



Department of
Economics and Finance

Working Paper No. 12-12

Economics and Finance Working Paper Series

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September 2012

<http://www.brunel.ac.uk/economics>

Financial Freedom and Bank Efficiency: Evidence from the European Union

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Abstract

This paper investigates the dynamics between the financial freedom counterparts of the economic freedom index drawn from the Heritage Foundation database and bank efficiency levels. We rely on a large sample of commercial banks operating in the 27 European Union member states over the 2000s. After estimating bank-specific efficiency scores using Data Envelopment Analysis (DEA), we develop a truncated regression model combined with bootstrapped confidence intervals to test our main hypotheses. Results suggest that the higher the degree of an economy's financial freedom, the higher the benefits for banks in terms of cost advantages and overall efficiency. Our results also show that the effects of financial freedom on bank efficiency tend to be more pronounced in countries with freer political systems in which governments formulate and implement sound policies and higher quality governance.

JEL classification: C1, G21, G28, P50.

Keywords: Economic Freedom Indexes; Bank Efficiency; Data Envelopment Analysis; Truncated Regression; Bootstrap.

Acknowledgements: We thank participants at the April 2011 Annual meeting of the *European Public Choice Society* (Rennes, France) for insightful comments. Previous versions of this research have also been presented at the University of Sussex and Brunel University

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1. Introduction

Recent research in banking is increasingly using the indexes of “economic freedom” as explanatory variables in regressions that consider various aspects of bank performance in general (e.g., Demirguc-Kunt et al., 2004) and bank efficiency specifically (e.g., Chortareas et al., 2011). There exists indeed a powerful rationale for doing so, and the view that the liberty of individuals to pursue their economic goals leads to efficient outcomes is as old as the economics science itself. The development of quantitative indexes of economic freedom over the last two decades allowed to explicitly analyze the effects of liberal economic institutions (or the lack of them) on various aspects of economic performance. Nevertheless, in the banking literature the indexes of economic freedom have been used only as control variables and/or have been inaccurately interpreted as regulation indexes. Moreover, the recent financial crisis revealed fundamental weaknesses in the regulatory framework of financial institutions. Different analysts and policymakers attribute the recent travails of the financial industry to too little, too much, or inappropriate regulation¹ with a consensus being formed toward stronger and new forms² of regulation. An emerging question in the midst of this debate is if and how economic and financial freedom may affect the performance of financial institutions.

This paper constitutes the first attempt, to our knowledge, to explicitly characterize the effects of “financial freedom” indexes on bank efficiency, controlling for the banking, economic, and institutional variables that one typically encounters in financial literature. We focus explicitly on the financial counterparts of the economic freedom indexes and we distinguish between the concepts of financial freedom and regulation. Our analysis can also be interpreted as a robustness check of the

¹ For example, recall the failure of the Financial Crisis Inquiry Commission (henceforth, FCIC) to reach a consensus and the presence of two dissenting views (FCIC, 2011).

² E.g., HM Treasury (2011).

constructed freedom indexes themselves. Banks that operate under a high degree of financial freedom and fail to display, *ceteris paribus*, higher levels of productive efficiency would be in contrast with basic tenets of economic theory.

We obtain efficiency scores for banks operating in 27 European Union (EU) countries using Data Envelopment Analysis (DEA) over the period 2001-2009, utilizing 6,744 bank observations. We then regress the efficiency estimates on the financial/economic freedom indexes from the Heritage Foundation (2010), which aim at capturing the “greater independence in financial and banking markets from government control”. We employ the Simar and Wilson’s (2007) truncated regression model combined with bootstrapped confidence intervals and we carry out a sensitivity analysis for robustness using a fractional logit estimator. Our analysis controls for bank-specific variables accounting for financial strength, relative size of the institutions and a proxy for credit risk. In addition, we consider institutional variables to account for government quality.

The rationale for the hypothesized relationship between financial freedom and bank efficiency is straightforward: the less are the constraints faced by financial institutions on how to manage their business the more effective they should be in controlling their costs, thus resulting in a more efficient resources allocation process.³ Our focus is on the commercial banking business rather than on the activities of large complex financial institutions. Moreover, our interest is confined explicitly on a specific bank performance measure, i.e., $\ln(\text{ROA}_{it})$.

global and European crises. This dimens

The remaining of the paper is organized as follows: Section 2 reviews the literature on the economic and financial freedom indexes and its potential relationship

common law, creditor rights, rule of law and find that countries with more robust investor protection (where agency costs are restricted by the law) have larger capital markets. The “rule of law” has been also used to capture the effects of severe enforcement practices for any given level of creditors or shareholders’ protection. In contrast, Fries and Taci (2005) consider the role of banking sector reform and liberalization in the transition countries to capture the effect on bank cost efficiency. The key explanatory variable of interest is an index of banking sector reform published by the European Bank for Reconstruction and Development (EBRD) Transition Reports. Their results show that progress in banking reform is significantly associated with a decrease in banks’ costs.

Focusing on the impact of regulatory and supervisory restrictions, Demirguc-Kunt et al. (2004) find that regulatory restrictions on banking activities are associated with higher level of interest margins. Other studies argue that more openness in the banking markets, in terms of increased foreign penetration, reduces bank margins and improve the efficiency of the banking systems (Clarke et al., 2000; Claessens et al., 2001). Barth et al. (2006) examine bank regulation using data from more than 150 countries and conclude that strengthening capital standards or empowering supervisors does not boost bank performance, reduce corruption in lending, or lower banking system fragility. Other recent studies focusing on the relationship between regulatory restrictions and bank efficiency measured with frontier methods include Grigorian and Manole (2002) and Pasiouras et al. (2009). Similarly, evidence produced by Chortareas et al. (2012) indicates that the effect of banking regulation and supervision on bank performance appears to change with the type of regulation.

The main rationale for government’s involvement in the financial sector relies on the “market failure” approach which postulates that various imperfections prevent

competitive markets from delivering the most efficient outcomes.⁵ Information asymmetries (e.g., Stiglitz, 2002) play an important role among these imperfections. Government intervention is often justified in order to prevent the development of monopoly power and excessive risk taking by banks (e.g., Freixas and Santomero, 2004). On the other side of this debate stand the views that emphasize the failure of the state/government. Greater independence of banks from government control allows the bank boards to be accountable to their shareholders while limited financial freedom can distort the incentives of bankers' boards that are accountable to government bodies and strive to meet particular government imposed regulations.

Similar debates have reemerged in the aftermath of the 2007-09 global financial crisis on various issues, including regulation, capital requirements, and government interference in the financial industry. One approach points to the deregulation of financial services and institutions as a fundamental reason that led to the crisis, while other approaches suggest that the seeds of the crisis were sown by a particular set of regulations rather than deregulation per se. Moreover, limited financial freedom may have encouraged financial institutions to create opaque new instruments and miscalculate risk. The current debate, in the context of the European crisis raises issues such whether the eurozone needs further centralization of banking supervision leading to a "banking union" with a centralized regulator and a eurozone-wide deposit insurance.

Overall, only a relatively limited number of studies use economic freedom indexes among several other control variables in the analysis of banking efficiency (e.g. Demirguc-Kunt et al., 2004; Chortareas et al., 2011). The main focus of these studies, however, is on the banks' institutional and regulatory environment. To our

⁵ This rational permeates, for example, the Turner Review (2009), produced by the UK's Financial Services Authority in response to the Chancellor's of the Exchequer request.

Data for the economic freedom are collected from the Heritage Foundation (2010) and data on the institutional and governance quality are drawn from the World Bank database by Kaufmann et al. (2010). There exist two major attempts to measure economic freedom producing the corresponding indexes, namely the *Economic Freedom of the World* Annual Reports produced by the Fraser Institute and the *Index*

efficiency scores. In the second stage the DEA efficiency scores are regressed against a variety of economic freedom and other bank-specific and institutional control variables.

The DEA approach employs a linear programming framework and makes some fairly general assumptions about the underlying production technology (Ray, 2004) to yield an estimate of the Farrell's efficiency measure (1957) for each bank in a given sample. In this paper, we employ an input-oriented DEA model with variable returns to scale (VRS), which allows for the possibility that the production technology of banks in the sample may exhibit increasing, constant, or decreasing returns to scale (Banker et al. 1984).⁷

Banks' efficiencies are measured relative to a common frontier by pooling the data across countries estimated separately for each year. This approach allows us to estimate efficiency differentials not only

$$EFF_{i,k} = \beta_1 H_i + \beta_2 B_{i,k} + \beta_3 YEAR_t + \epsilon_{i,k} \quad (1a)$$

$$EFF_{i,k} = \beta_1 FINFREE_i + \beta_2 B_{i,k} + \beta_3 I_i + \beta_4 YEAR_t + \epsilon_{i,k} \quad (1b)$$

where i indexes country i , k indexes bank k , H_i is a vector of economic freedom indicators in country i , $B_{i,k}$ is a vector of bank-specific characteristics for each bank k in country i , I_i is a vector of governance indicators in country i , $YEAR_t$ is a yearly dummy variable controlling inter alia for other macroeconomic and technical changes, and $\epsilon_{i,k}$ is the error term. The dependent variable EFF is the managerial efficiency measure, measuring how far the bank is from the estimated efficient frontier.⁸ Equation (1b) includes the financial freedom variable ($FINFREE$) as well as the governance variable (I).

As a sensitivity analysis, we also estimate equations (1a and 1b) using Papke and Wooldridge's (1996) fractional logit estimator (discussed below).

The data for the variables accounting for economic freedom (variables in vector H_i of equations 1a and 1b) are obtained from the

efficiency (Miller and Holmes, 2010). The Business Freedom variable (BUSINESS) is a proxy of the ability to establish and run a business without interference from the government. Burdensome and redundant regulatory rules are the most common barriers to the free conduct of business activities. Finally, the economic freedom index variable (INDEX), is an aggregate measure of a country's overall economic freedom from 10 different viewpoints. The economic freedom indicators take values in a scale from 0 to 100, where higher values indicating an economic environment or set of policies that is most conducive to economic freedom.

The regression specifications in equations (1a and 1b) account for bank-specific $B_{i,k}$ control variables; while equation (1b) further includes country-specific I_i institutional control variables as a robustness check. The corresponding vectors are defined as follows:

$$i,k \quad (\quad i,k \quad , \quad i,k \quad , \quad i,k \quad ,$$

The vector of institutional control variables, I_i , in the efficiency equation (4) includes the following variables from Kaufman et al. (2010) dataset on institutional development: voice and accountability (VOICE), political stability (STABILITY), government effectiveness (GOVERN), regulatory quality (REG), rule of law (LAW) and control of corruption (CORR). The six governance indicators are measured in units ranging from about -2.5 to 2.5, with higher values corresponding to better governance outcomes. Finally, the set of YEAR dummy variables in equations (1a and 1b) controls, inter alia, for other macroeconomic, regulatory and technological changes in the economy. Table 3 reports the descriptive statistics for the variables employed in the model. The Table shows average efficiency scores of about 72%, thus suggesting that banks have considerable scope for reducing wasted inputs while at the same time increasing desirable output

<Insert Table 3 about here>

4. Results

4.1 Financial freedom and bank efficiency

To consider to what extent economic and financial freedom affect the efficient operation of banks, we regress the estimated efficiency scores on economic freedom indexes along with a selection of bank-specific and institutional variables. Equations (1a and 1b) are estimated using Simar and Wilson's (2007) truncated regression model and confidence intervals are computed using 2000 bootstrap replications.

Tables 4 and 5 report the parameter estimates and their bootstrapped confidence intervals.

<Insert Tables 4 and 5 about here>

provided by Barth et al. (2006), that greater controls may hinder bank performance.⁹ Therefore, our evidence broadly suggests that policies that constrain banks' degree of financial freedom may result in an inefficient resources allocation process. This corroborates previous findings showing that regulatory restrictions tend to boost interest margins, for 72 countries around the globe (Demirguc-Kunt, et al., 2004).

The results also document a strong link between bank efficiency and government spending, property rights, freedom from corruption and business freedom. Banks in countries where the overall environment is conducive to the protection of the private sector property rights and the financial system is characterized by relatively high levels of openness tend to have higher efficiency levels. Put it differently, all coefficient estimates for the Heritage Foundation variables describing the country's financial environment indicate a positive and statistically significant relationship at the 1% level. Moreover, our results suggest that a strong negative relationship between government spending and efficiency exists, implying that excessive government spending often leads to inefficiency, possibly through the channels of bureaucracy, waste, and lower productivity.

Table 5 shows the result from the estimation of equation (1b) which focuses on the relationship between efficiency and financial freedom, taking explicitly into account the governance and institutional settings. We conduct six regressions used as additional robustness checks for the obtained results. We consider the financial freedom along with selected institutional environment variables – such as the voice and accountability (VOICE), political

regressions based on equation (1a). In general, economic freedom and better institutional quality allow for more

ability of the government to formulate and implement sound policies and regulations

institutional variables across all models,

Given their scope, the indexes of economic freedom have been criticized of incorporating a degree of ideological bias. But even if this is the case, as Ashby and Sobel (2008) observe, they measure indeed what they are supposed to measure. In one sense, our analysis puts the very consistency of the constructed freedom indexes in the microscope, operating as a control for their validity. If banks that enjoy a high degree of economic/financial freedom were characterized by poor efficiency performance, *ceteris paribus* for the effects of banking and institutional variables, and under the typical assumptions of the neoclassical analytical framework, it would possibly imply flaws in the measurement of the freedom index (or in the assumptions underplaying the economic model).

5. Conclusions

This paper contributes to the existing literature by focusing on the relationship between the different components of the economic freedom indexes on the efficient operations of banks. Our main focus is on the index of financial freedom that measures an economy's banking system effectiveness as well as independence from government control and interference in the financial sector. We first produce DEA efficiency scores for 6,744 bank observations operating in 27 European countries between 2001 and 2009. Then, we use a robust bootstrap procedure to regress the first-stage efficiency scores on economic freedom indexes, while controlling for governance indicators and bank specific characteristics. In addition, we carry out a sensitivity analysis for robustness using a fractional logit estimator.

The results show that a clear positive association between the financial counterparts of the economic freedom indexes and the bank efficiency measures exist. This suggests that excessive government interference in the financial institutions

activities may adversely affect the efficient operation of banks. Banks operating in countries characterized by a high degree of economic and financial freedom and good

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Table 1
Time and size distribution of EU-27 banks

Year	Number of obs.	Asset size (€million)		
		Mean	Median	St.Dev.
2001	813	8,907.6	776.8	45,488.1
2002	791	8,657.2	768.3	42,821.8
2003	764	9,939.6	761.2	47,338.7
2004	708	10,368.7	970.2	51,645.9
2005	921	11,522.8	981.4	66,524.2
2006	836	13,157.9	1,174.9	73,641.4
2007	834	14,643.1	1,352.0	84,656.5
2008	765	19,849.5	1,421.3	116,134.0
2009	312	24,005.6	1,823.9	104,326.6
Average	749			
Total	6,744			

Source: Bankscope.

Table 2
Bank inputs and outputs (€million)

Variable	Mean		St.Dev.		Median	
	2001	2009	2001	2009	2001	2009
<i>Inputs</i>						
Personnel expenses		75.5				

Table 3. Descriptive statistics for the variables employed in the cross sectional regressions: Mean, Median and Standard Deviations for 2001-2009^a

Symbol	Definition	Mean	St.Dev.	Median
EFF	Data Envelopment Analysis (DEA) efficiency scores	0.72	0.22	0.73
<i>Economic Freedom Variables</i>				
FINFREE	Financial Freedom	66.97	15.06	70.00
GOVERNEXP	Government Spending	33.32	16.00	31.70
PROPERTY	Property Rights	75.38	16.62	70.00
CORRFREE	Freedom from Corruption	68.08	17.96	71.00
BUSINESS	Business Freedom	77.06	9.98	70.30
INDEX	Index of Economic Freedom	67.74	6.43	68.10
<i>Bank-Specific Control Variables</i>				
EQAS	Shareholder's Equity / Total Assets	10.36	9.23	7.87
ROAE	Return on Average Equity	7.93	22.36	8.15
LNTA	Logarithm of Total Assets	9.56	3.61	8.44
CR	Total Loans / Total Assets	0.50	0.27	0.53
<i>Institutional Control Variables</i>				
VOICE	Voice and Accountability	1.25	0.27	1.30
STABILITY	Political Stability	0.83	0.34	0.82
GOVERN	Government Effectiveness	1.35	0.57	1.52
REG	Regulatory Quality	1.29	0.37	1.28
LAW	Rule of Law	1.25	0.54	1.38
CORR	Control of Corruption	1.31	0.70	1.41

^a All financial variables measured in millions Euros.

Sources: The Heritage Foundation and Down Jones & Company, Inc., (2010); Governance Matters (Kaufman et al., 2010); Bankscope and own calculations.

Table 4. Truncated regression analysis using equation (1a)

Table 5. Truncated regression analysis using equation (1b)**Years: 2001-2009**

Dep.Var.: EFF	(1)	(2)	(3)	(4)	(5)	(6)
Financial Freedom						
FINFREE	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
Bank Specific variables						
EQAS	0.001*	0.001*	0.001*	0.001*	0.001	0.001
ROAE	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
LNTA	0.035***	0.036***	0.035***	0.036***	0.035***	0.036***
CR	0.156***	0.155***	0.155***	0.157***	0.154***	0.153***
Institutional variables						
VOICE	0.070***	-	-	-	-	-
STABILITY	-	0.038**	-	-	-	-
GOVERN	-	-	0.033***	-	-	-
REG	-	-	-	0.050***	-	-
LAW	-	-	-	-	0.020***	-
CORR	-	-	-	-	-	0.015***
Constant	-0.010***	0.023***	0.026***	0.019***	0.034***	0.037***
Year Dummies	YES	YES	YES	YES	YES	YES
Observations	6744	6744	6744	6744	6744	6744
Number of Countries	27	27	27	27	27	27

Table 6. QMLE analysis using equation (1a)

Years: 2001-2009

Dep.Var.: EFF	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Economic Freedom variables							
FINFREE	0.006***	-	-	-	-	-	0.007***
GOVERNEXP	-	-0.005***	-	-	-	-	-0.005***

Table 7. QMLE analysis using equation (1b)

Years: 2001-2009						
Dep.Var.: EFF	(1)	(2)	(3)	(4)	(5)	(6)
Financial Freedom						
FINFREE	0.005***	0.006***	0.005***	0.004***	0.006***	0.006***
Bank Specific variables						
EQAS	0.016***	0.017***	0.017***	0.017***	0.016***	0.016***
ROAE	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***
LNTA	0.177***	0.178***	0.177***	0.178***	0.178***	0.178***
CR	0.358***	0.352***	0.357***	0.365***	0.353***	0.349***
Institutional variables						
VOICE	0.210***	-	-	-	-	-
STABILITY	-	0.089**	-	-	-	-
GOVERN	-	-	0.109***	-	-	-
REG	-	-	-	0.181***	-	-
LAW	-	-	-	-	0.060**	-
CORR	-	-	-	-	-	0.040**
Constant	-2.383***	-2.259***	-2.285***	-2.317***	-2.246***	-2.231***
Year Dummies	YES	YES	YES	YES	YES	YES
Observations	6744	6744	6744	6744	6744	6744
Number of Countries	27	27	27	27	27	27

Note: FINFREE= Financial Freedom, EQAS= Equity/Assets, ROAE= Return on Average Equity, LNTA= LN of Total Assets, CR= Total Loans/Total Assets, VOICE= Voice and Accountability, STABILITY= Political Stability, GOVERN= Government Effectiveness, REG= Regulatory Quality, LAW= Rule of Law, CORR= Control of Corruption, Constant= constant term.

Estimated using Papke and Wooldridge (1996) Quasi-Likelihood estimation method.

*p<0.1 Significance from zero at the 10% level.

**p<0.05 Significance from zero at the 5% level.

***p<0.01 Significance from zero at the 1% level.