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Abhandlungen

Bank Profitability, Globalisation and Barriers to Entrepreneurship. A Panel Data Analysis for Europe and the United States (1999–2007)

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I. Introduction

The structure of this paper is as follows: Section 1 briefly reviews the commonly applied theories of banking profitability based on domestic factors in the main. Section 2 discusses the importance of corporate entrepreneurship, and section 3 studies the impact of globalisation on growth and profitability, showing the importance of international factors on banking profitability. This is followed by a model the results of *which* include our own conclusions.

1. Current Theories on Banking Profitability

A considerable part of the work done concerns the determinants of banking profitability, among which mention must be made of inflation (affecting profitability positively), the costs of capital (deposit rate affecting profitability negatively), the price of capital sold (lending rate affecting profitability positively), the costs of labour (salaries of bank employees) and of the rigidity of wages in particular making itself more strongly felt at lower levels of inflation (see: *Keynes* (1936); *Akerlof* et al. (1996, 2000); *Holden* (1994); *Wyplosz* (2001); *Toichiro Asada* et al. (2003)), as well as of many accounting and economic indices relating to profitability, efficiency, economic environment, ownership, etc. (see: *Molyneux/Thornton* (1992); *Demirguc-Kunt/Huizinga* (1999)).

Insofar as profitability (defined as the "return on equity (ROE) index" according to *Molyneux/Thornton* (1992)) is concerned, long term bond rates and concentration have a positive impact on ROE. Public ownership and money supply factors do not always matter, where the determination coefficient (R^2) is rather low yielding a low fit; in other words, this model does in fact provide a satisfactory explanation of profitability, which is

perhaps due to the non-homogenous sample of countries during the period under review (1986–1989). Besides, *Asli* et. al. (1999), who examined profitability by using the return on assets (ROA) index, concluded *that* for bank characteristics the coefficient of [equity $_t$ / total assets $_{t-1}$] is positive and statistically significant, that the coefficient of {[equity $_t$ / total assets $_{t-1}$] / GDP $_{t-1}$} is positive and statistically significant, that the coefficient of [credits / total assets] is negative and statistically significant, that the coefficient of [non-interest earning assets / total assets] is statistically not significant, that the coefficient of {[non-interest earning assets / total assets] / [GDP / head]} is negative and statistically significant, that the coefficient of {[short term loans + consumer loans] / total assets} is negative and statistically significant, that the coefficient of {[short term loans + consumer loans] / total assets} / [GDP / head]} is statistically not significant, that the coefficient of [overhead / total assets] and that the coefficient of {[overhead / total assets] / [GDP / head]} are negative and statistically significant, that the coefficient of the dummy [ownership] is positive and statistically significant and that the coefficient of the dummy {[ownership] / [GDP / head]} is negative and statistically significant. In the macroeconomic environment, the ratio [GDP / head] has a positive effect on profitability, while [the growth rate] does not matter. Furthermore, [inflation], [interest rates], as well as [real interest rates] have a positive impact on profitability. In taxation, [reserves] have a negative impact on profitability, but {[reserves] / [GDP / head]} do not matter. On the contrary, [the tax rate] has a positive impact on profitability, while {[the tax rate] / [GDP / head]} does not matter. For deposit insurance, the coefficient of [deposit insurance dummy] is statistically not significant.

It is worth noting that in macroeconomic terms bank interest rates follow the trend of long-term bond rates (*Lipsey R.* (1971)). Thus, a policy to reduce government deficits is in conflict with the policy to fight inflation.

Finally, various types of risks affect bank profitability. For instance, the risks of a sudden increase in short-term interest rate levels immediately increases deposit rates, but does not cause any quick increase in long-term interest rates (lending rates), which in turn reduce bank profits considerably (*Mishkin/Frederic* (1996)).

Finally, it should be noted that banking profitability is also studied from an efficiency point of view. Robust work on efficiency has been done by (*Berger* et. al. (1993)), examin bank efficiency as a whole (not at branch level). They examined a profit function of the Fuss normalized quadratic type. When profits are maximized the optimum quantity is estimated. The

statistical data taken from the Call Report (Report of Condition and Income) relate to annual banking data of commercial banks in the United States for the period 1984–1989. For each local region this data has been classified by unit banking (UNIT), limited banking (LIMIT), and statewide banking (STATE). This work has resulted in the definition of two variable outputs (business loans and consumer loans), two variable inputs (labour and purchased funds[1]), and two variable netputs (deposits higher than US$ 100,000 and physical capital). The study concludes that there is inefficiency in inputs and in outputs. Hence, half of the potential profits is lost. Another conclusion is that this inefficiency is mainly due to the technical sector. It is worth mentioning that the output inefficiency (mainly deficient revenues) is higher than the input inefficiency. The latter may perhaps be explained by the fact that regional laws restrict banks from expanding their operations beyond local regions, as well as by the fact that many companies which are not traditional banks enter the banking industry, resulting in capacity under-utilisation of the traditional banks (*Gorton/Rosen* (1992)). We note that in the United States the non-traditional companies offering business credit have increased their share in total credit as compared with the commercial banks (Federal Reserve Bulletin (1997)). Finally, it was found in the above study that large banks are more efficient than small ones, which is in agreement with the study of *Vennet* (2002).

2. *Entrepreneurship as a Source of Profits and Barriers on Entrepreneurship*

When viewing profitability from the entrepreneurial side, one can draw useful conclusions. *Georgiou* (2009a; 2010a) gives a good review on the impact of entrepreneurship on profitability and explains that barriers to entrepreneurship may (among other things) jeopardise profitability. The opinion that entrepreneurial caliber increases a firm's profitability is shared by (*Georgiou* (2009)), (*Lehmann* et al. (2007)) as well as by Kose and Yiming (2003) especially for the banking sector. Finally, according to (*Halkos/Georgiou* (2005)), banking profitability should not rely on sales increases for ever, but also on a better knowledge of market segments, which would reflect managerial skill. Hence, it is evident that any type of obstacle to entrepreneurship could hinder (among other things) a company's profitability (*Georgiou* (2009a)). There are various types of obstacles discouraging entrepreneurship, such as government legislation

[1] Higher than US$ 100,000.

on taxation (*Georgellis/Wall* (2002)); bureaucracy (*Berthold/Fehn* (2003)); market segmentation, inadequate information on technological progress, the labour market, and the money market (*Andersson* (2000)); inflation (*Bonini/Actuccar* (2006)). Besides, when opening a new business, European entrepreneurs face fewer obstacles than their counterparts in the United States (*Thurik/Grilo* (2005) p. 14), whilst the opposite is true when there is a need for keeping existing businesses afloat. Furthermore, the start-up costs of a company as well as the related regulations and legislation are discouraging (*Djankov* et al. (2002)). It is worth mentioning that businesses seeking to enter markets face various barriers depending on the plans of the most important companies already existing in the respective market (*Broadway/Trembley* (2005)).

Besides, the economic environment plays an important role in banking profitability, since it affects entrepreneurial plans. More specifically, the financial system in the post-communist countries is not yet as strongly developed as in the capitalistic countries, and this is regarded as a barrier to banking entrepreneurship (*Georgiou/Kyriazis* (2009)). According to (*Zouboulakis/Kyriazis* (2008)), entrepreneurship still faces many barriers indeed in the transition economies and especially in the Balkans, such as too high a percentage of agriculture in GDP, obsolete technology, too high energy consumption, unskilled labour, an unclear legal system, a lack of the spirit of competition, delays in attracting foreign investments. A similar problem exists in Eritrea's banking sector (*Georgiou* (2009b)).

3. The Impact of Globalisation on Growth

The impact of globalisation on the economy can be viewed in many ways. In macroeconomic terms, globalisation is assumed to have a positive impact on economic growth (increasing companies' profitability); this view is supported by (*Agarwal* et al. (2008)) and (*Georgiou* (2010b)), among others. An interesting review of actual macroeconomic impacts of globalisation is given by (*Spange/Young* (2007)). They are of the opinion that in the Western world globalisation is responsible for a shift to high-skilled labour-intensive services and has led to surpluses on current account, to dropping real wages for unskilled labour as distinct from skilled labour, and finally to relative rises of raw material *prices* and relative drops of final-goods prices.

Globalisation can also be considered from a microeconomic point of view (entrepreneurial side). In fact, as mentioned in section 2, barriers to

entrepreneurship hinder economic growth and reduce company profits. Besides, many economists maintain that banks contribute to economic growth and foster company profitability so that ultimately banks grow with industry (*Allen* et al. (2010)). Therefore, it would be of interest to examine the impact of globalisation on banking profitability.

To the best of our knowledge, globalisation as such has not been examined as a banking profitability determinant so far. The OECD, however, provides certain indices of globalisation (so far relating to companies only) which might be a handy tool for examining the impact of globalisation on banking profitability. The key idea of the present article is that, if corporations (as bank clients) are profitable in a globalised economic environment, banks (as lenders to corporations) are expected to be profitable too. Thus, our proposed model is a link between globalisation, barriers to corporate entrepreneurship and bank profitability. Hence, the contribution of the present paper is that bank profitability is examined for the western world, taking into account various globalisation indices (relating to companies) as indirect banking profitability determinants using a panel data econometric model. Our model is based on the microeconomic side (entrepreneurship), which is affected by changing globalisation conditions, as expressed by the OECD-provided indices (see next model).

With the above-mentioned findings in mind, it is easy to understand the importance of entrepreneurship as a criterion influencing a company's profitability in a new economic environment caused by globalisation. We all know that banks give loans to companies to help them grow as well as to enable them to export their products. In other words, banking profitability depends (among other things) on corporate profitability. Thus, it becomes apparent that banking profitability is a function, inter alia, of the entrepreneurial caliber of these companies, of their ability to face successfully various conditions such as barriers to entrepreneurship, globalisation, geographical concentration in trade, as well as FDI, which is explained in the model following hereafter.

II. The Model

Our model is expressed by equation (1).

$$\mathbf{Roe}_{it} = c_0 + c_1 \mathbf{Barrier1}_{it} + c_2 \mathbf{trGDP}_{it} + c_3 \mathbf{H}_{it} + c_4 \mathbf{FDI5}_{it} + \text{error}_{it} \tag{1}$$

Ex-ante: $c_1 < 0$; $c_2 > 0$

The variable [roe] stands for the average return on bank equity in each country. Each country is considered to represent one banking sector. This index shows profitability from the bank owners' (shareholders') point of view. Only the owners can decide either to expand or to close a bank. Thus, the index [roe] is highly appropriate. The data comes from the OECD. The following indices (shown on the right hand side of (1)) are used to measure the conditions and the environment in which corporate entrepreneurship functions. Hence, the left hand side of the equation (1) measures the banking profitability as a function of the environment in which companies (clients to banks) operate. At this point it should be mentioned that there are no specific indices for "banking globalisation" *per se*. Hence, our proposed model has a weakness for not using a "direct" index of banking globalisation. But for the moment it is the only information we have, and so we start the discussion from this basis. Thus, we try to link banking profitability to the conditions of the globalised environment in which corporate entrepreneurship (bank clients) operate. The variable [Barrier1] is an index denoting the barriers to corporate entrepreneurship (i. e. "regulatory and administrative opacity", "administrative burden on start-ups" as well as "barriers to competition") and is estimated by the OECD. The variable [trGDP] stands for the globalisation index defined as the ratio [trade to GDP] at current prices and exchange rates (again drawn from OECD data). The variable [H] is a second globalisation index and denotes the Herfindahl index of geographical concentration (trade of goods) at current prices and current exchange rates and is provided by the OECD. Finally, the variable [FDI5] is a third globalisation index and represents the FDI inflows (US$ millions, current prices and exchange rates) (5-year average) (data provided by UNCTAD). The five-year average is chosen to smoothen fluctuations in the annual FDI values. A five-year period is enough for an investment project to have a plant erected and production to get started. Data are annual and refer to country (i) in year (t). Our sample comprises a total of 105 observations and covers the following countries in alphabetical order for the period 1999–2007: Austria, Belgium (2002–2007), Denmark, Finland, Germany, Ireland, Italy, Netherlands, Norway, Spain, Sweden and the United States.

The method of GLS is used to handle heteroskedasticity, since, according to *Yaffee* (2003, p. 10), the estimation methods of "fixed effect" as well as "random effect" are not efficient for large samples when there is heteroskedasticity (either between time periods, or between cross sections). For equation (1) there are basically two types of estimation meth-

ods, the "fixed" and the "random" effect methods. The appropriate choice depends on whether one treats the constant terms a_i's as fixed numbers or as 'random drawings' from a specific distribution. As the correlation structure of the error term is ignored, a more efficient estimation method would be the Generalized Least Squares (GLS), provided that there is no correlation between the x's and the a's. GLS requires weighting the observations of y and x by $\Sigma^{-(1/2)}$:

$$\sum^{-1/2} = \frac{1}{\sigma}\left[I_T - \left(\frac{1-\sqrt{\vartheta}}{T} ii'\right)\right]$$

$$\text{where} \quad \theta = \frac{\sigma^2}{\sigma^2 + T\sigma_\alpha^2}$$

First one obtains an estimate $\boldsymbol{\theta}$ by estimating the equation:

$$y_{it} - y_{i.} = \beta'(x_{it} - x_{i.}) + (u_{it} - u_{i.}) \tag{2}$$

Once the component variances have been estimated, an estimator is derived from the composite residual covariance, and GLS transforms the dependent and regressor data (*Baltagi* (2001); *Davis* (2002)).

The detailed results are shown in table 1 and all diagnostic tests, based on *Halkos* (2003), are given in table 2. It can be seen that the estimated model (1) meets the three required criteria of homoskedasticity, specification and normality. Further, there is no serial correlation. In addition, since VIF is lower than 5, there is no multicollinearity (*Berka* (2007)) (see table 3). Hence, model (1) is robust., It can thus be seen that (*at 95%*) the coefficient of [barrier1] is negative and statistically significant, as initially assumed, under the assumptions of three estimation methods (GLS cross section SUR, GLS cross section weights and GLS Period weights). The coefficient of [trGDP] is positive and statistically significant, as initially assumed, though only under the assumptions of estimation method GLS cross section SUR. But, according to the assumptions of the estimation methods, GLS cross section weights and GLS period weights, this coefficient is statistically not significant. Furthermore, the coefficients of [H] and [FDI5] are statistically not significant under the assumptions of three estimation methods (GLS cross section SUR, GLS cross section weights and GLS Period weights).

III. Conclusions

The crux of the present article is that if corporations (as bank clients) are profitable in a globalised economic environment and if there are no barriers to entrepreneurship, banks (as lenders to these corporations) are expected to be profitable too. Thus, the model we propose is a link between globalisation, barriers to corporate entrepreneurship and bank profitability.

The structure of our present paper is based on micro as well as on macro theory. Concerning micro-economics, we agree that entrepreneurship creates company profits ultimately leading to economic growth (which reflects macro economic theory). Besides, globalisation leading to changes in the international macroeconomic environment also has an impact on entrepreneurial activities. Furthermore, globalisation, will give companies room for expansion and sales promotion, thus causing a higher value of trade to GDP. At the same time, at the micro level, entrepreneurial caliber may be expected to have thorough knowledge of market opportunities and to further increase profits. In other words, our paper demonstrates econometrically how the micro-economy and the macro-economy are interrelated.

The present paper empirically shows that a reduction in barriers to corporate entrepreneurship (as explained in sections 2 and 3) definitely has a positive impact on banking profitability, but globalisation (measured by the "trade to GDP" index) can have either a positive impact on banking profitability under certain assumptions concerning the estimation method, or no impact at all under certain assumptions concerning the estimation method. Finally, it is shown that the other two globalisation indices of geographical concentration (trade of goods) as well as FDI do not matter as far as banking profitability is concerned. In short, the empirical evidence shows that barriers to corporate entrepreneurship seem to be the most crucial factor for banking profitability, while globalisation measured by three different indices does not always play an important role regarding banking profitability determination.

These findings may be attributed to the fact that an entrepreneurship free of barriers can easily realize plans and promote growth. In turn, banks, as financial intermediaries, will easily grow and enjoy profits, since bank-clients are "financially-healthy" companies.

The contribution of the present paper is that it takes into account the international environment and, thus, the banking profitability model

does not rely exclusively on domestic factors. Moreover, the importance of entrepreneurship is also shown in the present model through the introduction of an index of barriers to entrepreneurship.

It should be noted that although the present model launches an interesting discussion on the links between globalisation, barriers to entrepreneurship and bank profitability, it cannot provide conclusive evidence, since either globalisation indices are not perfect or (and) estimated regression coefficients depend on the method of estimation. However, the present paper triggers further research on this topic.

Appendix

Table 1

Results

Method	*GLS cross section SUR*[(1)]	*GLS cross section weights*	*GLS Period weights*
c	0,138 *(8,72)*	0,138 *(6,59)*	0,121 *(4,89)*
Barrier1	–0,034 *(–5,10)*	–0,032 *(–2,69)*	–0,024 *(–2,21)*
trGDP	2,66E-04 *(2,87)*	1,53E-04 *(1,06)*	2,22E-04 *(1,36)*
H	0,016 *(0,13)*	0,152 *(0,46)*	0,065 *(0,25)*
FDI5	–1,37E-08 *(–0,15)*	1,21E-08 *(0,09)*	9,40E-08 *(1,04)*
Adjusted R^2	0,339	0,117	0,226
Durbin Watson	1,995	1,825	1,714[(2)]
Jarque – Bera	2,857	1,393	0,972

Note: For n = 105 (*at 95%*) d_L = 1,60383 and d_U = 1,76168.

(1) The term "SUR" does not refer at all to the term "seemingly unrelated regressions"; according to the manual of Eviews the term "SUR" is used only because it applies for the covariance estimation the same formula as for the estimation of "seemingly unrelated regressions".

(2) *Rho* = 0,04286 (t = 0,43).

Table 2

Diagnostic Tests[2]

TESTS	*GLS cross section SUR*	*GLS cross section weights*	*GLS Period weights*	*Critical Values (at 95%)*
1) Heteroskedasticity	0,697	0,604	0,478	2,460
2) Heteroskedasticity	0,865	0,722	0,471	2,460
3) Heteroskedasticity	0,475	0,009	0,128	3,841
4) Heteroskedasticity	2,607	5,481	3,232	5,991
5) Heteroskedasticity	2,273	2,936	2,144	7,815
6) $RESET_1$	0,707	0,669	0,022	3,841
7) $RESET_2$	0,501	0,498	0,005	5,991
8) $RESET_3$	0,330	0,348	2,582E-05	7,815
9) Normality	2,857	1,393	0,972	5,991

Note:
Test 1: Regression of the squared residuals on X. That is, $u_t^2 = x_t' \gamma_1 + v_{t,1}$
Test 2: Regression of absolute residuals on X. That is, $|u_t| = x_t' \gamma_2 + v_{t,2}$ (a Glejser test)
Test 3: Regression of the squared residuals on $\hat{Y}$
Test 4: Regression of the squared residuals on $\hat{Y}$ and $\hat{Y}^2$
Test 5: Regression of the log of squared residuals on X (a Harvey test)
Test 6: Regression of residuals on $\hat{Y}^2$
Test 7: Regression of residuals on $\hat{Y}^3$
Test 8: Regression of residuals on $\hat{Y}^4$
Test 9: Normality test (Jarque Bera).

Table 3

VIF

Barrier1	*trGDP*	*H*	*FDI5*
1,07	1,84	1,44	1,31

[2] These tests are based on *Halkos* (2003).

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Summary

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The crux of the present article is that if corporations (as bank clients) are profitable in a globalised economic environment and there are no barriers to entrepreneurship, banks (as lenders to these corporations) are expected to be profitable too. Thus, our proposed model is a link between globalisation, barriers to corporate entrepreneurship and bank profitability. In the present paper it is empirically shown that a reduction in barriers to corporate entrepreneurship definitely has a positive impact on banking profitability, but globalisation (measured by the "trade to GDP" index) can have either a positive impact on banking profitability under certain assumptions concerning the estimation method, or no impact at all under certain assumptions concerning the estimation method. Finally, it is shown that the other two globalisation indices – geographical concentration (trade of goods) as well as FDI – do not matter as far as banking profitability is concerned. In short, the empirical evidence shows that barriers to corporate entrepreneurship seem to be the most crucial factor for banking profitability, while globalisation measured by three different indices does not always play an important role regarding banking profitability determination. The sample covers many European countries, as well as the United States. The econometric model estimation using panel data is made feasible through the Eviews software package. It should be noted that although the present model launches an interesting discussion on the links between globalisation, barriers to entrepreneurship and bank profitability, it cannot provide conclusive evidence, since either globalisation indices are not perfect or (and) estimated regression coefficients depend on the method of estimation. However, the present paper triggers further research on this topic. (JEL L26, G3, O4, C23, G21)

Zusammenfassung

Die Rentabilität von Banken, Globalisierung und Beschränkungen des Unternehmertums – Eine Analyse von Paneldaten für Europa und die Vereinigten Staaten (1999–2007)

Die Crux dieses Artikels liegt darin, dass, wenn Unternehmen (als Bankkunden) in einem globalisierten Wirtschaftsumfeld rentabel sind und es keine Beschränkungen des Unternehmertums gibt, man davon ausgehen darf, dass Banken (als Kreditgeber dieser Unternehmen) ebenfalls rentabel sind. Somit stellt das von uns vorgeschlagene Modell ein Bindeglied zwischen Globalisierung, Beschränkungen des Unternehmertums und Rentabilität von Banken dar. Dieser Artikel enthält den empirischen Beweis, dass eine Absenkung des Niveaus von Beschränkungen

des Unternehmertums definitiv eine positive Wirkung auf die Rentabilität von Banken ausübt, jedoch auch, dass die Globalisierung (gemessen als Anteil des Handels am Bruttoinlandsprodukt („trade to GDP-Index")) unter gewissen Annahmen hinsichtlich der Schätzmethode entweder eine positive Wirkung auf die Rentabilität von Banken haben oder sich gar nicht auswirken kann. Schließlich wird gezeigt, dass zwei weitere Globalisierungsindizes – geografische Konzentration (Warenhandel) und ausländische Direktinvestitionen (FDI) – von keinerlei Bedeutung für die Rentabilität von Banken sind. Kurz gesagt: die empirischen Beweise zeigen, dass Beschränkungen des Unternehmertums für die Rentabilität von Banken der ausschlaggebende Faktor für ihre Rentabilität zu sein scheinen, wohingegen die auf der Grundlage von drei unterschiedlichen Indizes gemessene Globalisierung nicht immer eine wichtige Rolle für die Bestimmung der Rentabilität von Banken spielt. Die Stichprobe umfasst eine Reihe europäischer Staaten sowie die Vereinigten Staaten von Amerika. Die Schätzung eines ökonometrischen Modells auf der Grundlage von Paneldaten wird durch das Eviews-Softwarepaket ermöglicht. Es sollte zur Kenntnis genommen werden, dass, obgleich dieses Modell den Anlass für eine interessante Diskussion über die Bindeglieder zwischen Globalisierung, Beschränkungen des Unternehmertums und die Rentabilität von Banken gibt, es keine schlüssigen Beweise liefern kann, da beide Globalisierungsindizes nicht perfekt sind oder (und) geschätzte Regressionskoeffizienten von der Schätzmethode abhängen. Aber dieser Beitrag stellt einen Anlass für weitere Forschungsarbeiten zu diesem Thema dar. (JEL L26, G3, O4, C23, G21)