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Article (Published)
(Refereed)

Original Citation:

This version is available at: http://epub.wu.ac.at/6415/
Available in ePubWU: July 2018

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To cite this article: Klaus Gugler & Evgeni Peev (2018) The persistence of profits in banking: an international comparison, Applied Economics, 50:55, 5996-6009, DOI: 10.1080/00036846.2018.1489111

To link to this article: https://doi.org/10.1080/00036846.2018.1489111

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Published online: 11 Jul 2018.

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The persistence of profits in banking: an international comparison

Klaus Gugler and Evgeni Peev

Department of Economics, WU (Vienna University of Economics and Business), Vienna, Austria

ABSTRACT
This article examines the dynamics of bank profitability in the USA, Germany, Great Britain, France, Italy and Switzerland over the period 1993–2014. We find long-run bank profit persistence in all six countries in the period before the financial crisis in 2008. Banks with large capital ratios are persistently more profitable, and there is little evidence of a link between bank size and the persistence of bank profits. Commercial (saving) banks are persistently more (less) profitable in four of the six countries. The effects of the financial crisis in 2008 differed dramatically across countries as well as across ownership types. While US banks experienced dramatic declines in the immediate aftermath of the crisis, they recovered much faster than their European counterparts and essentially retain their long run profit potential by the year 2014.

Keywords
Bank profit persistence; international comparison; ownership types; financial crisis

JEL Classification
G21; L11

I. Introduction

A fundamental premise underlying normative arguments for market systems is that competition tends to drive profits to zero and thus that the price system maximizes social welfare by equating the marginal social benefits and costs of each economic activity. There are essentially two underlying logics for the proposition that competition drives profits to zero – one based on a static view of competition and the other on a dynamic view. Under the static view, competition among an existing set of firms suffices to produce zero profits at each point in time. Under the dynamic view, the entry and exit of firms drives profits to zero in the long run and is thus consistent with there being non-zero economic profits at different points in time.

Testing whether the static view of competition is consistent with observed patterns of profits is fairly straightforward and not surprisingly such tests were the first to be performed and the preponderance of studies to date still falls into this category. Beginning with Mueller (1977), a by-now also rather large literature has developed, which tries to test the dynamic view of competition. Most of this literature has focused on the question of whether differences in profits tend to persist across manufacturing firms. The findings of these studies have been remarkably consistent. Companies, which have higher than normal profits at a given point in time, tend to continue to have higher than normal profits over time. This has been found to be true for a variety of countries and different time periods. Moreover, the differences in profitability can be economically significant. For example, Mueller (1986, 34) projected using data from 1950 through 1972 that Coca Cola would have a return on total assets of double the average in US manufacturing indefinitely.

Studies of the persistence of profits in banking have been rather rare in comparison to those focusing on manufacturing. In this article, we examine the dynamics of bank profitability using unconsolidated accounts data from Bankscope for banks in France, Germany, Great Britain, Italy, Switzerland and the United States over the period 1993–2014. All commercial, savings, cooperative and other banks in each of the six countries for which there are complete financial data over a minimum of 18 years are included in the sample. We focus on these six countries because insufficient data are available for banks from other countries over the studied period.
In the USA, financial firms other than banks have been growing much more quickly in past decades, resulting in the so-called shadow banking system overtaking the traditional banking system in size in the 1990s (Schildback, Wenzel, and Speyer 2013). In Europe, by contrast, most financing is still being done by traditional banking sector. As a consequence, the banking sectors are larger in our sample of European countries than the banking sector in the USA. The share of bank assets to GDP in 2014 is as follows: Switzerland (172.4%), Great Britain (145%), Italy (132%), France (113.5%), Germany (99.8%) and the USA (58.8%). These differences might be partly explained by the different financial systems in the USA on one hand and Germany, France and Italy on the other. Our sample includes banks in both bank-based and market-based financial systems (Levine 2005). First, in France, Germany and Italy (bank-based financial systems), banks play a leading role in mobilizing savings, allocating capital, overseeing the investment decisions of corporate managers and providing risk management vehicles. Second, in the USA and Great Britain (market-based financial systems), securities markets share centre stage with banks in terms of getting society’s savings to firms, exerting corporate control and easing risk management.

In the six countries in our sample, the share of domestic credit to private sector to GDP in 2014 is as follows: the USA (194.2%), Switzerland (169.2%), Great Britain (137.4%), Italy (89%), France (94.2%) and Germany (79.2%). Some authors argue that there are other basic differences in banking sectors among countries and present countervailing views to the bank- versus market-based financial system dichotomy explaining the leading position of the USA by a well-functioning financial and legal system. For example, the ‘financial functions view’ rejects the primacy of distinguishing financial systems as bank based or market based (Merton 1992, 1995; Merton and Bodie 1995, 2004; Levine 1997). According to this view, the crucial issue for growth is whether the economy has access to a well-functioning financial system; the exact composition of the financial system is of secondary importance. In addition, stock markets may complement banks. The ‘law and finance view’ holds that legal system differences are the fundamental source of international differences in financial development (La Porta et al. 2000). This view holds that finance is a set of contracts. These contracts are defined and made more or less effective by legal rights and enforcement mechanisms. From this perspective, a well-functioning legal system facilitates the operation of both markets and intermediaries. Following the law and finance literature, our sample includes countries with common law origin (the USA and Great Britain) and civil law origin like Germanic law family (Germany and Switzerland) and French law family (France and Italy).

Our article contributes to the literature in at least two dimensions. Studies on the persistence of profits in the banking industry focus mainly on the erosion of short-run rents. There is little evidence presented on the extent to which profits persist in the long run, nor are the factors determining differences in long-run bank profits identified. The key objective of this article is to fill this gap in the literature. First, we estimate the long-run projected profits in the banking industry in six major countries. Second, we study the determinants of the long-run projected bank profits. Briefly our findings are as follows:

Bank profits persist in the long run in all six countries. Banks with large capital ratios are persistently more profitable, and there is little evidence of a link between bank size and the persistence of bank profits. Commercial (saving) banks have significantly higher (lower) long-run projected profits in four of the six countries (i.e. in Germany, Great Britain, Switzerland and the United States) over the 1993–2007 period. The effects of the financial crisis in 2008 differ remarkably across countries as well as across the different types of financial institutions in the six countries. While US banks experienced dramatic declines in the immediate aftermath of the crisis, they recovered much faster than their European counterparts and could essentially retain their long-run profit potential by the year 2014. This is true particularly for commercial and savings banks in the USA. In contrast and consistent with casual observations, German and Italian large banks saw their long-run profit potential essentially
destroyed by the financial crisis with no indications of a return in sight.

We proceed as follows. We review the existing studies of the persistence of profits in banking in Section II. The methodology, data and some econometric issues are discussed in Section III. Our empirical findings are presented in Sections IV, V and VI. Because the data we use to test for the persistence of profits in banking (1993–2014) span the years after the recent economic crisis hit, we do separate analyses of the periods 1993–2007 and 2008–2014. Conclusions are drawn in the final section.

II. Previous work on profits’ persistence in banking

Several studies have focused on the US banking industry. Levonian (1993) examines US banks over the period 1986–1991. His results indicate that the expected rate of adjustment tends to be significantly greater than zero, although smaller than adjustment speeds found in studies of non-financial firms. Roland (1997) studies the persistence of profit for US bank holding companies, using data for the period 1986–1992, and finds that bank holding companies that generate persistent positive abnormal profits outnumber bank holding companies that post persistent negative abnormal profits. Berger et al. (2000) focused on the rankings of US banks based on their profitability. Profits were deemed to persist if a bank’s past rankings were good predictors of its present ranking. Based on this criterion, they concluded that profit differences in banking did tend to persist. Moreover, the greatest degree of persistence was observed in the upper and lower tails of the distribution of bank profitability, a finding similar to that made by Mueller (1977) for US manufacturing.


Research on the persistence of profits in banks in developing countries is scarce. Amidu and Harvey (2016) study the profit persistence in the African banking sector. Their results show a high level of profit persistence and relatively low speed of convergence. Tan (2016) examines the impacts of risk and competition on profitability in the Chinese banking industry over the period 2003–2011. This study does not show any robust finding with regard to the impacts of competition and risk on bank profitability.

Several studies in the persistence literature have focused mainly on the estimates of λ. This focus is justified if there are large differences in λ across companies. For example, a λ of 0.1 implies that only 1% of any abnormal profit remains after 2 years. It takes 44 years to reach the same level, if λ = 0.9. Lamdas of 0.9 are quite rare, however, and most studies have estimated mean λs of around 0.5 or less. As said, we thus place more weight on estimates of πip. What was interesting in the study by Mueller (1986) was that Coca Cola was predicted to earn profits double the sample mean indefinitely, not the speed at which its profits converged on this level following a shock to them.

Goddard et al. (2011) focus exclusively on estimates of λ in their study of profits’ persistence in banking. They do not even report estimates of the intercepts for their models, so that one cannot judge what the πip might be. They work with a variant of Equation (4) in which λi = λ + βXi, where Xi is a vector of variables that are thought to affect the speed at which a bank’s profits converge on the sample mean. They find several variables to be statistically significant determinants of the λs. Our criticism of their findings is that the implied differences in the λs are not economically significant. For example, for the total sample, they estimate a mean λ of 0.43. This implies that 8% of a deviation from the sample mean in year t remains after 3 years. The variable domestic-entry-denied has a significant coefficient of 0.867. Multiplied by the sample mean, this estimate increases the predicted λ by 0.078, which would raise the sample mean to 0.508, implying that only 13% of any deviation from the sample
mean remains after 3 years. This difference and others implied by the study’s estimates strike us as not large enough to justify government intervention to reduce profits’ persistence as so measured.

Goddard et al. (2011) employed the GMM to obtain their estimates, as did Goddard et al. (2013). This latter study, however, made the following adjustment to Equation (4), \( \pi_{ip} = \pi_i + \gamma Z_i \) where \( Z_i \) is a vector of variables that are expected to explain the \( \pi_{ip} \). A possible difficulty with this approach is that it assumes all of the differences in the \( \pi_{ip} \)s are explained by the variables in \( Z_i \) subject to a random error. Goddard et al. (2013) find several of the variables in \( Z_i \) to be statistically significant. Several of the reported estimates seem highly improbable, however. For example, the estimated constant for Denmark for the years 1992–1998 is 318.928. For France, it is −142.059. The \( \lambda \) for Denmark for this period is 0.364 implying a \( \pi_{p} \) of 501.5 against a mean profit rate for this firm would be 8.27. The estimated \( \lambda \) for France was 0.257, implying a \( \pi_{p} \) of −191.2 against a mean profit rate for this period of 4.76. Thus, the average Danish bank was projected to have permanent profits over 60 times larger than the average bank in the whole sample over the 1992–1998 period, while the average French bank was projected to have permanent profits over 40 times lower than the average bank in the sample over the same period. Several other estimates are equally implausible. We think this occurs because estimates using GMM for short time periods are heavily driven by cross-sectional variations, but the whole persistence story is one of time series variation.

Chronopoulos and Hong Liu (2015) use GMM to investigate the persistence of profits for US banks over the period 1984–2010. They assume that \( \pi_{ip} = \pi_p + \gamma Z_i \) and that \( \lambda_i = \lambda + \beta X_i \). They find several of the variables in both \( Z_i \) and \( X_i \) to be significant. Thus, the rather limited number of studies investigating the persistence of profits in the banking sector, like those for manufacturing, all finds the presence of profits’ persistence.

In sum, our article contributes to the previous empirical studies in at least two dimensions. Studies on the persistence of profits in the banking industry focus mainly on the erosion of short-run rents (e.g. Mariarosaria, Leonida, and Trivieri 2005; Athanasoglou, Brissimis, and Delis 2008; Goddard et al. 2011). There is little evidence presented on the extent to which profits persist in the long run, nor are the factors determining differences in long-run bank profits identified. The key objective of this article is to fill this gap in the literature. First, we estimate the long-run projected profits in the banking industry in six major countries. Second, we study the determinants of the long-run projected bank profits.

III. Methodology and data

Following the persistence of profits literature (e.g. Mueller 1977; Cable and Mueller 2008), in a static world in which all firms are in long-run equilibrium, the profits of any firm \( i \) might simply be written as

\[
\pi_{it} = \pi_{ip} + \mu_{it},
\]  

(1)

where \( \pi_{ip} \) is a constant representing the permanent profits of firm \( i \), and \( \mu_{it} \) is a random shock to these profits, which is assumed to have a normal distribution with mean zero. A firm’s profits are subject to random shocks but are essentially constant over time. Most of the literature has measured firm-level profits as either a percentage deviation of a firm’s profits-to-assets ratio from the sample/population mean or the absolute deviation. We prefer the former measure because we believe it facilitates comparisons across countries. Thus, using the first definition, a \( \pi_{ip} \) of 0.50 implies that \( i \)’s profits-to-assets ratio is on average permanently 50% above the sample/population mean. If \( \pi_{it} \) is measured as the absolute deviation from the population mean, \( \pi_{ip} \) for this firm would equal 0.04 if the population’s mean profits to assets ratio were 0.08. In a country with a population mean of 0.04, however, an estimated \( \pi_{ip} \) of 0.04 would imply long-run profits double the population mean.

The firm’s return on assets ratio (ROA) is a standard measure of performance used in the literature on persistence of profits (see e.g. Berger et al. 2000; Athanasoglou, Brissimis, and Delis 2008; Chronopoulos and Hong Liu 2015; and

\[2\] See among a few studies Chronopoulos and Hong Liu (2015).
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\( \pi_0 + \pi \) can be interpreted as a measure of the long-run cost of capital. Since \( \pi_0 \) is the same and equal the competitive return on equity (ROE) might be quite manipulable by bank management. For example, Citigroup had a leverage ratio (assets/equity) of 56% via drastically leveraging itself in the run up to the crisis (Financial Times 2008). Thus, profits related to equity would have been abnormally high. However, this high ROE can be explained by capital structure decisions of Citigroup and not by its market power/efficiency.

In a dynamic world, a positive or negative shock to a company’s profits might take several years to dissipate. To allow for this possibility, Equation (1) can be modified as follows:

\[ \pi_{it} = \pi_{ip} + s_{it} + \mu_{it}, \]  
(2)

where \( s_{it} \) is a short-run rent, positive or negative, and is expected to converge on zero over time. Thus, in a dynamically competitive economy, we would expect two things to be true. (1) Ignoring differences in risk, the \( \pi_{ip} \) for all firms should be the same and equal the competitive return on capital. Since \( \pi_{it} \) is measured as the percentage deviation from the population mean, if the average company in the economy earned zero rents in the long run, the sample mean profit rate would equal the competitive cost of capital, and the prediction would be that the estimated intercepts for Equation (2) should be zero for all firms. (2) The \( s_{it} \) movements over time must be modelled. A simple specification that implies convergence on zero is

\[ s_{it} = \lambda_i s_{it-1} + \mu_{it} \]  
(3)

where \( \lambda_i < 1 \). Convergence takes place for any \( \lambda_i \) between -1 and 1, but the most reasonable assumption is that \( 0 < \lambda_i < 1 \). In highly competitive environments, estimated \( \lambda_i \)s should be small.

Assuming that Equation (3) holds in every period, it can be used to eliminate \( s_{it-1} \). This results in the following equation, which has become the workhorse for testing for the persistence of profits in much of the literature.

\[ \pi_{it} = \pi_{ip} (1 - \lambda_i) + \lambda_i \pi_{it-1} + \epsilon_{it}, \]  
(4)

with the error term again assumed to be normally distributed with zero mean. The estimated \( \lambda_i \)s can be used to determine how quickly short-run rents are expected to disappear. The estimated \( \pi_{ip} \)s (which equal the constant term in (4) divided by \( (1-\lambda_i) \)) indicate whether there are significant differences in permanent rents across firms.

Thus, \( \lambda \) can be interpreted as a measure of the persistence of short-run rents, whereas \( \pi_{ip} \) as a measure of the persistence of long-run rents, the main focus of this study.³ A company with long-run projected profits 50% above the mean is projected to be persistently more profitable than the average company. Lambda (\( \lambda \)) measures the speed at which profits converge on \( \pi_{ip} \) but not persistent differences. If banks maintain the same ranks over time, it is because they have persistent differences in long-run profits over time (i.e. \( \pi_{ip} \)s), not differences in speeds of adjustment to these levels (i.e. \( \lambda_i \)s). If differences in long-run profits are found, the second question becomes what their determinants are.

We test for the existence of persistent differences in bank profits using unconsolidated accounts data from Bankscope for banks in France, Germany, Great Britain, Italy, Switzerland and the United States over the period 1993–2014. All commercial, savings, cooperative and other banks in each of the six countries for which there are complete financial data over a minimum of 18 years are included in the sample.⁴ The sample is an unbalanced panel of 885 banks and 17,827 bank-year observations. Table 1 provides summary statistics for ROA (net income after tax divided by total assets), size (total assets) and the capital ratio (equity divided by total assets). German (US) banks are least (most) profitable, with the exception of Germany (5%), all average capital ratios lie in the range of 8–11%.

Before carrying out the analysis, we test whether our data are stationary and test for unit roots in our panel data set. Both tests, the Im–Pesaran–Shin and Fischer-type tests, do not require balanced data sets and thus they are suitable for our unbalanced panel of observations.

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³See, for discussion, Cable and Mueller (2008).

⁴Banks from other countries are excluded because insufficient data are available.
Table 1. Summary statistics.

<table>
<thead>
<tr>
<th>Country</th>
<th>Banks</th>
<th>Obs.</th>
<th>Mean</th>
<th>SD</th>
<th>Total assets</th>
<th>Mean</th>
<th>SD</th>
<th>Capital ratio</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>104</td>
<td>2047</td>
<td>0.69</td>
<td>0.73</td>
<td>4.88e+07</td>
<td>2.51e+08</td>
<td>8.38</td>
<td>3.66</td>
<td>8.31</td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>112</td>
<td>2227</td>
<td>0.22</td>
<td>0.14</td>
<td>6769062</td>
<td>2.32e+07</td>
<td>4.96</td>
<td>1.90</td>
<td>10.78</td>
<td></td>
</tr>
<tr>
<td>Great Britain</td>
<td>107</td>
<td>2061</td>
<td>0.61</td>
<td>0.97</td>
<td>5.99e+07</td>
<td>2.90e+08</td>
<td>8.99</td>
<td>3.74</td>
<td>5.92</td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td>160</td>
<td>3072</td>
<td>0.68</td>
<td>0.53</td>
<td>3550129</td>
<td>1.80e+07</td>
<td>10.93</td>
<td>3.74</td>
<td>3.74</td>
<td></td>
</tr>
<tr>
<td>Switzerland</td>
<td>100</td>
<td>1974</td>
<td>0.60</td>
<td>0.65</td>
<td>2834133</td>
<td>1.17e+07</td>
<td>9.35</td>
<td>5.92</td>
<td>5.92</td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td>302</td>
<td>6446</td>
<td>0.30</td>
<td>0.71</td>
<td>2384133</td>
<td>1.82e+08</td>
<td>9.73</td>
<td>3.66</td>
<td>3.66</td>
<td></td>
</tr>
</tbody>
</table>

ROA is total net income after tax divided by total assets. Total assets are in the USD. Capital ratio is the ratio of equity to total assets.

bank data. Im, Pesaran, and Shin (2003) and Fischer-type (Choi 2001) tests have as the null hypothesis that all the panels contain a unit root.\(^5\) We test whether \(\pi_{it}\) contains a unit root for the six countries in our sample. Applying the Im–Pesaran–Shin test, we first consider the serially uncorrelated case, and the \(p\)-value is essentially zero for France, Germany, Great Britain, Switzerland and the United States. Thus, for these five countries, we strongly reject the null hypothesis that the bank profit data are non-stationary. For Italy, however, it is not possible to reject the null hypothesis for non-stationarity. Second, we test whether the \(\pi_{it}\) contain a unit root for the six countries in our sample allowing for serially correlated errors. The results stay the same. For the five countries stated above, we again reject the null hypothesis that the bank profit data are non-stationary. We also apply Fischer-type tests and perform a unit-root test on each panel’s series separately, then combining the \(p\)-values to obtain an overall test of whether the panel series contains a unit root. The tests for Germany, France, Great Britain and the United States strongly reject the null hypothesis for non-stationarity of profit data (\(p\)-value is essentially zero). For Switzerland, the results are mixed, and for Italy, again, we cannot reject the null hypothesis that profit data are non-stationary.

IV. Results

To remove variations in bank profits due to business cycle factors, the normalizing transformation presents annual bank profit as a deviation from the country mean profit rate for that year divided by this country mean profit rate. To reduce the effects of outliers, all variables are capped at the 1 and 99 percentiles of the distribution, and we report the regression results using this cut-off. We have also used other cut-offs, but our key results were not affected. Table 2 summarizes the results from estimating Equation (4) over the period 1993–2007 for five large Western European countries and the United States. The results are arrayed according to the magnitudes of the estimated long-run projected profits (\(\pi_{ip}\)). In all six countries, a majority of the banks had \(\pi_{ip}s < 0\), although US banks came close to a 50/50 split. Seventy per cent of British banks have \(\pi_{ip}s < 0\). Roughly two-thirds of the banks in France and Germany fell into this category.

Note that the mean \(\pi_{ip}s\) are negative for all six countries. If we assume that in the long-run bank profits converge on the competitive return on capital, then for the sample period in this study, the mean profit rates in each of the six countries must equal the competitive return on capital plus a positive rent.

The mean \(\lambda\)s in Table 1 are all below 0.4 except for Switzerland, which is consistent with previous work focusing on manufacturing. Thus, with the possible exception of Switzerland, the question of whether profits persist in the banking sectors of the six countries in our study revolves around the estimates of \(\pi_{ip}\).

Another way to assess how persistent profits differences are in each country is to regress our estimates of long-run projected profits (\(\pi_{ip}\)) on the initial deviation

\(^5\)We use command xtunitroot in Stata 14 to perform the Im–Pesaran–Shin and Fischer-type tests.
The long-run projected profit rate ($\pi_{ip}$) is the dependent variable. $\pi_{ip}$ is itself an estimated parameter, and thus, the observations in all equations are weighted with the inverse of the SE of $\pi_{ip}$. The coefficients. All coefficients are significant at the 0.01 level.

of a bank’s profits from the sample mean ($\pi_{i0}$), which we define as the average deviation over the first 3 years of our sample period, 1993–1995. The results are presented in Table 3.

All six coefficients on $\pi_{i0}$ are positive and significant. Five fall between zero and one. Thus, in these five countries, between 35% and 80% of the deviations of banks’ profits in the initial sample years are projected to persist indefinitely. The coefficient on $\pi_{i0}$ for Germany is 2.05. Thus, the deviations of banks’ profits from the sample mean for 1993–1995 are expected to double in magnitude over the long run. Since this coefficient seems inordinately large, we ran two more regressions, one for all banks with $\pi_{ip} > 0$ and other for banks with $\pi_{ip} < 0$. For the subsample of banks with $\pi_{ip} > 0$, the coefficient on $\pi_{i0}$ was 1.51, and for the subsample of banks with $\pi_{ip} < 0$, it was 1.87. Thus, over the period 1993–2007, unprofitable banks in Germany were predicted to become even more unprofitable, while the reverse was true for profitable banks.

V. Explaining differences in long-run projected profits

Studies of the persistence of profits in manufacturing have used several variables drawn from the industrial organization literature to explain differences across firms – firm market shares, industry concentration ratios, advertising, R&D and so on. First, several of these, like R&D, are not relevant for banks, and others are difficult to calculate. For example, some banks operate only in one or a few regions of a country, while others cover the whole country. To calculate meaningful market shares and concentration ratios for each bank, we would have to know the size of each bank’s market, which would be very difficult to measure. Second, our sample includes all banks in each of the six countries for which there are complete financial data over a minimum of 18 years. Variables like bank earning management and country regulation are not available for the whole studied period. For example, measures of country regulation are only recently calculated.

We thus begin by examining the effects of two variables, which have appeared in other studies of profit persistence in banking – bank size, measured as the natural log of total assets, ln(TA), and a bank’s capital ratio (CAP), measured as the ratio of total equity to total assets. We make no predictions about the signs of either variable. First, several studies using manufacturing firms have found firm size to be negatively correlated with $\pi_{ip}$, when firm market shares are controlled for. Since we do not control for market shares, ln(TA) could pick up a positive coefficient either because it is a crude measure of market share or because the more efficient banks grow to be larger. Second, the capital ratio is sort of the inverse of leverage and thus might be expected to have a negative coefficient, assuming that high leverage implies high risk, and thus high returns to offset the risk. High capital ratios may, however, also present barriers to entry into banking, implying a positive influence of capital ratios on long-run projected profits. On the other hand, high capital ratios might simply reflect a very efficient bank that did not need to issue much debt, also giving rise to a positive coefficient.

6The dependent variable $\pi_{ip}$ is a ratio of two estimated parameters, and its SE is calculated using the delta method. Since the dependent variable $\pi_{ip}$ is itself an estimated parameter, the observations in all equations are weighted with the inverse of the SE of $\pi_{ip}$.

7See, for example, Barth James, Caprio, and Levine (2013) presenting measures on regulation built on four surveys sponsored by the World Bank, the first survey in 1999 and the last survey in 2011.

8See, for example, Goddard et al. (2013).

9On the same vein, Berger (2000) argues that banks with a low capital-assets ratio have high costs of insurance against bankruptcy, assuming a positive relationship between bank capitalization and bank performance.
Table 4 presents the results. Four of the coefficients on the size variable are positive (significant for Switzerland and the United States). Two of the coefficients on size are negative and significant (France and Italy). In contrast, all six coefficients on the capitalization variable are positive and significant. These coefficients range in size, however, from 1.31 for Great Britain to 9.20 for Germany. Banks that display large capital ratios are persistently more profitable in all six countries, but the association of profitability and capital ratios varies dramatically across the six countries.

Our sample contains a variety of financial institutions that perform banking services. These can differ considerably. For example, savings banks are very important in some countries like Germany. They tend to serve local markets and do not engage in investment banking, consulting on mergers and other activities that large commercial banks engage in. Previous research has focused on the effects of different types of bank ownership on short-run profits. We have thus tested to see whether the type of financial institution in a country has an effect on the long-run profits’ persistence. Savings banks are numerically important in four of our six sample countries – Germany, Great Britain, Switzerland and the United States. In these four countries, we thus differentiated between commercial banks (Com) and savings banks (Save). In Italy, banking cooperatives (Coop) are the main alternative to commercial banks, while in France, it is state-controlled banks (State). Cooperatives are also fairly important in Germany. Our two control variables, size and capitalization, are also included in the equations. The variable, Other, includes all other forms of financial institutions in a country. The results appear in Table 5.

Capitalization continues to exhibit a strong positive relationship to projected long-run profits across the six countries. Bank size is only positive and significant for Switzerland, and even here, the coefficient is rather modest. For France, the coefficient on size is even negative and significant. Turning to the variables that differentiate the type of financial institution, we see that commercial banks have significantly higher projected profits in four of the six countries – Germany, Great Britain, Switzerland and the United States. For example, a typical German commercial bank is projected to have a 38% higher long-run profit rate than the average German bank. In the same four countries, savings banks have significantly lower projected profits than other financial institutions. Cooperative banks in Germany are projected to have somewhat higher long-run profits than other financial institutions, as do ‘Other’ banks in France. In Italy, the main categories of bank ownership are not significantly related to long-run profitability.

One general conclusion we can make is that commercial banks – maximizing profits as their stated intention – are indeed persistently more profitable than other banks in the long run. In contrast, savings banks – which might pursue other goals like providing credit to local communities and firms, i.e. social goals – show lower long-run projected profits.

### Table 4. Predicting long-run projected profits (π_{ip}) from 1993 to 2007

<table>
<thead>
<tr>
<th>Country</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>n</th>
<th>Adj. R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>0.85</td>
<td>−0.06</td>
<td>1.71</td>
<td>104</td>
<td>0.28</td>
</tr>
<tr>
<td>Germany</td>
<td>−1.69</td>
<td>0.05</td>
<td>9.20</td>
<td>112</td>
<td>0.28</td>
</tr>
<tr>
<td>Great Britain</td>
<td>2.28</td>
<td>1.38</td>
<td>6.32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td>1.92</td>
<td>0.44</td>
<td>2.44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switzerland</td>
<td>0.20</td>
<td>−0.04</td>
<td>3.72</td>
<td>160</td>
<td>0.27</td>
</tr>
<tr>
<td>United States</td>
<td>−0.67</td>
<td>0.01</td>
<td>1.31</td>
<td>107</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td>1.69</td>
<td>0.15</td>
<td>6.93</td>
<td>100</td>
<td>0.36</td>
</tr>
<tr>
<td></td>
<td>5.54</td>
<td>4.55</td>
<td>3.88</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The long-run projected profit rate (π_{ip}) is the dependent variable. π_{ip} is itself an estimated parameter, and thus, the observations in all equations are weighted with the inverse of the SE of π_{ip}. Statistics are below the coefficients.

---

11 Since the dependent variable π_{ip} is itself an estimated parameter, the observations in all equations are again weighted with the inverse of the SE of π_{ip}.

12 For example, Goddard, Molyneux, and Wilson (2004) examine a sample of commercial, savings and co-operative banks from five major European Union countries from 1992 to 1998 and find that the persistence of short-run profit appears higher for savings and co-operative banks than for commercial banks.

VI. Bank profitability persistence and the financial crisis

In this section, we take a look at the patterns of mean bank profit to asset ratios over the time period 1993–2014, focusing in particular on the impact of the financial crisis on bank profitability. Table 6 gives the sample means for each country...
and specific sub-periods before, during and after the financial crisis.

Before the crisis (1993–2007), we see that mean profit rates are largest in the United States (1.06%), smallest in Germany (0.23%) and fairly evenly distributed for the rest of the countries at around 0.7–0.8%. In the crisis year 2008 and thereafter, developments differ dramatically across the countries. While the Anglo-Saxon countries, Great Britain and the United States, experienced significant declines in profitability in the ‘immediate crisis years’ 2008 (GB: from 0.71% in 2007 to 0.24% in 2008) and 2008 and 2009 (United States: from 0.86% in 2007 to 0.35% in 2008 to 0.01% (!) in 2009),13 banks in the USA in particular recovered much faster than their European counterparts, reaching essentially pre-crisis profitability again in 2013–2014. In contrast, European banks – while not experiencing dramatic declines in profitability in the immediate crisis years – recovered much more slowly after the crisis or even suffered a ‘double-dip’ crisis like Italy (0.05% average ROA in 2013–2014). French banks appear to be an exception, weathering the crisis years fairly well. Thus, while banks in the United States appear to have returned to more or less their pre-crisis levels of profitability, banks in the other countries appear to be still struggling to adjust to the financial crisis that hit towards the end of 2007.

Table 7 tries to answer two questions of particular relevance. First, how the banks in the

13It appears that average bank profitability already began to decline in 2007 for the USA (from 1.09% in 2006 to 0.86% in 2007). For bank profitability in the USA in 2009, see also Lee and Rose (2010).
Table 7. Predicting profits during and after the financial crisis with long-run projected profits ($\pi_{ip}$) from 1993 to 2007 including bank ownership effects $\pi_{xy} = a + b\pi_{ip} + c\pi_{ip}Com + d\pi_{ip}Save + e\pi_{ip}Coop + f\pi_{ip}State + \varepsilon_{it}$.

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</tr>
</thead>
<tbody>
<tr>
<td>Cons</td>
<td>0.129</td>
<td>0.089</td>
<td>0.104</td>
<td>0.169</td>
<td>0.129</td>
<td>0.135</td>
<td>0.398</td>
<td>0.192</td>
<td>0.356</td>
</tr>
<tr>
<td>$\pi_{ip}$</td>
<td>1.060</td>
<td>1.837</td>
<td>1.508</td>
<td>0.670</td>
<td>0.707</td>
<td>0.531</td>
<td>-0.292</td>
<td>1.386</td>
<td>0.953</td>
</tr>
<tr>
<td>$\pi_{ip}$Com</td>
<td>4.29</td>
<td>5.88</td>
<td>5.17</td>
<td>2.25</td>
<td>2.20</td>
<td>1.87</td>
<td>-0.14</td>
<td>0.55</td>
<td>0.52</td>
</tr>
<tr>
<td>$\pi_{ip}$Save</td>
<td>-0.055</td>
<td>-1.036</td>
<td>-0.719</td>
<td>-0.108</td>
<td>-0.494</td>
<td>-0.988</td>
<td>3.742</td>
<td>-1.087</td>
<td>-0.037</td>
</tr>
<tr>
<td>$\pi_{ip}$Coop</td>
<td>-0.19</td>
<td>-2.88</td>
<td>-0.215</td>
<td>-0.22</td>
<td>-0.93</td>
<td>-2.25</td>
<td>1.72</td>
<td>-0.41</td>
<td>-0.02</td>
</tr>
<tr>
<td>$\pi_{ip}$State</td>
<td>0.530</td>
<td>0.156</td>
<td>0.460</td>
<td>1.48</td>
<td>0.40</td>
<td>1.36</td>
<td>0.95</td>
<td>-0.09</td>
<td>0.43</td>
</tr>
<tr>
<td>$\pi_{ip}State$</td>
<td>-0.631</td>
<td>-0.666</td>
<td>-0.542</td>
<td>0.20</td>
<td>0.11</td>
<td>0.19</td>
<td>0.20</td>
<td>0.01</td>
<td>0.04</td>
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<tr>
<td>No. of Obs.</td>
<td>104</td>
<td>104</td>
<td>98</td>
<td>112</td>
<td>112</td>
<td>107</td>
<td>105</td>
<td>105</td>
<td>98</td>
</tr>
<tr>
<td>Adj. $R^2$</td>
<td>0.42</td>
<td>0.36</td>
<td>0.35</td>
<td>0.22</td>
<td>0.11</td>
<td>0.01</td>
<td>0.15</td>
<td>0.90</td>
<td>0.69</td>
</tr>
</tbody>
</table>

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</tr>
</thead>
<tbody>
<tr>
<td>Cons</td>
<td>0.030</td>
<td>0.065</td>
<td>-0.046</td>
<td>0.088</td>
<td>0.166</td>
<td>0.192</td>
<td>0.017</td>
<td>0.057</td>
<td>0.030</td>
</tr>
<tr>
<td>$\pi_{ip}$</td>
<td>0.93</td>
<td>0.68</td>
<td>-0.15</td>
<td>1.07</td>
<td>2.30</td>
<td>2.43</td>
<td>0.05</td>
<td>0.90</td>
<td>0.69</td>
</tr>
<tr>
<td>$\pi_{ip}$Com</td>
<td>0.617</td>
<td>1.480</td>
<td>-1.936</td>
<td>0.589</td>
<td>0.227</td>
<td>0.146</td>
<td>9.449</td>
<td>3.000</td>
<td>0.145</td>
</tr>
<tr>
<td>$\pi_{ip}$Save</td>
<td>0.236</td>
<td>-0.045</td>
<td>1.813</td>
<td>0.744</td>
<td>0.473</td>
<td>0.070</td>
<td>-6.644</td>
<td>-2.042</td>
<td>0.663</td>
</tr>
<tr>
<td>$\pi_{ip}$Coop</td>
<td>0.44</td>
<td>-0.03</td>
<td>0.37</td>
<td>2.98</td>
<td>2.17</td>
<td>0.29</td>
<td>-1.92</td>
<td>-3.25</td>
<td>1.57</td>
</tr>
<tr>
<td>$\pi_{ip}$State</td>
<td>0.186</td>
<td>0.638</td>
<td>0.638</td>
<td>0.68</td>
<td>2.69</td>
<td>2.46</td>
<td>-8.041</td>
<td>-1.644</td>
<td>0.847</td>
</tr>
<tr>
<td>$\pi_{ip}Coop$</td>
<td>-0.208</td>
<td>-1.485</td>
<td>3.336</td>
<td>0.53</td>
<td>0.39</td>
<td>0.17</td>
<td>0.05</td>
<td>0.20</td>
<td>0.19</td>
</tr>
<tr>
<td>No. of Obs.</td>
<td>160</td>
<td>160</td>
<td>152</td>
<td>100</td>
<td>100</td>
<td>99</td>
<td>301</td>
<td>302</td>
<td>291</td>
</tr>
<tr>
<td>Adj. $R^2$</td>
<td>0.15</td>
<td>0.03</td>
<td>0.01</td>
<td>0.53</td>
<td>0.39</td>
<td>0.17</td>
<td>0.05</td>
<td>0.20</td>
<td>0.19</td>
</tr>
</tbody>
</table>

The dependent variable is the deviation of bank average ROA from the country mean profit rate for the periods 2008/2009, 2010–2012, 2013/2014, respectively, divided by this country mean profit rate in that period. $\pi_{ip}$ is the long-run projected profit rate. $\pi_{ip}X_{com}$, $\pi_{ip}X_{save}$ and $\pi_{ip}X_{state}$ are the interaction terms between $\pi_{ip}$ and bank ownership types. Main bank ownership types by countries are as follows. Germany: Com is a bank owned by other bank or financial company; Save is a savings bank; Coop is a bank cooperative. France: Com is a bank owned by other bank or financial company; State is a state-owned bank; Others includes unnamed shareholders or dispersed. Great Britain: Com is a bank owned by other bank or financial company; Save is a savings bank; Coop is a bank cooperative. France: Com is a bank owned by other bank or financial company; State is a state-owned bank; Others includes a variety of owners like foundation, industrial company and dispersed. Italy: Com is a bank owned by other bank or financial company; Save is a savings bank; Others includes a variety of owners like foundation, industrial company and dispersed. Switzerland: Com is a bank owned by other bank or financial company; Save is a savings bank; Others includes a variety of owners like foundation, industrial company and dispersed. United States: Com is a bank holding company, a bank owned by other bank or financial company; Save is a mutual savings bank; Others includes a variety of owners like employees, labour unions, state, foundation and dispersed. t-Statistics are below the coefficients.
different countries fared during and after the financial crisis, and second, how the different types of banks fared during and after the financial crisis. We analyse these questions by regressing bank profits during and after the financial crisis on our estimates of long-run projected profits from 1993 to 2007 and include bank ownership interaction terms with this long-run projected profits estimate. The dependent variable is the deviation of bank average ROA from the country mean profit rate for the periods 2008/2009, 2010–2012 and 2013/2014, respectively, divided by this country mean profit rate in that period. Thus, we answer the questions to which degree banks could retain their long-run profits from before the financial crisis during and after the financial crisis, and how long it took them to do so.

Consistent with the above summary statistics on average ROAs, French banks – with the possible exception of commercial French banks – were particularly ‘good’ in retaining before crisis profits during and after the crisis. The coefficient estimates on πip imply that even in the immediate post crisis years 2008/2009, French banks could retain entirely their long-run projected profits. By 2013–2014, they retain more profits than their long-run projected profits estimates would have suggested. The German and Italian banks in contrast retain only fractions (if at all) of their long-run projected profits during and after the crisis with no recovery in sight. In Germany, commercial banks (e.g. Deutsche Bank and Commerzbank) do particularly bad in recovering from the financial crisis. In Italy, the prolonged slump in bank profitability is still visible in the most recent period.14 In contrast, Swiss commercial banks until 2012 and Swiss savings banks from 2010 to 2014 managed to retain larger fractions of their long-run profits than other bank types in Switzerland. Estimates for Great Britain are insignificant, but point estimates for the last period indicate that UK banks managed to retain their projected long-run profits.

Results for the USA are particularly interesting. While commercial and savings banks in the United States did not retain a large share of their long-run projected profits in the immediate aftermath of the crisis, they managed to return to their long-run projections in the most recent period 2013–2014 to a large extent. The magnitudes and variability of estimates particularly in the first period indicate that the banking sector in the USA was out of equilibrium in the immediate after-crisis period. However, US banks very quickly managed to return to their long-run profit potential.

Recent studies report corroborating evidence. Weigand (2015) compares the performance of the 20 largest commercial banks in the USA and Europe from 2001 to 2013 and shows that US banks have higher profitability and loan quality than their European counterparts. Weigand (2013) reports that by the end of 2012, 15 of the 20 largest commercial banks in the USA posted record-setting revenues, with 12 of these banks also earning record profits. Schildback, Wenzel, and Speyer (2013) describe the growth in profits, revenues and loans of banks in the USA and Europe as ‘an ocean apart’. The study by Blanchard and Posen (2016) reveals that while the ratios of non-performing loans increased rapidly in both the United States and Euro areas from 2007 to 2009, the trends diverged radically from 2010 to 2014, with a rapid resolution of non-performing loans in the United States, while Euro area banks continued piling up bad debts.

Explaining the reasons behind the observed larger resilience and faster recovery of US banks compared to their European counterparts is beyond the scope of this article. One may, however, speculate that the faster resolution of crisis-related shocks in the USA than in Europe contributed to the faster recovery of US banks. First, macroeconomically, the US economy has been growing relatively steadily since 2010, and lending growth to nonfinancial corporations was high,

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14 This is consistent with recent case study evidence in the newspapers. The German banks Deutsche Bank and Commerzbank; the Italian bank Unicredit as well as other Italian banks are trading at all-time lows in 2016, while French and particularly US banks do much better. See, e.g. the newspaper article in the Frankfurter Allgemeine Zeitung (FAZ), ‘Europas Großbanken im Niedergang’ (‘European Large Banks in Decline’), http://www.faz.net/aktuell/finanzen/aktien/europaeische-bankaktien-weiter-im-freien-fall-14369079.html. In a ranking of banks according to profitability, capital ratios and market to book ratios, the Handelsblatt article ‘Gute Banken, Schlechte Banken’ (‘Good Banks, Bad Banks’) finds that French and British banks perform quite well, while German and Italian banks perform worst (see http://www.handelsblatt.com/unternehmen/banken-versicherungen/deutsche-bank-credit-suisse-hsbc-gute-banken-schlechte-banken/13988794.html).
while in Europe, output shows a double-dip recession and corporate lending growth was also characterized by a double-dip pattern. Second, in terms of monetary policy, the Federal Reserve has been much more aggressive than the European Central Bank (ECB) in intervening directly in financial markets. The Federal Reserve initiated or expanded numerous liquidity facilities during the financial crisis in accord with its lender-of-last-resort role. Third, in terms of regulatory policy, while there has been intense pressure on banks in both Europe and the United States since 2008 to raise capital levels, European banks were much more ‘leveraged’ than their US peers before the crisis. In our sample, in 2007, average capital ratios were as follows: the USA: 10.3%, Italy: 10%, Switzerland: 9.5%, France: 9%, Great Britain: 8.8% and Germany: 5.2%. In the post-financial crisis period, then, European banks had to increase capital much more by deleveraging (reducing their assets-to-equity ratio) and shrinking their business than they could by issuing new capital. Finally, it appears that in the United States, the government support measures for troubled banks have prioritized financial stability over banking competition. Thus, European banks may have faced more intensive competition than their US counterparts over the post-financial crisis period.

VII. Conclusions

This article examines the dynamics of bank profitability in the USA, Germany, Great Britain, France, Italy and Switzerland over the period 1993–2014. Our article contributes to the literature in at least two dimensions. First, we estimate the long-run projected profits in the banking industry in six major countries. Second, we study the determinants of the long-run projected bank profits.

We have presented evidence on the persistence of long-run bank profits in France, Germany, Great Britain, Italy, Switzerland and the United States over the period 1993–2014. There are great variations across the countries. Banks with large capital ratios are persistently more profitable in all six countries, but the association of profitability and capitalization varies dramatically across the six countries. There is little evidence of a link between bank size and the persistence of the long-run bank profits. We also show that commercial banks are persistently more profitable and savings banks are persistently less profitable in four of the six countries – Germany, Great Britain, Switzerland and the United States in 1993–2007. The effects of the financial crisis in 2008 differed dramatically across the countries as well as across ownership types. While banks in the United States experienced dramatic declines in the immediate aftermath of the crisis, they recovered much faster than their European counterparts and could essentially retain their long-run profit potential by the year 2014. In contrast and consistent with casual observation, German and Italian large banks retained only small fractions of their long-run projected profits in and after the financial crisis with no indications of their recovery in sight.

Our research has obvious limitations. The available financial data on banking were severely constrained to carry out broader cross-country study. Further research is needed to extend the financial data set including both more countries and more years. There remains more work to do in clarifying both why some banks are persistently profitable and the country variables that appear to affect bank profits.

Acknowledgments

This article was supported by the Jean Monnet Network action of the Erasmus+ Programme of the European Union grant (574547). The European Commission support for the production of this publication does not constitute endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

15See, for example, WIIW (2013).
16See, for example, Fleming (2012).
18Studies exploring the complex interactions between banking competition and financial stability in retail and commercial banking come to the conclusion that policy measures that strike an acceptable balance remain elusive (OECD 2011).
therein. We would like to thank Dennis C. Mueller for helpful comments.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

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