermore, cooperative banks may not even have a profit maximization motive so if they were recording low profits they might have little incentive and no outside pressure to improve. Accordingly in these

[14] For completeness, the table also includes information on savings and cooperative banks. Remarkably the profits of savings banks in the U.S. also tend to converge to the rates of listed banks. The coefficient for λ is 1.15. We find this result surprising and puzzling for at least two reasons. One is that there is abundant evidence that savings banks have a fundamentally different business model than commercial banks, especially large commercial banks (Critchfield et al (2004)). The conventional view is that in the U.S. community banks hardly compete with large commercial banks. Moreover, it is often very difficult to take over community banks. Hence it is not clear what mechanism would force convergence for these banks.

tests we study only commercial banks (listed and unlisted) where there is no ambiguity about the management objectives.[15]

We refine the basic predictions about the effects of contestability and corporate governance in two ways. First, we expect all commercial banks (listed or not) to be subject to competitive pressure. Thus, we expect abnormal profits to be competed away for all commercial banks. Second, we expect an asymmetry in the effect of corporate governance, with listed banks being easier to restructure than unlisted banks.

[Table 5 about here]

The first two specifications in Table 5 show the estimates of λ for listed U.S. banks that are below and above ROA*. In both cases, λ is significantly positive, although the estimate for the underperforming banks is implausibly large. The estimates suggest that competitive forces and corporate governance are both operating for these banks.

The next two columns show the analogous estimates for the E.U. listed banks. Both the estimates are close to 0.3, and thus effectively the same as the estimate from Table 4 where the speed of adjustment was restricted to be the same in both directions. The standard errors are now much larger, so we cannot be confident that the estimates are different from zero. Hence, the evidence for contestability and the market for corporate control operating with respect to the E.U. mean is relatively weak. One potential explanation is that this is a sample size problem: We have data for only about 100 listed banks (and 600 observations) in the E.U. as opposed to more than 400 banks (and more than 2000 observations) in the U.S. This accurately reflects the limited number of listed banks in the E.U. so there is nothing that we can do about this shortage of data.[16]

The next pair of estimates shows the results for unlisted U.S. commercial banks. The underperforming banks do not seem to raise their profits. Hence, the pressure on poorly performing unlisted banks to improve performance through the market for corporate control is weaker for unlisted than for listed commercial banks. In contrast, high profit unlisted banks

[15] We are ignoring agency problems and corporate governance issues here.

[16] It is important to distinguish between the number of listed banks and their market share. In the U.S. there are hundreds of listed banks. In some European countries, most notably Spain and the UK, there are a relatively small number of listed banks operating, but their market share exceeds the market share of listed banks in the U.S. This points to another potential reason for the weaker estimated convergence among European banks: if these mega-banks are so large that no domestic institutions can acquire them, then the only potential buyers might be outside the country. If so, the fixed costs involve in turning these banks around will be higher for the relevant suitors and the pressure to reform may be weaker.

do tend to see their rents competed down (and the estimate is significant at the 1% level). This pattern is consistent with the view that competitive forces are operative for these banks even if there are impediments to a functioning market for corporate control.

The final estimates in the table show the results for unlisted E.U. commercial banks. The estimate for the underperforming banks is insignificantly different from zero suggesting that they face no pressure to raise profits. The point estimate for the relatively high profit banks is negative (i.e. they tend to move away from the equilibrium value) but insignificantly different from zero, implying that competition pressure is also absent. The failure of under-performing banks to improve is not surprising, but the absence of competitive pressures among unlisted commercial banks is noteworthy. To explore this further we examined whether either finding was due to banks in one individual country. This does not appear to be the case, so we do not report the results; we obtain the same results as shown for the unlisted European banks when we re-estimate the regressions omitting each country.

[Table 6 about here]

As a final assessment of the unlisted European banks, we re-estimate equation (2) using the within-country mean ROA for unlisted commercial banks as ROA*. The results are reported in Table 6. The first column shows that profits do converge to these country-specific targets profit rates. The estimate for λ is 0.258 and hence is close to the estimate for listed banks (from Table 3). The next two columns show that both under-performing and high profit banks also converge, although the estimate for the high profit banks is only marginally significant. [17]

When we repeat this test for listed banks we find no convergence, i.e. the profits of listed banks in each country do not converge to the average profits of the unlisted banks in that country.[18] Hence, there appears to be incomplete integration between listed banks on the one hand and unlisted banks on the other. Put differently, we do not find any proxy for target profitability that governed both the listed and unlisted European banks, even within countries.

The overall picture that emerges is one of limited bank integration throughout Europe and of incomplete bank integration even within countries in Europe. For the relatively few banks whose shares are publicly traded, profit rates do tend to move in tandem and converge

[17] If we repeat this exercise for the cooperative and savings banks in Europe their ROAs also converge to the within country mean ROA of cooperative and savings banks. As in the case of the U.S. savings and cooperative banks, the estimated coefficients for these regressions seem implausibly large.

[18] To save space we do not show the results, but the point estimate for λ that is analogous to the specification shown in the first column of Table 6 is 0.16 with a standard error of 0.345.

to the E.U. average rate. But the vast majority of banks are not listed. These banks' profits do not tend to move in step with the listed banks and instead tend to converge only to a country-specific target.

It may be tempting to argue that these results are attributable to the very simple econometric specification that we have used. That the same specifications deliver a very different set of results in the U.S. suggests otherwise.[19] In the U.S. the listed banks profits converge to the average level (although at a much faster rate than in Europe). Likewise, the high profit unlisted banks also see their profits competed away and they converge to the same profit rate as for listed banks. This suggests to us that there is nothing mechanical about our procedure that precludes finding integration in a market.

We use ROA as our baseline measure because given differences in taxes alluded to above, bank leverage ratios could differ, and hence expected returns on equity could differ.[20] As a robustness check, however, we also re-estimated the model using return on equity, ROE, rather than the return on assets, ROA as our profit measure.

Table 7 shows the results for the most noteworthy specifications reported in Tables 5 and 6 with ΔROE_t as the dependent variable and ROE* in place of ROA*. As before, we find convergence for listed banks in both the U.S. and the E.U. and convergence of unlisted banks to the listed ROE* only in the U.S. Unlisted banks in Europe do not show any convergence towards the equilibrium ROE. The difference to the results with ROA are mainly in the speed of adjustment of listed banks in the E.U., which is now of comparable magnitude to that of listed banks in the U.S. We also confirm the finding that underperforming listed banks adjust up and high profit listed banks adjust down in the U.S. and the E.U. For unlisted banks, high profits are competed away in the U.S., but underperforming unlisted banks continue to do so in the U.S. Neither mechanism seems to be operable for unlisted banks in the E.U. All of this is consistent with the results for ROA in Tables 5 and 6.

[19] We also doubt that the difference in the U.S. and EU results are attributable to other econometric problems. For instance, we know that the coefficient of the lagged dependent variable in regressions of the form as in equation (2) is biased. Phillips and Sul (2003) show that the bias that affects the lagged dependent variable can also lead to bias in the coefficient on other variables in the equation. Unfortunately their results suggest that the direction of the bias is a complicated function of several factors which make it difficult to determine even the sign of the bias. We re-estimated equation (2) using the second lag of ΔROA as an instrument for the lagged dependent variable. This does alter the coefficient on the lagged dependent variable substantially, usually making it closer to zero, but the patterns of convergence across different groups of banks and across regions remain robust to this change in estimation procedure.

[20] ROA, in contrast, may be affected by the degree to which banks have off-balance sheet operations, while ROE would not.

5.3. The role of the euro

Unfortunately, because we are forced to rely on changes in ROA* to estimate the speed of convergence, our short sample does allow us to generate meaningful pre- and post-euro estimates. So quantifying any changes in the state of integration that have been associated with the introduction of the euro is not possible.[21] Nevertheless, the structure of our test suggests that competition policy and corporate governance reforms will be needed to promote more banking integration. Obviously the common currency does not directly influence either of these factors, so any impact of the euro would be through an indirect channel.

Has the euro had an effect on the ease with which banks can enter markets across countries? At first glance, it is difficult to see how the euro could have had a first order impact. Regulatory reform during the late 80s and early 90s, and in particular the 2nd Banking Directive of 1989, permitted (in theory) the establishment of subsidiaries and branches of any bank residing in the E.U. in any other E.U. country. Legally, it eliminated any impediments to cross-country banking and cross-country establishments of branches or subsidiaries within the E.U.

What could explain the lack of cross border contestability in this paper? Entry can take place through takeovers, the establishment of branches and subsidiaries or the initiation of direct cross-border operations. As regards to takeovers, Köhler (2009) presents evidence that impediments seem at least to some extent to relate to nationalist motives. Köhler shows that opaque merger control procedures significantly reduce the likelihood of foreign ownership of a bank especially if this bank is large. Opaque procedures permit more discretion by the supervisor or other government authorities in blocking the acquisition of a domestic bank by a foreign bank. Prominent recent examples where authorities seem to have thwarted cross-border transactions include the failed takeovers of Banca Antonveneta and Banca Nazionale de Lavoro by foreign banks in Italy or the French reluctance to permit foreign bidders for Societe Generale. [22] Clearly, if national authorities are able to block cross-border mergers, this may also prevent the market for corporate control from operating efficiently.

[21] The descriptive evidence (section 4) shows that mean profit rates of listed banks, and for savings and cooperative banks converged somewhat across European countries since 2004. We cannot, however, exclude the possibility that the convergence is due to reasons unrelated to the regime shift in monetary policy.
[22] See Köhler (2009) for more details on these and other similar episodes involving different countries in Europe.

In terms of direct cross-border retail business, the common currency may have been helpful. Exchange rate risk has been eliminated and rates and conditions may be easier to compare across countries. Retail flows remain small (ECB, 2008), however, although there is a bit of evidence of an increase in cross-border retail activity in the vicinity of some borders (Fidrmuc and Hainz, 2008). On balance, it seems that there are likely many factors that impede the contestability of retail banking markets in Europe.[23]

What about the market for corporate control? We already mentioned national objectives that may be an obstacle. There is considerable evidence that following the introduction of the euro money markets have become integrated (ECB, 2008), which should have equalized the cost of funds across countries. Combined with the elimination of exchange rate volatility this should facilitate the comparability of rates of returns of banks in different countries. The under- or over-performance of a bank, therefore, can be more easily compared and evaluated. In addition deeper equity and bond markets permit easier financing of large scale transactions (ECB, 2008). Hence, the euro may have improved the corporate governance of listed banks in the euro area. Martynova and Renneboog (2006) find that non-financial cross-border corporate takeovers did increase in the euro area more strongly than domestic takeovers since 1998. Ekkayokkaya et al. (2007) present results are consistent with increased cross-border competition among bidders for banks in the post-euro era. This is consistent with the rates of ROA convergence among E.U. listed banks that we found.

The effect of increasing profit convergence on financial stability is ambiguous ex ante. The usual trade-off between greater diversification of banks' portfolios (increasing financial stability) and the fact that the similarity of the portfolios may increase overall systemic risk seems to apply (Wagner, 2009). The integration among listed banks in the E.U. which is suggested by our metric is consistent with the evidence in Gropp et al. (2009), who present evidence that cross border contagion within Europe may have increased among large listed banks.

However, unlisted commercial banks, savings and cooperative banks constitute about 50% of total assets of the banking systems of the major European countries studied here and the retail market share may be even larger. The governance of these banks is not subject to the same mechanisms as the governance of listed banks. The evidence shows that they neither respond to competitive pressures as much as listed commercial banks, nor do these banks face pressure to remedy underperformance through a threat of takeover. These

[23] It is plausible that cultural factors as in Guiso et al. (2004) are important, in particular with respect to retail banking services. We are not aware of systematic evidence on this and other factors affecting cross-border entry of markets, however.

rigidities remain in place, and as far as we can see would be unaffected by the introduction of the common currency.[24]

6. Conclusion

This paper argues that tests conducted in the previous literature for retail banking integration in the euro area may be misleading. The tests are neither necessary nor sufficient conditions for integration and tend to ignore efficiency and equilibrium concepts. We propose an alternative that tries to address these shortcomings and we argue that the convergence of the return on assets of banks may be a superior measure of banking integration in at least two dimensions. One, the return is an equilibrium concept in the sense that it reflects both price and quantity effects, as well as demand and supply aspects. Second, the test we propose also comes with natural diagnostics that help us interpret what might be responsible for a lack of integration.

Estimates from a partial adjustment model suggest that banking markets in the U.S. and Europe are very different. In the U.S. listed and unlisted banks profits converge towards the same target level of profitability. For both types of banks, if profitability is above average it tends to be pushed back towards ROA*. For unlisted U.S. banks, there is no evidence that underperforming banks are pushed towards an improvement in their performance by a threat of a takeover. Hence, for unlisted commercial banks integration fails even in the U.S. due to poor corporate control.

In Europe, only the listed banks appear to be governed by a common ROA*. For unlisted banks, we observed substantial differences across European countries in the mean profitability (Chart 4) and we find no evidence that unlisted commercial banks converge to a common equilibrium value. Perhaps somewhat surprisingly we find evidence not only for impediments to a properly operating market for corporate control but also evidence for impediments to competition. For unlisted commercial banks in Europe, rents do not tend to get competed away. This suggests not only impediments to integration across borders among unlisted commercial banks in Europe but also lack of integration within individual countries between listed banks and unlisted banks.

Our approach also highlights the importance to shift attention to mechanisms that permit an effective functioning of the market for corporate control and bank entry in a cross-

[24] Hartmann et al. (2006) show that the high share of these banks may have had an adverse effect on growth in the euro area, evidence which is consistent with the evidence presented in this paper.

border dimension. The paper shows that the large market share of unlisted, savings and cooperative banks may be an important impediment to banking integration in Europe. Our estimates also suggest focusing more attention on understanding the differences between listed and unlisted banks, and more specifically seeking to understand why the two groups are so much more different in the Europe than in the U.S.

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Chart 1. Standard view of financial integration

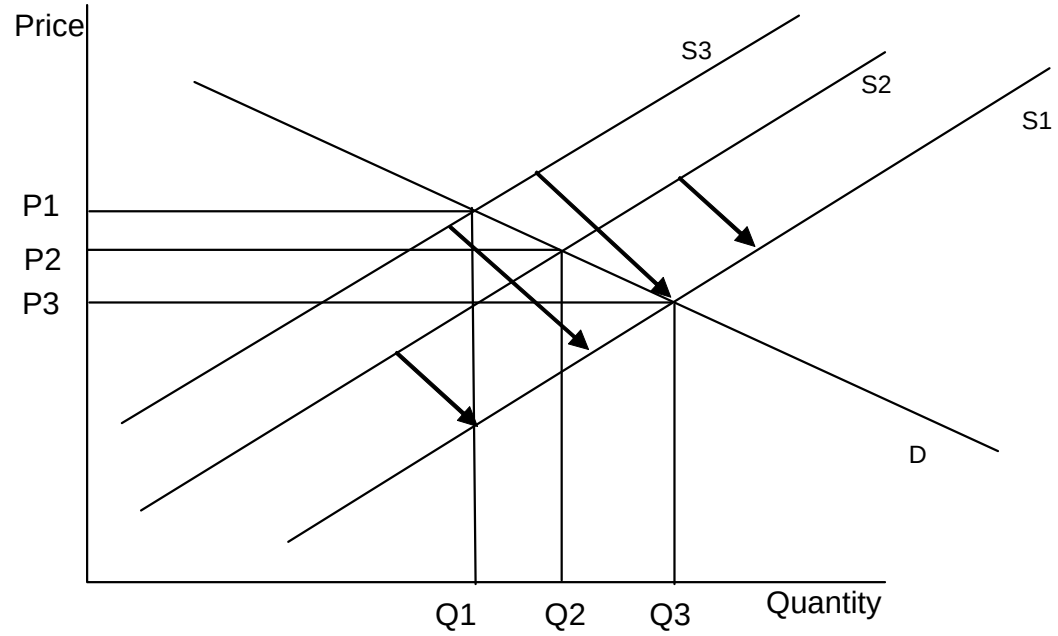


Chart 2. Alternative view of financial integration

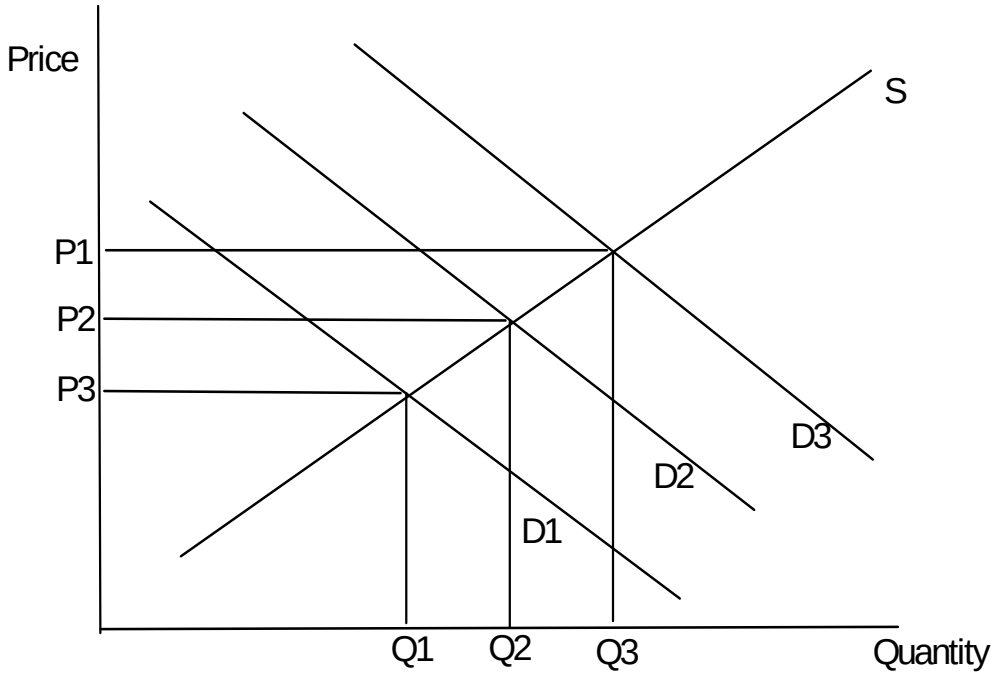


Chart 3

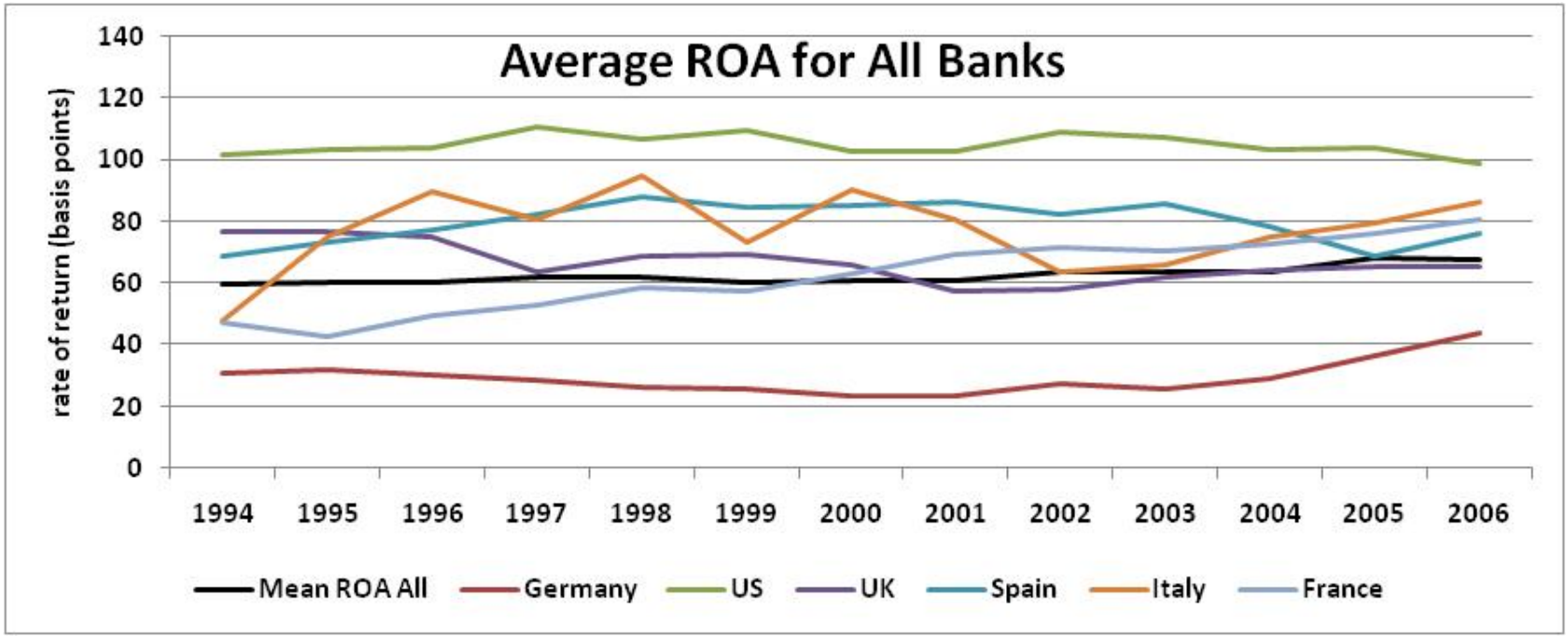
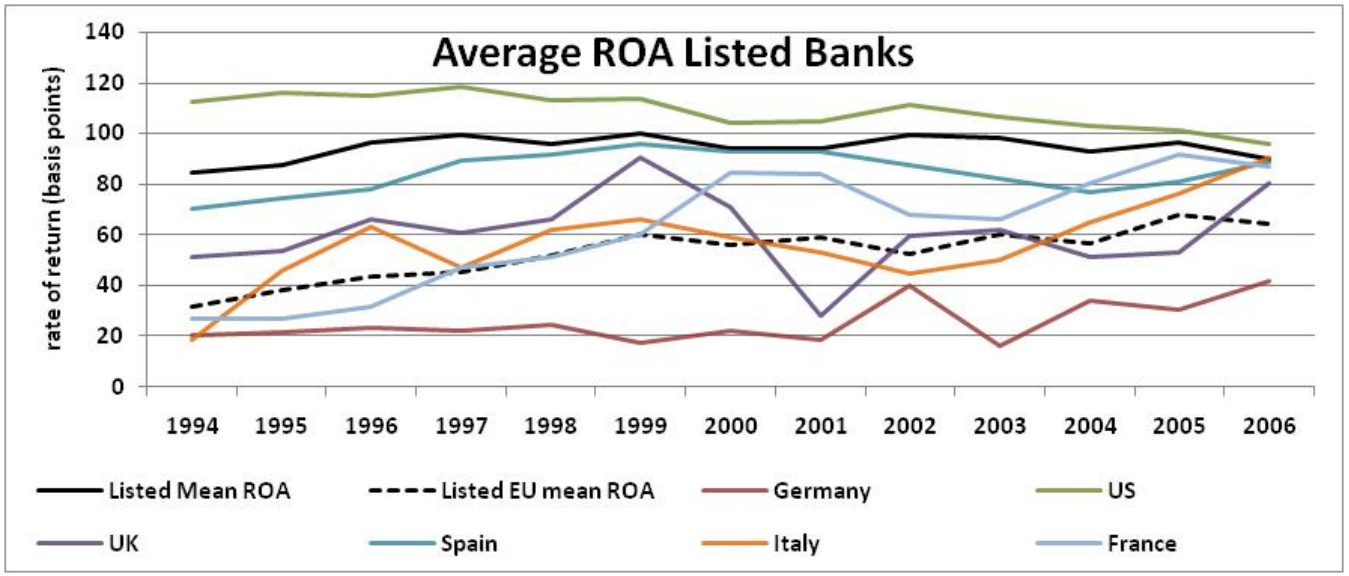

Average ROA for All Banks
rate of return (basis points)
140
120
100
80
60
40
20
0
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Mean ROA All
Germany
US
UK
Spain
Italy
France

Chart 4


Average ROA Listed Banks
rate of return (basis points)
140
120
100
80
60
40
20
0
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Listed Mean ROA
Listed EU mean ROA
Germany
US
UK
Spain
Italy
France

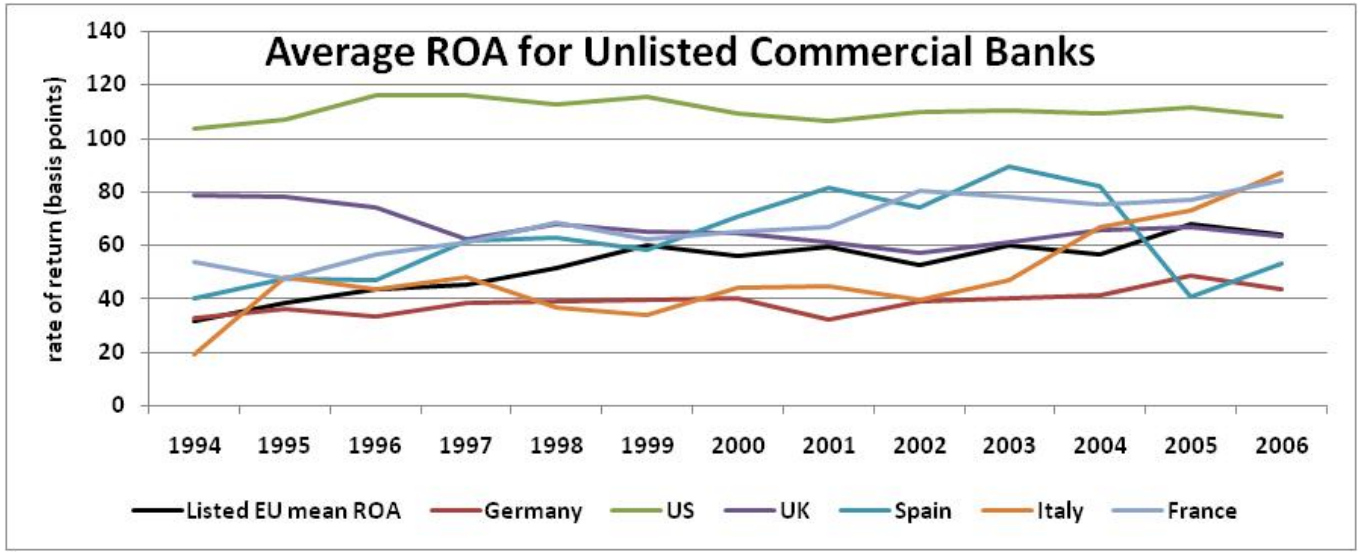

Average ROA for Unlisted Commercial Banks
rate of return (basis points)
140
120
100
80
60
40
20
0
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Listed EU mean ROA
Germany
US
UK
Spain
Italy
France

Chart 4 continued

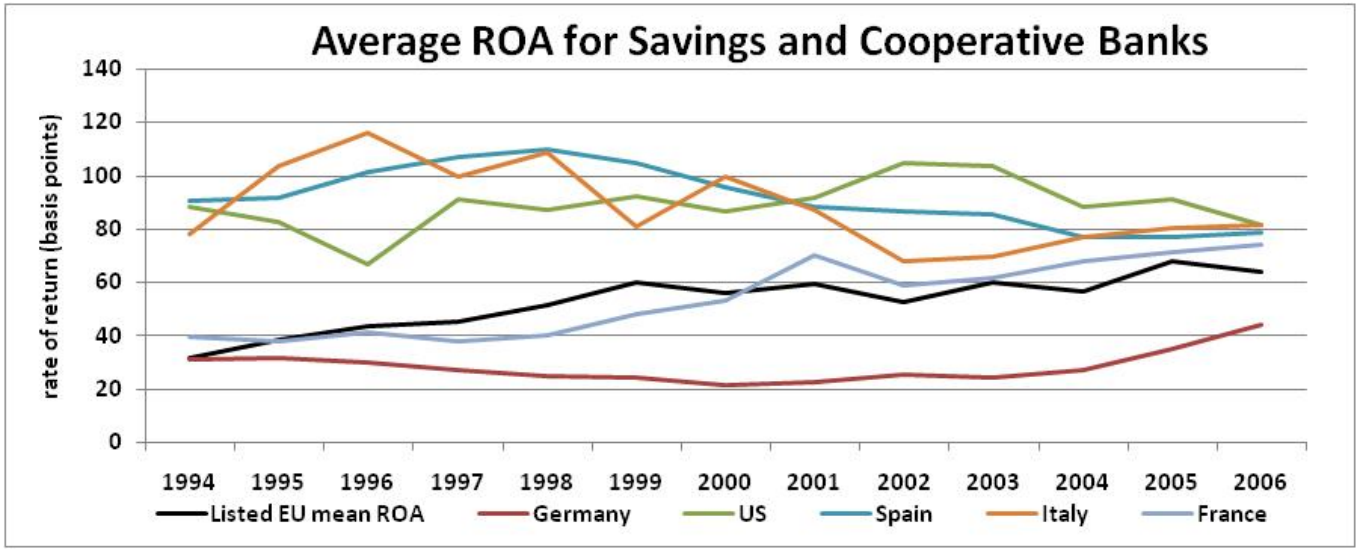


Table 1. Sample country composition

Country	Number of Banks	Percent
Germany (DE)	17,013	46.61
Spain (ES)	764	2.09
France (FR)	2,720	7.45
United Kingdom (UK)	1,378	3.78
Italy (IT)	2,686	7.36
United States (U.S.)	11,940	32.71
All	36,501	100.00

Table 2. Sample bank type composition

Bank Type	Number of Banks	Percent
Commercial Bank 1/	15,645	42.9
Savings Bank	9,271	25.4
Cooperative Bank	11,585	31.7
Total	36,501	100.00

Bank type determined based on Bankscope variable ”Specialisation (General)”.
1/ Includes banks classified by Bankscope as Bank Holding companies, medium and long-term credit banks, and mortgage banks.

Table 3. Descriptive Statistics

	Mean	Median	Standard Deviation	Kurtosis	Num. Obs.
Return on assets	0.0062	0.0045	0.0058	6.89	36,501
Change in return on assets	0.00003	0	0.0027	8.12	36,501
Return on equity	0.084	0.072	0.059	4.19	36,501
Change in return on equity	-0.0005	-0.0006	0.049	21.18	36,501

Return on assets is Pre-Tax Profits (Bankscope variable I28) divided by Total Assets (Bankscope variable A61).
Return on equity is Pre-Tax Profits (Bankscope variable I28) divided by Total Equity (Bankscope variable L42).

Table 4. ROA convergence

OLS estimates of equation (2) in the text. Standard errors adjusted for clustering at the bank level in parentheses. Sample is taken from Bankscope as described in the text. The dependent variable is ΔROA_t of bank *i*. ΔROA_{t-1} is the dependent variable lagged by one period. ΔROA^* represents the first difference of the mean of ROA of the regional sub-sample for different groups of banks as indicated in the table. ***, **, * indicates significance at the 1%, 5% and 10% level, respectively. Bank types (Listed, unlisted commercial banks, savings banks and cooperative banks) are classified using Bankscope variable Specialisation (General).

	Listed banks				**Unlisted commercial banks**		**Savings banks and Coops**	
Proxy for ROA*	**Overall listed mean**	**Overall listed mean**	**U.S. listed mean**	**E.U. listed mean**	**U.S. listed mean**	**E.U. listed mean**	**U.S. listed mean**	**E.U. listed mean**
Region	**All countries**	**All countries without U.S.**	**U.S.**	**E.U.**	**U.S.**	**E.U.**	**U.S.**	**E.U.**
ΔROA^*	0.533***	-0.14	0.849***	0.326**	0.431***	-0.014	1.147***	-0.064**
	(0.075)	(0.166)	(0.102)	(0.134)	(0.101)	(0.082)	(0.136)	(0.030)
ΔROA_{t-1}	-0.245***	-0.245***	-0.242***	-0.241***	-0.189***	-0.158***	-0.15***	-0.304***
	(0.019)	(0.049)	(0.196)	(0.048)	(0.2)	(0.022)	(0.026)	(0.011)
Constant	0.00004	0.0004***	0.00009***	0.0003***	0.0001***	0.00006	0.00006	0.000
	(0.00003)	(0.00006)	(0.00003)	(0.00007)	(0.00004)	(0.00005)	(0.00006)	(0.00001)
R^2	0.0706	0.0658	0.0813	0.0697	0.0404	0.0246	0.0544	0.0848
N	5362	1198	4166	1199	5377	5237	2397	18125
Number of banks	699	164	535	164	666	721	287	2184

Table 5. Mean Reversion for Relatively High and Low Profit Banks

OLS estimates of equation (2) in the text. Standard errors adjusted for clustering at the bank level in parentheses. Sample is taken from Bankscope as described in the text. The dependent variable is ΔROA_t of bank *i*. ΔROA_{t-1} is the dependent variable lagged by one period. ΔROA* represents the first difference of the mean of ROA of the regional sub-sample for different groups of banks as indicated in the table. Adjustment from below" and "Adjustment from above" refers to sample splits according to whether ROA of bank *i* was below or above the respective sample mean ROA* during period *t*. ***, **, * indicates significance at the 1%, 5% and 10% level, respectively. Bank types (listed or unlisted commercial) are classified using Bankscope variable Specialisation (General).

	Listed banks				**Unlisted commercial banks**			
Proxy for ROA*	**U.S. listed mean**	**U.S. listed mean**	**E.U. listed mean**	**E.U. listed mean**	**U.S. listed mean**	**U.S. listed mean**	**E.U. listed mean**	**E.U. listed mean**
Region	**U.S. Adjustment from below**	**U.S. Adjustment from above**	**E.U. Adjustment from below**	**E.U. Adjustment from above**	**U.S. Adjustment from below**	**U.S. Adjustment from above**	**E.U. Adjustment from below**	**E.U. Adjustment from above**
ΔROA*	0.922***	0.656***	0.317*	0.273	0.16	0.45***	0.101	-0.244
	(0.144)	(0.129)	(0.169)	(0.207)	(0.145)	(0.133)	(0.083)	(0.158)
ΔROA_{t-1}	-0.254***	-0.151***	-0.274***	-0.165**	-0.197***	-0.115***	-0.113***	-0.146***
	(0.028)	(0.034)	(0.067)	(0.067)	(0.028)	(0.029)	(0.030)	(0.030)
Constant	0.0005***	-0.0004***	0.0006***	-0.00005	0.0007***	-0.0004***	0.0005***	-0.0005***
	(0.00006)	(0.00005)	(0.0001)	(0.0001)	(0.00006)	(0.00006)	(0.00006)	(0.00009)
R^2	0.0901	0.0368	0.0842	0.0352	0.0437	0.0166	0.0127	0.0224
N	2026	2140	629	570	2486	2891	3164	2073
Number of banks	440	403	127	108	525	536	591	502

Table 6. Country-Specific Mean Reversion for unlisted European commercial banks

OLS estimates of equation (2) in the text. Standard errors adjusted for clustering at the bank level in parentheses. Sample is taken from Bankscope as described in the text. The dependent variable is ΔROA_t of bank *i*. ΔROA_{t-1} is the dependent variable lagged by one period. ΔROA* represents the first difference of the mean of ROA of the regional sub-sample for different groups of banks as indicated in the table. ΔROA* represents the first difference of the country-specific mean of ROA for unlisted banks as indicated in the table. "Adjustment from below" and "Adjustment from above" in columns 3 and 4 refers to sample splits according to whether ROA of bank *i* was below or above the respective sample mean ROA* during period *t*. ***, **, * indicates significance at the 1%, 5% and 10% level, respectively. Unlisted commercial banks are identified using Bankscope variable "listed institution" and "Specialisation (General)"

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	Unlisted commercial banks		
Proxy for ROA*	**Country-specific unlisted mean**	**Country-specific unlisted mean**	**Country-specific unlisted mean**
Region	**E.U.**	**E.U. Adjustment from above**	**E.U. Adjustment from below**
ΔROA*	0.258***	0.281*	0.184**
	(0.077)	(0.154)	(0.081)
ΔROA_{t-1}	-0.156***	-0.140***	-0.117***
	(0.022)	(0.03)	(0.031)
Constant	0.000	-0.0006***	0.0004***
	(0.000)	(0.00008)	(0.00005)
R^2	0.027	0.0217	0.016
N	5237	2001	3236
Number of banks	721	494	603

Table 7. Robustness: Return on Equity

OLS estimates of a modified version of equation (2) in the text; the dependent variable is ΔROE_t of bank *i*. ΔROE_{t-1} is the dependent variable lagged by one period. ΔROE* represents the first difference of the mean of ROE of the regional sub-sample for different groups of banks as indicated in the table. Standard errors adjusted for clustering at the bank level in parentheses. Sample is taken from Bankscope as described in the text. ***, **, * indicates significance at the 1%, 5% and 10% level, respectively. Bank types (Listed, unlisted commercial banks,) are classified using Bankscope variable Specialisation (General).

	Listed banks		**Unlisted commercial banks**		**Listed banks**		**Unlisted commercial banks**		**Listed banks**		**Unlisted commercial banks**	
Proxy for ROE*	**U.S. listed mean**	**E.U. listed mean**	**U.S. listed mean**	**E.U. listed mean**	**U.S. listed mean**	**U.S. listed mean**	**U.S. listed mean**	**U.S. listed mean**	**E.U. listed mean**	**E.U. listed mean**	**E.U. listed mean**	**E.U. listed mean**
Region	**U.S.**	**E.U.**	**U.S.**	**E.U.**	**U.S.** Adjustment from below	**U.S.** Adjustment from above	**U.S.** Adjustment from below	**U.S.** Adjustment from above	**E.U.** Adjustment from below	**E.U.** Adjustment from above	**E.U.** Adjustment from below	**E.U.** Adjustment from above
ΔROE*	0.775***	0.815***	0.353***	0.090	0.663***	0.706***	-0.097	0.534***	0.659***	0.655**	0.047	-0.026
	(0.099)	(0.174)	(0.127)	(0.096)	(0.126)	(0.122)	(0.170)	(0.163)	(0.221)	(0.260)	(0.097)	(0.210)
ΔROE_{t-1}	-0.357***	-0.423***	-0.304***	-0.389***	-0.408***	-0.215***	-0.317***	-0.188***	-0.330***	-0.414***	-0.331***	-0.306***
	(0.049)	(0.045)	(0.029)	(0.025)	(0.063)	(0.063)	(0.046)	(0.037)	(0.065)	(0.092)	(0.034)	(0.045)
Constant	0.0005	0.002	-0.0006	0.001	0.005	-0.006***	0.010***	-0.01***	0.015***	-0.014***	0.01***	-0.024***
	(0.0004)	(0.001)	(0.0005)	(0.0007)	(0.0008)	(0.0007)	(0.001)	(0.001)	(0.002)	(0.003)	(0.001)	(0.002)
R^2	0.13	0.17	0.09	0.12	0.15	0.06	0.09	0.03	0.12	0.15	0.09	0.07
N	4166	1199	5377	5237	2013	2153	2357	3020	706	493	3677	1560
Number of banks	535	164	666	721	445	410	512	555	139	113	663	440