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RESEARCH ARTICLE

Après le déluge: Institutions, the Global Financial Crisis, and Bank Profitability in Transition

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Abstract While the determinants of bank profitability have been well-explored, the influence of institutions on bank performance is less understood, especially in the transition context. Given the presence of a financial crisis such as the one that struck the global economy from 2007 onward, did the underlying institutional structure of a country help to mitigate the effects of the crisis on banks? Utilizing a new database of 1600 banks across 30 transition economies, this paper applies Bayesian model averaging, fixed-effects, and IV-GMM methodology to test the effect of institutions on bank profitability in a crisis period. Results are conclusive across models that investor-specific property rights aided bank profitability during the crisis. The effect of democracy on banks is much more ambiguous but appears to negatively influence profitability indirectly through interest group channels and bank concentration. These results hold across a variety of specifications and robustness tests.

Keywords Institutions · Bank profitability · Return on assets · Transition economies · Bayesian model averaging

JEL Classification G21 · P26 · E58

1 Introduction

The question of the drivers of bank profitability is a well-studied one in economics and finance, with papers from Bourke (1989) to Flamini et al. (2009) approaching the analysis from a panel perspective. From this vast literature, a consensus has formed on broadly the most important factors regarding bank profitability, focusing on bank- or

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industry-specific factors, or the broader macroeconomic conditions prevailing in a country.

Arrayed against this literature is a relatively more recent foray by some authors into researching country-level institutional factors that may drive bank profitability. Papers such as Beck and Levine (2005), Akitoby and Stratmann (2010), and Beltratti and Stulz (2012) argue for the powerful influence of various institutions on the path of financial sector development, as well as affecting the outcomes generated by financial institutions. This research on institutions and profitability has thus far concentrated on either single countries (such as Athanasoglou et al. (2008) on Greece and Dietrich and Wanzenried (2011) on Switzerland) or on widely dispersed and heterogeneous samples, as with Demirgüç-Kunt et al. (2004), who examine banks from 72 countries over the period from 1995 to 1999.

However, the impact of institutions on profitability may be different in a particular set of countries *vis a vis* another group. For example, in developed countries such as the US or Singapore, the institutional environment may be less important for banking performance, mainly due to the fact that the institutions in these countries are very stable (one of the traits comprising an "institution" being this notion of semi-permanence). But what of other countries, where the institutional framework is either incipient or in a state of flux? What if the institutional framework is merely two decades old and still has not attained levels seen in Canada or Australia?

This scenario is precisely the case in the transition countries of Central and Eastern Europe (CEE) and the former Soviet Union (FSU), which have put in place broader market frameworks in a comparatively shorter period of time. Even given their heterogeneous nature after 25 years of transition, these countries continue to share the experience of recent systemic reform in both the broader economy and specifically in reference to financial sector institutions (Hartwell 2013). Bank reform itself was part of the institutional transition, and a significant factor in driving individual bank profitability in the years following macroeconomic stabilization (Brissimis et al. 2008). But beyond bank-specific reforms, did the broader institutional environment in transition have a larger impact than in the OECD countries on bank profitability? How did progress in systemic institutional change, the core of transition, translate into bank performance?

This question is particularly salient given the recent global financial crisis, which was mostly grown in developed countries and then imported into emerging markets (including transition economies) via trade and financial sector channels. It is possible that institutional development was even more crucial to the performance of bank profitability in transition economies during the crisis, explaining the differential effects of the crisis on bank profitability across the transition space (Figs. 1, 2, 3, and 4). Indeed, there was considerable variation across banks in transition, with Polish banks showing higher levels of profitability than their Czech counterparts even in the crisis years. In the Balkans, Bulgaria's banks never recovered from the crisis, as evidenced by their latest banking crisis in September 2014, while further east, Ukrainian banks, never very profitable in the aggregate, were also badly hit by the financial crisis. Given these different trajectories, the hypothesis that transition economies that had moved much further in broader institutional reforms would have more profitable banks, even during the crisis, seems eminently plausible.

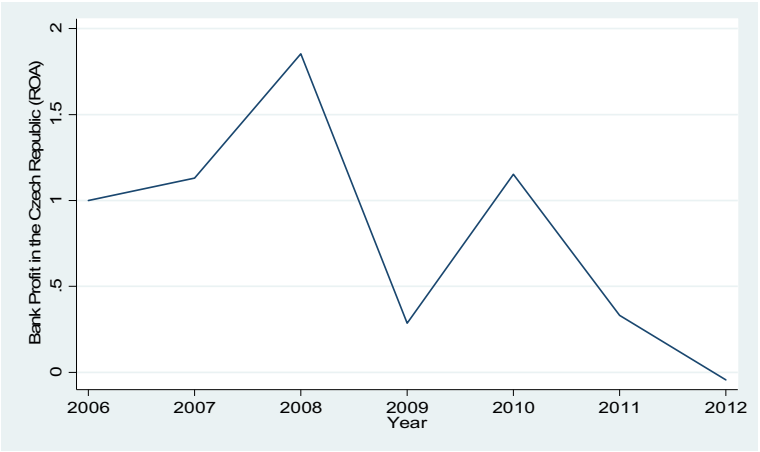

Fig. 1 Average bank profitability in the Czech Republic, 2006–2012

The purpose of this paper is to test this hypothesis and to examine the performance of banks in transition during the global financial crisis and immediately thereafter. I argue that bank performance can be understood as a function of a country's underlying institutional structure, which may have been crucial in helping banks in transition weather the deluge; in particular, I examine whether and how contracting institutions (property rights) and political representation (democratic accountability) impacted bank profitability in transition during this time. The results presented below find, in contrast to Beltratti and Stulz's (2012) findings, that investor-specific property rights were important for all countries, but were most significant for bank profitability during the crisis. Additionally, greater levels of democracy appear to be correlated with lower bank profitability, an effect that is related to the ability of interest groups to influence the pace of reform.

This paper makes a novel contribution to the literature in three ways: first, this paper applies proven methodologies specifically to the transition countries of Central and Eastern Europe (CEE) and the former Soviet Union (FSU). This is therefore the first

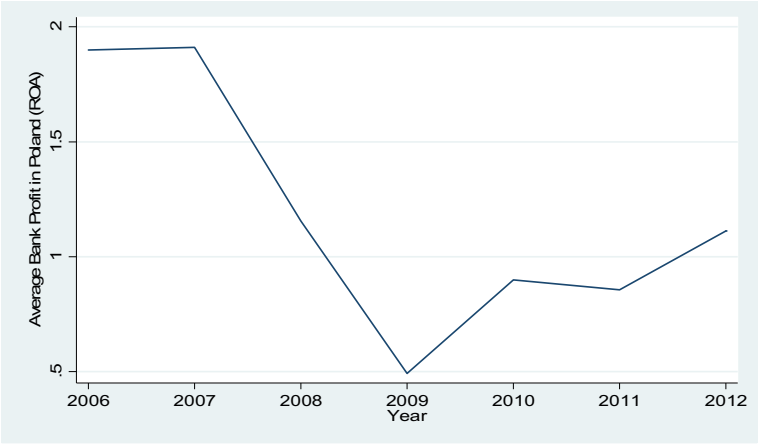

Fig. 2 Average bank profitability in Poland, 2006–2012

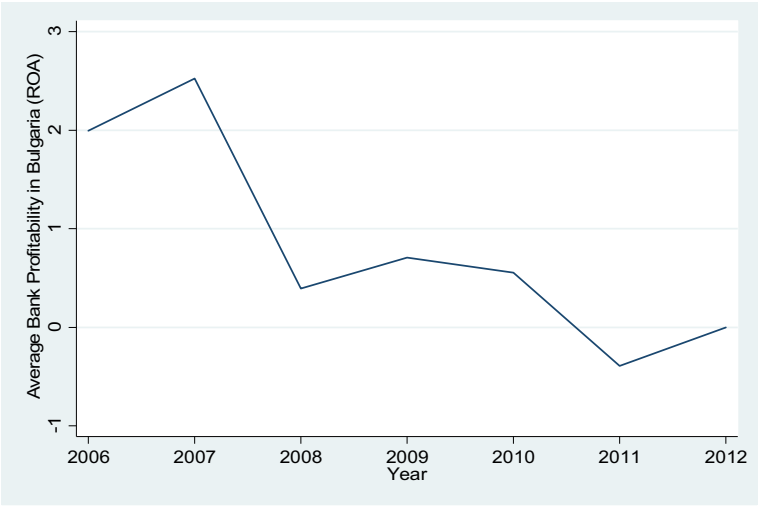

Fig. 3 Average bank profitability in Bulgaria, 2006–2012

study examining bank profitability in transition after a major crisis, a fact that helps differentiate it from such papers as Fang et al. (2014), which focuses on bank risk up to the crisis (1997–2008).[1] Secondly, the frontier of knowledge on institutions, and in particular in quantitative institutional economics, has been pushed outward in recent years (see Hartwell 2013), meaning that we have much more accurate (or at least complete) ways to quantify institutional development. This paper makes use of these innovative indicators in a manner heretofore unexplored in the literature. Finally, earlier studies on bank profitability have failed to incorporate model uncertainty into their analysis, an issue given the possibly large set of variables that can influence banking performance. This paper is the first to my knowledge to utilize Bayesian methods to discern a "correct" model of bank profitability in transition during a crisis.

The paper is organized as follows: the next section provides an overview of the theoretical basis for institution affecting bank profitability in transition, as well as an overview of some of the previous literature in this area. Section III outlines the data and empirical strategy for testing these relationships, while Section IV examines the results and performs a large number of robustness tests to check the validity of these outcomes. Section V concludes with some policy implications for banks and policymakers.

2 Bank Profitability in Transition: The Role of Institutions

There are many reasons, especially in a transition economy, why bank profitability may be influenced in a crisis by the broader institutional environment. In the first instance, there is of course the large background literature relating good institutions positively to financial sector development (Demirgüç-Kunt and Levine 1996; Claessens and Laeven 2003), in that good institutions help support the growth of the financial sector more broadly. There also already exists a wealth of research on institutional development in

[1] Moreover, Fang *et al.* (2014) do not include CIS countries in their dataset, which I do here.

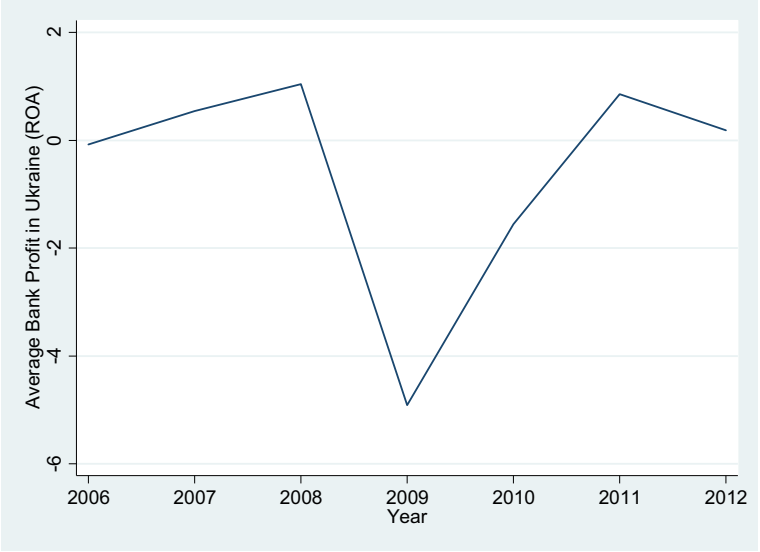

Fig. 4 Average bank profitability in Ukraine, 2006–2012

transition, with work such as Brunetti et al. (1997), Havrylyshyn and van Rooden (2003), and Hartwell (2013) taking a methodical look at the various institutions needed for a market economy and how they impacted different parts of the real economy in transition. Linking these two strands of research together is the diverse body of work on how institutions would influence financial outcomes: in addition to Demirgüç-Kunt et al. (2004) and Athanasoglou et al. (2008), very recent work from Fang et al. (2014) has already found some evidence of the impact of institutions on bank stability in transition. Given this empirical backing, it is plausible to expect that these same institutional changes may have benefitted the banking sector writ large and individual banks in particular.

On a theoretical level in relation to bank profitability, one could expect property rights to make contracting more secure and provide at least a legal basis for trust; thus, even in the midst of a financial crisis, security of property rights should help banks to weather the storm better than if there were worries about expropriation or nationalization. This fact would be especially true in a transition economy, where the experience of dealing with capitalist financial intermediation is far lower than in established Western countries. Moreover, secure property rights tend to correlate with less governmental interference, meaning that banks can minimize costs (and, by extension, raise profitability) associated with policy uncertainty. There is some empirical support for this theory, as Demirgüç-Kunt et al. (2004) found that positive institutional indicators are associated with lower cost of financial intermediation for each particular bank.

On the other hand, a theory advanced by Diamond and Rajan (2001) posits that bank deposits are an attractive alternative to formal property rights, especially in an environment where investors are not well-protected. Under this formulation, banks act as an ersatz contracting institution when broader legal and/or personal protections are weak. However, this implies that private banks could actually do better in a weak-contracting environment, as substitutes will be less available, allowing for banks to capture a much

larger share of the financial intermediation market (there is also empirical evidence that banks perform better in such an environment due to opportunities revealed via corruption, see Aburime 2009). If we accept this argument, it is plausible that broader property rights may actually harm bank profitability, by allowing alternatives to bank-based financial intermediation, and making margins smaller. In a crisis situation, especially one where banks were the epicenter for the crisis, better property rights may allow a flight away from banks and a concomitant drop in bank profitability.

Similarly, political institutions may also affect bank profitability in uncertain ways. In theory, a more democratic polity may make better economic choices than a dictator acting alone (Rodrik and Warcziag 2005), thus positively influencing the broader environment that a bank operates in. Based on an analysis of emerging economies, Rodríguez and Santiso (2008) find that banks do indeed prefer, based on their lending patterns, stable emergent democracies (although their analysis neglects the issue of bank profitability). On the other hand, democracies, especially in the throes of a crisis, are prone to fits of populism and bad economics (Przeworski and Limongi 1993), perhaps creating a popular desire for bailouts to save banks in particular (although Rosas (2006) found the opposite, in that democratic regimes tend to rely on bank closures more on average than bank bailouts). In direct relation to bank profitability, populism could also go the other way, as public clamors for additional regulation and policies could directly strike at the bottom line for any one particular bank. In a related vein, the public could not necessarily advocate directly for harsher bank regulations, but instead elect leaders of a certain political stripe (i.e. left-wing) that are more likely to be less friendly to banks.

3 Empirical Strategy

3.1 The Data and Empirical Model

The data for this exercise comes from a newly assembled database of banks in transition economies from 2006–2012 derived from various sources. Bank-level data for the most part were derived from the BankScope database, but the most labor-intensive portion of the database, the coding on foreign or domestic ownership, came from scrupulous examination of publicly available sources, bank websites, and bank regulatory filings. In total, 1963 banks from 30 transition countries over the timespan 2006–2012 are included in this dataset, although not every bank has a complete 5-year series (Table 1 shows the countries included and the number of banks from each country). Moreover, not every variable is available for each country in each year, meaning a shifting window that translates in practice to approximately 7000 to 9000 observations (see Table 2 for descriptive statistics of the complete database).

The baseline empirical model, as is common in the literature (and similar to Dietrich and Wanzenried 2011), will express bank profitability as a function of bank-specific, industry-specific, and country-specific macroeconomic factors. Additionally, coming to the crux of the research question of this paper, institutional factors are added as additional country-specific explanators. The model is thus an examination to determine which factors were more salient in the profitability of banks during and after the global financial crisis. Was it the macroeconomic policies of the governments in the transition

Table 1 Banks by country in the dataset

Country	Number of banks	Percent of total	Cumulative
Albania	112	0.86	0.86
Armenia	154	1.18	2.04
Azerbaijan	217	1.67	3.71
Belarus	182	1.4	5.1
Bosnia and Herzegovina	210	1.61	6.72
Bulgaria	224	1.72	8.44
Croatia	259	1.99	10.42
Czech Republic	301	2.31	12.74
Estonia	77	0.59	13.33
Georgia	105	0.81	14.13
Hungary	308	2.36	16.5
Kazakhstan	294	2.26	18.75
Kosovo	49	0.38	19.13
Kyrgyzstan	98	0.75	19.88
Latvia	154	1.18	21.06
Lithuania	77	0.59	21.66
Macedonia (FYROM)	126	0.97	22.62
Mongolia	84	0.64	23.27
Montenegro	70	0.54	23.8
Poland	434	3.33	27.14
Republic of Moldova	112	0.86	28
Romania	259	1.99	29.98
Russian Federation	7077	54.33	84.31
Serbia	224	1.72	86.03
Slovakia	161	1.24	87.26
Slovenia	182	1.4	88.66
Tajikistan	56	0.43	89.09
Turkmenistan	7	0.05	89.15
Ukraine	1281	9.83	98.98
Uzbekistan	133	1.02	100
Total	13,027		

economies, or was it the institutional make-up of the country? Expressed as an equation, the model is:

$$ROA_{it} = \alpha Bank_{it} + \beta Industry_{it} + \gamma Policy_{it} + \delta Institutions_{it} + \varepsilon_{it} \quad (1)$$

Where ROA is average return on assets, the preferred (as in, *inter alia*, Athanasoglou et al. 2008 and Dietrich and Wanzenried 2011) bank profitability indicator. The positive attributes of ROA as an indicator of profitability have been amply discussed elsewhere (see Golin 2001), but suffice it to say here that ROA is preferred to ROE as ROE disregards risks associated with high leverage (financial

Table 2 Descriptive statistics

Variable	n	Mean	Std. Dev.	Min	Max
Bank specific					
ROA	9901	1.25	5.16	−241.48	98.21
ROE	9892	7.73	29.89	−663.78	900.00
Size	9895	10.64	2.03	−3.22	17.89
Operating costs	9849	77.88	35.14	0.31	921.21
Foreign ownership	13,027	0.28	0.45	0.00	1.00
Credit risk	9817	54.27	20.58	−1.03	99.80
Capital adequacy	9907	20.40	17.77	−446.21	100.00
Industry-specific					
Domestic credit	12,766	46.12	13.98	7.23	106.35
Bank concentration	11,118	45.08	22.70	22.17	100.00
Bank reform	12,958	2.85	0.45	1.00	4.00
Vienna initiative dummy	13,027	0.06	0.24	0.00	1.00
Macro/country-specific indicators					
Inflation	12,877	8.39	5.35	−2.41	59.22
M2 growth	13,020	0.22	0.17	−0.18	1.21
GDP growth	13,027	3.55	5.61	−17.95	34.50
Output gap	13,027	0.00	2.22E+10	−4.07E+10	5.21E+10
Trade to GDP	12,869	76.10	32.66	48.44	180.90
Total tax rate	12,999	47.80	12.45	8.20	137.30
General government final consumption expenditure	12,869	17.89	2.99	6.31	26.99
Population Density	13,027	42.63	43.36	1.65	165.99
US monetary policy	13,027	0.06	0.04	−0.03	0.12
Institutional indicators					
Democratic accountability	12,089	3.49	1.51	1.00	6.00
Investor protection	12,173	8.99	1.24	5.50	11.50
Contract-intensive money	12,849	0.74	0.08	0.28	0.94
Government partisanship (left-wing)	13,027	0.15	0.36	0.00	1.00

leverage ratios can also be endogenously determined by regulation). As a robustness check, however, ROE will also be included as a possible indicator of bank profitability, keeping in mind the caveat associated with bank debt.

In relation to the bank-, industry-, and country-specific indicators, a large number of possible determinants of profitability have been identified in the literature; given this embarrassment of riches, a rigorous econometric method (detailed below) will be utilized in order to pare down variables and obtain the "correct" model. Bank-specific attributes are not chosen randomly for, as noted above, there is a large literature on the bank-specific drivers of bank profitability. For example, Molyneux and Thornton (1992) find that bank concentration is a positive explanator of bank profitability, while Goddard et al. (2004) find that bank size is negatively correlated with profitability in European banks. Dietrich and Wanzenried (2011) extend this analysis to

find that bank profitability in Switzerland is mainly explained by bank-specific factors such as operational efficiency (positively) and the growth of total loans and funding costs (negatively). Beltratti and Stulz (2012), incorporating measures of both bank-specific and country-specific institutional and governance factors, also show that the largest factors of profitability remained bank-specific, including total assets. In addition, Athanasoglou et al. (2008) find that capital adequacy and credit risk are also important determinants of bank profitability (adequacy positively and credit risk negatively), and these are also included as explanatory variables. Finally, given the importance of foreign banks for developing the financial sector in transition, I include a dummy for foreign ownership, justified by the empirical results from Claessens et al. (2001). Table 3 shows a complete list of the various indicators utilized in the econometric estimation and the provenance of the data.

Similarly, industry-specific, policy, and macroeconomic variables are taken from the literature. In particular, prudent macroeconomic policies before the onset of the crisis may have made the entire economy of a country more resilient to the exogenous financial shock; as Flamini et al. (2009) show for banks in 41 countries in sub-Saharan Africa, macroeconomic policies that promote low inflation and stable output growth are good for the performance of banks in those countries. Thus, a country that was well-prepared macroeconomically before the crisis may have been better-equipped to deal with the crisis. To account for these macroeconomic policies that would influence bank profitability, I include inflation, M2 growth, GDP growth, output gap, taxation, government size, and trade ratio to GDP as part of the baseline specification. In particular, inflation, M2 growth, taxation, the output gap, and government size would signal macroeconomic distortions in an economy, proxying for policies that promote instability and would be expected to have a negative effect on a bank's balance sheet. Similarly, GDP growth and trade ratios should be a signal of prudent macroeconomic policies, including liberalization of the enterprise and trade sector, and should positively impact bank profitability.

Additionally, some country-specific traits not included in any of these papers, but that will be utilized in this model, are also included in this paper. For example, population density is included as a determinant of profitability, the theory being that a more dense population will have more need for financial intermediation than one that is widely dispersed, thus increasing bank profitability. A case can also be made that institutional attributes, being slow-formed and possibly slower-acting, would be less consequential for the short-term balance sheets of banks in the region than swifter macroeconomic adjustments taken globally. Indeed, while the crisis may have harmed profitability in the short-run, the global response to the crisis may have provided quick relief in the form of lower interest rates, ample liquidity, and sovereign and quasi-sovereign guarantees ("too big to fail") that would have bolstered bank profitability. To capture this policy effect, a metric of the growth of M2 in the United States is included; we should anticipate the quantitative easing of the US Federal Reserve to have large positive effects on bank profitability in transition through a domino effect of increased global liquidity.

The true innovation in this paper is not population density or the growth of M2 in the US, however, but, as noted above, the inclusion of specific institutional variables to capture institutional influence on profitability before and after the crisis. The two key institutional variables utilized in the model are the International Country Risk Guide's

Table 3 Data description and sources

Indicator	Description	Source
Bank specific		
ROA	Average Return on Assets (Net Income/Total Assets)	BankScope
ROE	Average Return on Assets (Net Income/Total Equity)	BankScope
Size	Log of liquid assets (expressed in thousands of US dollars)	BankScope, author's calculations
Operating costs	Total costs as a share of total income	BankScope
Foreign ownership	Dummy variable taking the value of 1 if a bank is more than 50 % foreign-owned, 0 otherwise	Bank websites, filings, regulatory sources
Credit risk	Net loans as a percentage of a bank's total assets	BankScope
Capital adequacy	Equity as a percentage of a bank's total assets	BankScope
Industry-specific		
Domestic credit	All credit to the private sector provided by monetary authorities and deposit money banks, as a % of GDP	WDI
Bank concentration	Assets of three largest banks as a share of assets of all commercial banks	Čihák et al. (2012)
Bank reform	Measure of bank reform and liberalization, with a value of 1 for no liberalization and 4.33 for Western European banking standards.	EBRD
Vienna initiative dummy	A Dummy that takes the value of 1 for banks from the countries of Bosnia, Hungary, Latvia, Romania, and Serbia, from 2008 to 2012 and 0 otherwise	Author's calculations
Macro/country-specific indicators		
Inflation	Annual % change in consumer prices as measured by CPI	WDI
M2 growth	Year on year percentage change in absolute M2 levels	WDI, central bank websites, author's calculations
GDP growth	Annual percentage growth rate of GDP at market prices based on constant local currency.	WDI
Output gap		Author's calculations from WDI data

Table 3 (continued)

Indicator	Description	Source
	GDP, in constant 2005 US$, run through a Hodrick-Prescott filter to separate trend and cyclical components.	
Trade to GDP	Sum of exports and imports of goods and services measured as a share of gross domestic product.	WDI
Total tax rate	Amount of taxes and mandatory contributions payable by businesses after accounting for allowable deductions and exemptions, as a share of commercial profits.	WDI
General government final consumption expenditure	All government current expenditures for purchases of goods and services (including compensation of employees), as % of GDP.	WDI
Population density	People per sq. km of land area	WDI
US monetary policy	Year on year percentage change in absolute M2 levels of the United States	WDI
Institutional indicators		
Democratic accountability	A measure of how responsive government is to its people, with a score of 0 signifying autarky and a score of 6 a fully-functioning alternating democracy.	ICRG
Investor protection	Proxy for property rights that covers three sub-indexes: Contract Viability/Expropriation, Profits Repatriation, and Payment Delays. Scored from 0 to 12, with higher numbers representing more property rights.	ICRG
Contract-intensive money	Ratio of M2 less money outside depository corporations to total M2	IMF IFS, central bank websites, author's calculations
Government partisanship (left-wing)	Dummy variable taking 1 if the party/leader in power is left-wing, 0 otherwise	Author's calculations based on party websites

(ICRG) indicators for investor protection and democratic accountability, where investor protection represents the legal framework for property rights (or, if you will, *potential* property rights) and democratic accountability represents the ability of the individual voter to influence the political system. The ICRG indicators are standard in the literature for measuring institutional progress (see Djankov et al. 2006 or Akitoby and Stratmann 2010), as they capture the legal and political environment governing both property rights and the political system.

As a check on the subject investor protection ranking, I also utilize an objective indicator for property rights, contract-intensive money, which represents the proportion of money held inside the formal banking sector (see Clague et al. 1996 and Hartwell 2013). In contrast to the investor protection indicator, contract-intensive money is more accurately described as *realized* property rights, as it measures the behavior of individuals in reaction to perceived changes in property rights. Of course, as with all objective indicators, its drawback is that it may capture more than just property rights (see Williams and Siddique 2008 for a critique of its use); however, when paired with the ICRG indicator of investor protection, I believe it will deliver a full picture of both ex ante and ex post property rights.

A further critique on the use of contract-intensive money is that it may appear odd to use a banking indicator also an institutional indicator, but it can be justified due to its particular attributes. In the first instance, as we are attempting to ascertain the profitability of particular banks, as influenced by institutions, contract-intensive money is a suitable proxy as no one bank influences the indicator; that is, while it functions as a vote of confidence in the entire banking sector and property rights in general, unless you are a country like Turkmenistan with a monobank structure, no single bank can dominate the outcome of the indicator. Moreover, while contract-intensive money may sometimes be thought of as a proxy for financial depth (Williams and Siddique 2008), previous empirical tests by Clague et al. (1996) have shown that contract-intensive money does indeed capture different effects than broader financial sector development. This is indeed the case here for, as Table 4 shows, while there is some moderate correlation between CIM and other financial depth variables (with the strongest being with country-wide bank capital to assets ratio at 0.5094), the extent of the correlations do not suggest that contract-intensive money cannot be used. Finally, and similarly, econometrically, contract-intensive money shows almost zero collinearity with the bank profitability variables or even the investor protection indicator (see Table 4), also signaling its suitability in capturing property rights, rather than financial aspects.

3.2 Econometric Methodology

As our database is a classic short panel (small t, incredibly large n), the model utilized is a (within group) fixed-effects estimator. The choice of a static fixed-effects approach is conditioned on the dataset, as results of a Hausman test on the full model yielded results that conclusively rejected a random-effects estimator. Moreover, given the importance of each individual year in this sample, and given that this examination covers pre-crisis, crisis, and post-crisis years, I have included period-specific fixed effects as well, a technique confirmed via a Wald test. A modified Wald test for groupwise heteroskedasticity likewise confirmed that our data is indeed heteroskedastic, and thus robust standard errors, allowing for country and bank clustering, are also utilized.

Table 4 Variable correlations

	ROA	ROE	Contract-intensive money	Investor Protection	Democratic Accountability	Size	Costs	Foreign Ownership	Credit risk	Capital Adequacy	Domestic Credit	Bank Concentration
ROA	1.00											
ROE	0.26	1.00										
Contract-intensive money	−0.09	−0.05	1.00									
Investor protection	0.02	0.06	0.35	1.00								
Democratic accountability	−0.11	−0.05	0.52	−0.03	1.00							
Size	−0.02	0.01	0.23	0.05	0.29	1.00						
Costs	−0.32	−0.27	−0.01	0.00	−0.09	−0.23	1.00					
Foreign ownership	−0.06	−0.02	0.29	0.06	0.43	0.24	−0.06	1.00				
Credit risk	−0.03	0.01	0.06	0.02	0.17	0.00	−0.11	0.16	1.00			
Capital adequacy	0.31	−0.07	−0.13	−0.08	−0.22	−0.38	0.04	−0.12	−0.19	1.00		
Domestic credit	−0.10	−0.10	0.44	0.02	0.52	0.22	0.05	0.20	0.09	−0.13	1.00	
Bank concentration	−0.08	−0.04	0.14	−0.31	0.67	0.29	−0.10	0.37	0.16	−0.15	0.44	1.00
Bank reform	−0.08	−0.03	0.58	0.41	0.78	0.26	−0.05	0.35	0.14	−0.18	0.57	0.33
Inflation	0.03	0.02	−0.20	−0.24	−0.24	−0.15	0.02	−0.16	−0.05	0.09	−0.11	−0.06
Growth of M2	0.10	0.10	−0.21	−0.06	−0.16	−0.13	−0.12	−0.11	−0.05	0.06	−0.42	−0.17
GDP growth	0.11	0.12	−0.14	0.01	−0.14	−0.05	−0.14	−0.05	0.03	−0.01	−0.43	−0.10
Output gap	0.01	0.03	−0.01	−0.02	−0.04	0.01	−0.01	0.00	0.08	−0.05	0.03	0.03
Trade to GDP	−0.07	−0.02	0.36	−0.05	0.70	0.27	−0.13	0.43	0.17	−0.16	0.45	0.78
Total tax rate	0.07	0.07	−0.22	−0.25	−0.20	−0.10	−0.01	−0.14	−0.08	0.05	−0.17	0.13
Size of government	0.00	−0.03	0.10	0.12	0.06	−0.07	0.13	−0.06	−0.03	0.04	0.36	−0.07
Population density	−0.08	−0.04	0.28	−0.01	0.79	0.28	−0.11	0.44	0.19	−0.18	0.23	0.67
US monetary policy	0.06	0.08	−0.07	0.01	0.07	−0.03	−0.13	0.00	0.06	−0.02	−0.18	−0.04

Table 4 (continued)

	Bank Reform	Inflation	Growth of M2	GDP Growth	Output Gap	Trade to GDP	Total Tax Rate	Size of Government	Population Density	US Monetary Policy
Bank reform	1.00									
Inflation	−0.35	1.00								
Growth of M2	−0.27	0.26	1.00							
GDP growth	−0.20	−0.01	0.52	1.00						
Output gap	0.00	0.10	−0.09	0.35	1.00					
Trade to GDP	0.51	−0.11	−0.15	0.00	0.02	1.00				
Total tax rate	−0.38	0.29	0.22	0.12	0.03	−0.06	1.00			
Size of government	0.14	−0.07	−0.17	−0.38	−0.16	0.01	0.09	1.00		
Population density	0.55	−0.28	−0.17	−0.06	0.00	0.72	−0.16	−0.06	1.00	
US monetary policy	0.01	0.21	0.34	0.31	0.32	0.04	0.13	−0.16	0.00	1.00

Although these standard errors are robust to serial correlation, tests on the full model yielded little evidence of serial correlation over this short time span (with a Wooldridge test for autocorrelation yielding an F-stat of 0.238 with a probability of 0.6255 for ROA and 0.426 for ROE, failing to reject the null of no first-order autocorrelation).[2]

Moreover, as noted above, given the large number of possible variables and the reality of model uncertainty, Bayesian model averaging (BMA) in line with Hoeting et al. (1999) and O'Hara and Sillanpää (2009) will be utilized to narrow down the thousands of possible model combinations into more "correct" specifications for examining bank profitability. As Fernandez et al. (2001:566) noted, BMA provides a "practical and theoretically sound method for inference," while Hoeting et al. (1999:398) correctly note that "In theory, BMA provides better average predictive performance than any single model that could be selected, and this theoretical result has now been supported in practice in a range of applications involving different model classes and types of data." The BMA model utilized in this paper is based upon the priors and sampling mechanism of Magnus et al. (2010); such an approach assumes a base model of:

$$y = W\beta + Z\delta + v \tag{2}$$

Which incorporates a classical Gaussian linear model, non-informative priors for the β coefficient (as well as the error variance *v)*, and a multivariate Gaussian prior for δ (Dardanoni et al. 2012). The use of BMA will thus help to consolidate our broad range of explanatory variables to a more parsimonious set.

While this approach covers conditional heteroskedasticity of unknown form and possible serial correlation, the fixed-effects approach does not eliminate the possibility of endogeneity, an issue that is omnipresent in the consideration of institutions (Przeworski 2004; Eicher and Leukert 2009; Hartwell 2013) as well as in bank decisions regarding capital adequacy (Athanasoglou et al. 2008). Given this possible endogeneity of some of our variables, an IV-GMM regression will be utilized for robustness, with the institutional indicators instrumented by appropriate macro-economic and country-specific indicators as derived from the literature and described in more detail below. Standard econometric tests for instrument suitability will be performed, but this IV-GMM approach will allow us to correct for unobserved fixed-effects, heteroskedasticity, serial correlation, and endogeneity.

4 Results and Discussion

4.1 Baseline Specifications

To correct for model uncertainty, a BMA approach is utilized to derive a parsimonious model from the full set of possible variables. Keeping the institutional indicators as the

[2] Although Dietrich and Wanzenried (2011) correctly note the persistence of bank profits (thus arguing for a system-GMM approach in their paper), this persistence, as just noted, is not present in my data. In particular, the relatively short time frame, coupled with the straddling of a major financial crisis, means that the ROA indicator utilized here exhibits little serial correlation, as well as arguing against a dynamic specification such as system-GMM.

focus parameters for the analysis, Bayesian averaging was conducted first on all regressors (focus and auxiliary) over a space of 2,097,152 possible models (1,048,576 possible models for each of the ROA and ROE specifications). The criterion for determining robust correlation with the outcome variable for the auxiliary regressors was suggested by De Luca and Magnus (2011), and involves retaining auxiliary variables which have an absolute value of *t*-ratios over 1 (which also satisfies the criteria that their two standard error confidence intervals do not include zero). This approach avoids the ad hoc rule of thumb of Kass and Wasserman (1995), which removes "weak" variables (i.e. those with a posterior inclusion probability of 0.5–0.75, see Eicher et al. 2011), but has less predictive power than the "median" model used by De Luca and Magnus (2011).

The results for the Bayesian averaging exercise are shown in Table 5 for both ROA and ROE as a dependent variable. Using this guideline, we turn to the baseline fixed-effects model for ROA shown in Table 6, with clustering on the bank and country variables. As with earlier work, bank-specific attributes appear to be important, with operating costs having the largest significance economically and statistically. Institutional variables appear to dominate the regression, however, with every additional point of ICRG's investor protection scale in a country leading to an increase of

Table 5 Bayesian model averaging results, fixed-effects specification

ROA			ROE			
Variable	t	pip	Variable	t	pip	
Constant	8.43	1.00	Constant	−0.83	1.00	Focus variables
Contract-intensive money	−0.59	1.00	Contract-intensive money	−0.22	1.00	
Investor Protection	2.71	1.00	Investor Protection	4.13	1.00	
Democratic Accountability	5.05	1.00	Democratic Accountability	1.28	1.00	
Size	−9.27	0.66	Size	−0.05	0.01	Auxiliary variables
Operating Costs	−31.00	1.00	Operating Costs	−25.17	1.00	
Foreign Ownership	0.29	0.09	Foreign Ownership	0.00	0.01	
Credit Risk	−7.03	1.00	Credit Risk	0.14	0.03	
Domestic Credit	−0.88	0.49	Domestic Credit	−4.32	1.00	
Bank Concentration	0.11	0.03	Bank Concentration	0.44	0.19	
Bank Reform	0.21	0.06	Bank Reform	1.13	0.62	
Inflation	−1.29	0.71	Inflation	−0.02	0.02	
M2 Growth	−0.09	0.02	M2 Growth	0.03	0.01	
GDP Growth	2.81	0.94	GDP Growth	2.05	0.84	
Output Gap	0.05	0.02	Output Gap	−0.07	0.02	
Trade to GDP	−0.27	0.09	Trade to GDP	−0.16	0.04	
Total Tax Rate	0.04	0.02	Total Tax Rate	−0.18	0.05	
Government Size	0.70	0.38	Government Size	4.14	1.00	
Population Density	0.04	0.02	Population Density	−0.77	0.45	
US Monetary Policy	0.32	0.12	US Monetary Policy	1.76	0.82	

nearly a third of a percentage point of a bank's return on assets. A perhaps more puzzling result is that democratic accountability appears to be a negative (albeit less significant) influence on bank profitability, one that almost perfectly counterbalances the positive effects of investor protection. Indeed, this result holds even though the country-specific attributes of Russia (whose banks are disproportionately represented in the dataset) are controlled for by the fixed-effects specification. In regards to return on assets, it appears that having a more engaged polity in the midst of a crisis is a bad situation for a bank, even if the economy itself is growing, but property rights are crucial for bringing banks back to profitability.

As noted earlier, an alternate proxy for bank profitability could be ROE, which has been utilized in papers such as Guru et al. (2002) and Athanasoglou et al. (2008). While perhaps imperfect when compared to ROA, due to the bias in ROE understating the dangers of leverage, it provides a different measure of bank profitability for robustness. The BMA analysis for ROE, already shown in Table 5, holds some interesting results. There are important differences from the ROA model, with policy variables holding much more of an importance in the ROE analysis and bank-specific attributes are almost entirely insignificant. Finally, one similarity between the two metrics, however (not shown here), was an almost perfect insignificance of the year dummies across the entire model space, with no one year scoring a PIP above 10 %.

The BMA fixed-effects regression for the ROE model is shown in Column 2 of Table 6, where US monetary policy and GDP growth in particular seem to dominate, with only operating costs remain as a significant bank-specific trait. More importantly, for our variables of interest, investor protection remains a significant and positive explanator of bank profitability, with every step up ICRG's ladder leading to an additional 4 % of return for a particular bank. Perhaps paradoxically, broader property rights have a surprisingly negative effect on returns on equity, with each additional percentage of money held inside banks leading to an 18 % decline in ROE. Indeed, on the whole, ROE appears to be driven by outcomes external to the specific bank during the crisis period, with US monetary policy increasing the returns and broader property rights dampening the return of any one bank.

These results cover both the crisis and post-crisis periods, but an interesting research question is whether or not institutions had a different effect during the global financial crisis, as opposed to after it. To answer this question, I separate both the ROA and ROE samples in two, one crisis period (2006–2009) and one post-crisis (2010–2012), which results in a fairly even split of the full sample. The effects by period are shown in Columns 3 and 4 for ROA and Columns 5 and 6 for ROE, and there are differences that stand out immediately. In the first instance, investor protection appeared to be most important institution for bank profitability during the crisis, tapering in terms of importance after the crisis. Indeed, for every point of investor protection during the crisis years, banks saw an average of 16.5 % more return on equity, while this effect dropped to a mere (and statistically insignificant) 1.5 % in the post-crisis period. By contrast, democratic accountability was not important in either sub-period, and overall property rights were important only post-crisis (and only then marginally) for return on assets. Of the bank-specific attributes, operating costs weighed heavily on profitability throughout the crisis and beyond. Perhaps

Table 6 Fixed-effects regression results, ROA and ROE as a function of institutions

	Dependent variable					
	ROA	ROE	ROA		ROE	
	Full sample	Full sample	Crisis	Post-crisis	Crisis	Post-crisis
	1	2	3	4	5	6
Institutional indicators						
Democratic Accountability	−0.34	−4.36	−0.66	−0.23	5.09	−16.13
	*1.92**	*3.87***	*1.39*	*0.63*	*1.14*	*1.23*
Investor Protection	0.31	4.04	0.87	0.07	16.23	1.50
	*2.99***	*4.42***	*2.59***	*0.52*	*2.86***	*1.00*
Contract-intensive money	−0.20	−18.24	−4.58	3.13	44.22	6.61
	0.12	*2.01**	*1.09*	*1.64**	*0.91*	*0.18*
Bank specific						
Size	0.07		0.31	0.20		
	0.67		*1.47*	*0.84*		
Operating costs	−0.04	−0.29	−0.04	−0.06	−0.23	−0.40
	*5.61***	*6.11***	*3.50***	*2.73***	*3.33***	*4.52***
Credit risk	0.01		0.03	0.01		
	*1.75**		*1.58*	*0.97*		
Industry-specific						
Domestic credit		−0.13			−0.22	0.01
		1.61			*1.34*	*0.01*
Bank reform		1.13			−4.63	−17.52
		0.22			*0.43*	*0.80*
Macro/country-specific indicators						
Inflation	−0.03		−0.04	−0.05		
	*1.67**		*1.21*	*2.55***		
GDP Growth	0.05	0.63	0.07	−0.01	0.03	−0.61
	*5.80***	*3.75***	*5.49***	*0.10*	*0.07*	*0.53*
Government size		1.42			−0.12	1.95
		*2.47**			*0.09*	*2.39**
US monetary policy		26.30			176.38	−54.51
		*3.13***			*3.57***	*0.66*
C	1.46	−5.04	−2.57	0.95	*−164.11*	86.65
	0.66	*0.35*	*0.39*	*0.20*	*2.31**	*1.17*
n	9097	9065	4882	4215	4930	4135
Adjusted R-squared	0.32	0.26	0.34	0.37	0.18	0.51

Absolute value of t-stats shown underneath coefficients; * denotes significance at the 10 % level and ** at the 1 % level. Fixed effects specification with clustering on country and bank variables

most intriguingly, US monetary policy was a boon to bank return on equity during the crisis period, but a hindrance (albeit insignificant) in the post-crisis era.

4.2 Robustness Tests

Given these sometimes paradoxical results, a series of robustness tests are called for. In particular, the erratic behavior of democratic accountability in the baseline regressions is puzzling: while democracy appears to be a positive influence for ROE during a crisis period (Table 6, Column 5), for every other specification it is negative. It is possible that what matters for the banking environment is not necessarily the ability of the populace to influence the political process, but *how* they do it, that is, what sorts of leaders they elect. Calderon and Schaeck (2013) note that left-wing governments are more likely to intervene (i.e. bailout) banks in order to maintain employment, while right-wing governments should, in theory, be more laissez-faire. However, such a relationship is ambiguous in transition, as the linkages between both sides of the ideological spectrum and the banking sectors in many transition countries (Jackowicz et al. 2013) makes the influence of orientation on profitability more difficult to ascertain.

To control for the partisan effects on bank performance in a democracy, in Table 7 I include a dummy variable if the leader of a country is left-wing (Social Democrat or Communist) or not, taking a value of 1 if the country's leader or his or her party has an explicit left-wing ideology, with a value of 0 if the leader/party is right-wing or centrist.[3] Results of this further robustness test are shown in Columns 1–4 of Table 7. In relation to ROA (Column 1), the presence of a left-wing government per se is insignificant, while the negative of influence of democracy persists. For ROE (Column 3), the left-wing government shows a negative but marginally significant influence, while once again democracy appears to be bad for return on equity. Perhaps this effect is a multiplicative one, however, and so in Columns 2 and 4 I interact the left-wing dummy with the democracy indicator, on the theory that left-wing populists might be more likely to crack-down on bank profitability than leaders who are fairly well-insulated from the political process (even if they are left-wing). This approach also yields interesting results; for ROA, the interaction term just misses significance, while the presence of a left-wing government and democracy are bad for bank profitability in transition. By contrast, left-wing governments and democracy are strongly and unequivocally bad for bank profits as measured by ROE, but the interaction term is positive.

Finally, perhaps it is not the type of leader in a democracy that affects bank profitability, but the lobbying power of a few well-connected banks. Rajan and Zingales (2003) note that democracy enables interest groups to influence the path of financial sector development, creating barriers to entry in order to preserve the monopoly status of already-existing banks. This could lead to lower bank profitability on average, even as it privileges a select few. To test this, I include the measure of bank concentration interacted with democracy in Columns 5 and 6 of Table 7. As predicted, for ROA concentration itself shows a moderate increase in bank profitability, but the congruence of democracy and concentration leads to lower profitability on average. Similarly, for ROE, the same effect is seen but is statistically insignificant. In either

[3] Coding was done manually and based on the explicit party platform or stated affiliation of the country's leader.

case, democratic accountability in and of itself has a mildly positive but insignificant effect on bank profitability.

Beyond the influence of democracy, there may be other peculiarities of the crisis era that may have influenced the performance of banks. One of the largest (and transition-specific) factors possibly omitted from this previously model is the so-called "Vienna Initiative," a grouping of multilateral banks and the largest bank firms active in Central, Eastern, and Southeastern Europe (CESEE) convened in January 2009 to ensure continued cross-border flows to the region. In the first round, dubbed "Vienna 1.0," five countries in particular were targeted for assistance (Bosnia and Herzegovina, Hungary, Latvia, Romania, and Serbia) due to the perception that these countries would be most affected by a general halt in cross-border bank flows. As the key objective of Vienna 1.0 was to keep money flowing to foreign-owned subsidiaries in Central and Eastern Europe, this intervention could have had an effect on the balance sheets of banks that was unrelated to other macroeconomic, institutional, or other country-specific attributes.

To account for this reality, I include a dummy for banks based in these five countries from the period of 2008 onward for both the ROA and the ROE regressions. With the inclusion of a further variable, the BMA analysis is re-run as well, leading to the pared-down specification shown in Columns 7 and 8 of Table 7. For the most part, in regards to ROA, the results are unchanged, with democratic accountability losing a bit of its significance and investor protection gaining more, but the scale is roughly equivalent. On the other hand, the inclusion of the Vienna Initiative dummy creates large changes in the behavior of institutions to ROE; while (as in the ROA analysis) the Vienna dummy itself is insignificant, the sign and magnitude of democratic accountability changes appreciably. Once a mildly positive influence, democracy is now a strongly and significantly negative predictor of bank profitability. Bank-specific traits, absent from the earlier BMA exercise, re-enter the ROE equation, with operating costs negatively influencing profitability, at least on equity.

In a similar vein as the Vienna Initiative, perhaps the type of ownership of a bank (foreign versus domestic) would have differential impacts on a bank's profitability.[4] To test this, in Table 8 I re-run the baseline regressions for ROA and ROE on two separate samples, one of foreign-owned and one of domestically-owned banks, and the results provide an interesting glimpse of the quite divergent influence of various institutions depending upon type of bank ownership. In the ROA regressions (the first two columns), country-level institutions have little impact for foreign bank profitability, but investor protection is critical for domestic banks and democratic accountability has a strong negative effect on profitability. On the other hand, for ROE (the third and fourth columns), democracy and enforced property rights are bad for domestic banks, while they have little impact on foreign-owned banks (the importance of a good legislative framework for investors is consistent across both types of financial institutions).

These results contradict Qian and Strahan's (2007) assertion that foreign banks are more sensitive to the legal and institutional environment, in that domestic banks seem to be more affected by democracy and realized property rights. Indeed, the disparate

[4] Even though the ownership dummy was insignificant in the BMA analysis, splitting the sample can yield evidence of different in-group dynamics. Thanks to an anonymous referee for pointing out this possibility.

Table 7 Robustness tests, fixed-effects specification

	Dependent variable							
	ROA 1	ROA 2	ROE 3	ROE 4	ROA 5	ROE 6	ROA 7	ROE 8
Institutional indicators								
Democratic accountability	−0.33	−0.38	−4.24	−5.74	0.48	4.33	−0.33	−4.33
	*1.90**	*2.13**	*3.79***	*5.00***	*1.03*	*1.09*	*1.88**	*3.57***
Investor protection	0.34	0.32	4.57	4.39	0.49	8.71	0.29	4.02
	*2.93***	*2.72***	*4.56***	*4.40***	*2.38**	*4.37***	*2.62***	*4.17***
Contract-intensive money	−0.37	−0.53	−21.32	−25.16	−1.14	26.26	−0.02	−18.10
	0.22	*0.33*	*2.31**	*2.81***	*0.40*	*1.28*	*0.01*	*2.02**
Left-wing government	−0.25	−2.99	−4.91	−76.25				
	0.86	*0.89*	*2.24**	*4.07***				
Left-wing*democracy		0.50		12.84				
		0.83		*3.84***				
Democracy*bank concentration					−0.02	−0.10		
					*1.99**	*1.13*		
Bank specific								
Size	0.07	0.07			0.08		0.07	
	0.67	*0.59*			*0.62*		*0.66*	
Operating Costs	−0.04	−0.04	−0.29	−0.30	−0.04	−0.29	−0.04	−0.29
	*5.63***	*5.64***	*6.09***	*6.21***	*5.65***	*5.08***	*5.58***	*6.05***
Credit risk	−0.01	−0.01			0.01		0.01	
	*1.75**	*1.68**			*1.92**		*1.78**	
Industry-specific								
Domestic credit			−0.12	−0.21		−0.15		−0.13
			1.56	*2.59***		*1.46*		*1.52*
Bank Concentration					0.10	0.44		
					*2.32**	*1.02*		
Bank Reform			0.75	−0.75		−6.65		1.17
			0.14	*0.14*		*0.98*		*0.22*
Macro/country-specific indicators								
Inflation	−0.02	−0.02			−0.05		−0.03	
	*1.66**	*1.54*			*2.25**		*1.69**	
M2 growth								
GDP growth	0.05	0.05	0.66	0.63	0.06	0.66	0.05	0.63
	*5.87***	*5.90***	*3.89***	*3.75***	*6.22***	*3.24***	*5.53***	*3.57***
Government size			1.54	1.52		1.45		1.41
			*2.67***	*2.64***		*2.10**		*2.32**
US Monetary Policy			28.26	25.95		35.34		26.14
			*3.37***	*3.03***		*3.97***		*3.27***
Vienna initiative dummy							−0.32	−0.34
							0.83	*0.10*

Table 7 (continued)

	Dependent variable							
	ROA 1	ROA 2	ROE 3	ROE 4	ROA 5	ROE 6	ROA 7	ROE 8
C	1.37	1.97	−9.02	11.38	−3.50	−91.23	1.49	−5.02
	0.62	*0.85*	*0.62*	*0.78*	*0.83*	*2.70***	*0.67*	*0.35*
n	9097	9097	9065	9065	7653	7723	9097	9065
Adjusted R-squared	0.32	0.32	0.26	0.26	0.34	0.26	0.32	0.26

Absolute value of t-stats shown underneath coefficients; * denotes significance at the 10 % level and ** at the 1 % level. Fixed effects specification with clustering on country and bank variables

impact of democracy by ownership type shown in these regressions could be what is driving the negative correlation between democracy and profitability in the larger sample. These results may also suggest a plausible theoretical explanation for the negative relationship seen to this point: simply put, foreign-owned banks may be less subject to populist legislation than domestic banks, being able to leave a certain market if things become too difficult. Domestic banks do not have this luxury, and thus a more democratic polity inclined towards policies deleterious to banks would logically harm them disproportionately.

Lastly, as noted above, endogeneity is a common problem in institutional regressions (Eicher and Leukert 2009) and especially in a transition context (Hartwell 2013); moreover, it is possible that various facets of bank performance themselves are endogenous based on the broader institutional environment (Athanasoglou et al. 2008). To cope with this issue, an IV-GMM specification was utilized that instrumented one bank-specific attribute (capital adequacy) and the three institutional variables (investor protection, democratic accountability, and contract-intensive money). Capital adequacy was omitted from earlier regressions due to worries about its endogeneity (Athanasoglou et al. 2008), but a new BMA analysis yields evidence of its importance: Table 9 reports the results of the BMA testing of 4,194,304 models (2,097,152 models a piece for ROA and ROE), with equity to total assets showing a robust correlation with ROA and ROE.

More importantly for our purposes is the possible endogeneity of institutions over this shorter time period. The fact that institutional change did in fact occur during the global financial crisis could be attributed to exogenous factors, in that institutional change was merely continuing the process of transition begun up to 25 years earlier. However, it is also plausible that the prevailing macroeconomic and financial conditions during this period could have effected institutional change, as well as the previous path that a country's institutional system was on. To correct for this possible endogeneity, in both the ROA and ROE regressions I utilize the one-year lag of the institutional variable as an instrument for that specific institution.

As this instrumentation strategy would result in an exactly specified equation, as well as likely miss the other variables influencing institutional change, I also bring in two additional instruments in the ROA regression: bank liberalization, on the assumption that a country's level of financial reform could influence both the development of

Table 8 Fixed-effects regressions by type of ownership

	ROA		ROE	
	Foreign	Domestic	Foreign	Domestic
Institutional indicators				
Democratic accountability	−0.08	−0.61	−2.86	−3.51
	0.19	*2.91***	*1.10*	*3.13***
Investor protection	0.15	0.44	4.27	3.09
	0.89	*3.37***	*3.22***	*3.00***
Contract-intensive money	3.90	−1.55	21.64	−26.39
	0.86	*1.05*	*0.77*	*2.79***
Bank specific				
Size	0.19	−0.02		
	0.79	*0.13*		
Operating costs	−0.03	−0.06	−0.35	−0.25
	*3.57***	*5.56***	*4.82***	*4.80***
Credit risk	0.03	0.01		
	*2.76***	*1.04*		
Industry-specific				
Domestic credit			−0.17	−0.09
			1.31	*0.89*
Bank reform			−0.84	6.72
			0.09	*2.27**
Macro/country-specific indicators				
Inflation	−0.04	−0.02		
	*1.91**	*0.87*		
GDP Growth	0.12	0.03	1.17	0.41
	*5.60***	*2.86***	*2.25**	*3.32***
Government Size			1.64	0.80
			*1.65**	*1.53*
US monetary policy			13.03	27.31
			0.44	*3.49***
C	−5.34	4.60	−32.06	−3.24
	1.28	*1.93**	*0.96*	*0.22*
n	2084	7013	2066	6999
Adjusted R-squared	0.36	0.32	0.29	0.21

Absolute value of t-stats shown underneath coefficients; * denotes significance at the 10 % level and ** at the 1 % level. Fixed effects specification with clustering on country and bank variables

property rights and levels of democracy (see Hartwell 2014), and the level of domestic credit, on the basis that credit availability would influence the size of the financial sector (as well as the private sector), altering the calculus for institutional reform in a crisis situation. In regards to the ROE regression, bank liberalization is also included, as is the lag of capital adequacy (which may be more relevant in the ROE model for

Table 9 Bayesian model averaging results including capital adequacy

ROA			ROE			
Variable	t	pip	Variable	t	pip	
Constant	4.03	1.00	Constant	0.07	1.00	Focus variables
Contract-intensive money	−1.57	1.00	Contract-intensive money	−0.08	1.00	
Investor protection	3.82	1.00	Investor Protection	3.68	1.00	
Democratic accountability	−3.43	1.00	Democratic Accountability	−1.38	1.00	
Size	−1.23	0.66	Size	0.34	0.44	Auxiliary variables
Operating costs	−28.33	1.00	Operating Costs	−23.75	1.00	
Foreign ownership	0.17	0.04	Foreign Ownership	0.00	0.01	
Credit risk	−3.9	0.99	Credit Risk	0.14	0.02	
Capital adequacy	12.31	1.00	Capital Adequacy	−4.58	1.00	
Domestic credit	−0.55	0.27	Domestic Credit	−4.51	1.00	
Bank concentration	0.11	0.04	Bank Concentration	0.24	0.03	
Bank reform	0.12	0.03	Bank Reform	1.27	0.68	
Inflation	−0.92	0.52	Inflation	−0.02	0.02	
M2 growth	−0.11	0.02	M2 Growth	0.04	0.01	
GDP growth	3.98	0.97	GDP Growth	0.86	0.18	
Output gap	0.1	0.02	Output Gap	−0.07	0.03	
Trade to GDP	−0.57	0.30	Trade to GDP	−0.14	0.04	
Total tax rate	0.16	0.04	Total Tax Rate	−0.3	0.10	
Government size	0.92	0.51	Government Size	3.76	1.00	
Population density	0.07	0.02	Population Density	−0.92	0.55	
US monetary policy	0.44	0.19	US Monetary Policy	1.48	0.75	

determining the current level of capital adequacy).[5] Finally, government growth is also included in the ROE model on the basis that changes in government during the global financial crisis could have had an impact on democracy and property rights; rather, growth of government in previous periods could have been a signal for the diminution of investor protection in later periods, and perhaps a lessening of democracy as well. Government growth may also have had an impact on capital adequacy decisions by banks, as larger governments may be able to require more capital from banks (similar to Agoraki *et al.'s* (2011) instrument strategy).

Correcting for the reality of endogeneity, the IV-GMM fixed-effects regression is shown in Table 10. In Column 1, using the instruments detailed above for ROA, investor protection remains the largest positive institutional determinant of bank profitability, with every move towards greater investor protection resulting in approximately half a percentage point increase in ROA. Perhaps somewhat reassuringly, the issue of democratic accountability disappears, as democracy enters as positive and marginally

[5] The lag of capital adequacy was not utilized in the ROA regression as diagnostics revealed it to be highly unsuitable as an instrument. As one example, the inclusion of the lag of capital adequacy reduced the *p*-value of the Hansen J-statistic to 0.000 from the level seen in the IV-GMM regression shown in Table 10, Column 1.

Table 10 IV-GMM regressions, determinants of bank profitability

	Dependent variable	
	ROA	ROE
	1	2
Institutional indicators		
Democratic accountability	0.25	−1.47
	*1.89**	*1.02*
Investor protection	0.53	1.83
	*5.20***	*2.76***
Contract-intensive money	−0.96	−2.74
	0.97	*0.40*
Left-wing government		−7.18
		*2.58***
Left-wing*democracy		1.10
		1.41
Bank specific		
Operating costs	−0.04	−0.23
	*9.52***	*7.62***
Capital adequacy	0.02	−0.13
	*2.90***	*2.93***
Industry-specific		
Domestic credit		−0.22
		*3.80***
Bank reform		1.97
		0.49
Macro/country-specific indicators		
GDP growth	0.10	0.51
	*6.70***	*4.74***
Government size		0.77
		*3.30***
US monetary policy		24.31
		*2.76***
C	−7.59	6.81
	*2.81***	*0.76*
n	7994	7273
Kleibergen-Papp underidentification (p)	0.0000	0.0000
Hansen J statistic (p)	0.7904	0.8071
C-statistic for exogeneity of instrument (p)	0.4964	0.8221
Endogeneity test (p)	0.0000	0.0592
Instruments	Lags of contract-intensive money, investor protection, democracy, bank liberalization, and domestic credit	Lags of contract-intensive money, investor protection, democracy, capital adequacy, bank liberalization and government growth

Absolute value of t-stats shown underneath coefficients; * denotes significance at the 10 % level and ** at the 1 % level. Two-step regressions with robust standard errors

significant, perhaps suggesting that the real channel political institutions work through is via regulations on banks.[6] Column 2 repeats the analysis for ROE, and the results confirm that democracy is indeed (at least in the crisis period) bad for a bank's return on equity, although it is also insignificant; more importantly, the presence of a left-wing government is highly and negatively significant, suggesting that the election of a left-wing government reduced bank profitability by as much as 7 % of its ROE.

These results are bolstered by the first-stage regressions and post-estimation tests confirming the strength and exogeneity of instruments. In each regression, as shown in Table 10, the Kleibergen-Paap under-identification tests are conclusively rejected, while the Hansen J-statistic shows a comfortable acceptance of the null of validity of the instruments. Moreover, both the C-statistic exogeneity test of the instruments and the testing of the joint endogeneity of the regressors (implemented as a difference in Sargan-Hansen statistics tests) shows that the instruments are safely exogenous while the suspect variables exhibit endogeneity. Finally, results from the first-stage regressions support the choice of instruments: for both regressions, the Anderson-Rubin Wald test and the Stock-Wright LM S-statistic for weak instruments show a p-value of 0.000, while the individual F-tests on each endogenous regressor also conclusively rejects the null of weak instrumentation (with F-statistic ranging from 66 for capital adequacy to over 15,000 for democracy). Thus, we can safely conclude that our instruments pass all econometric tests for relevance and exogeneity.

5 Conclusions

This paper has taken a new look at the drivers of bank profitability in transition, focusing on the role of institutions during the global financial crisis. The results over the various specifications suggest that bank-specific attributes remain important, but that institutional factors appeared to be more important than country-specific policies for explaining bank performance. Investor protection, in particular, was a positive explanator of bank profitability for both ROA and ROE across all specifications, an effect that was most pronounced during the global financial crisis. Overall democratic accountability, on the other hand, appeared to be an overall hindrance to profitability, although this effect vanished when controlling for bank concentration. Further analysis revealed that the presence of a left-wing government over the period of the global financial crisis hindered return on equity. In any event, these effects were dwarfed by the impact of US monetary policy during the crisis, suggesting that a bank's ROE was dependent not on bank-, industry-, or country-specific attributes, but by policies undertaken thousands of miles away.

The implications of this analysis are both simple and complex: in the first instance, any strengthening of property rights specifically concerned with investor protection is good for the economy in general and for bank profitability specifically, and thus banks should be in favor of such policies. This is the

[6] This supposition is not tested here but is a topic for future research.

simple implication. The more complex part comes in relation to the political institutions, which show a clear negative effect for democracy and left-wing governments on bank profitability. In such an environment, banks should perhaps be prepared to move out of debt leverage and into other vehicles, in order to maintain profitability. In either case, banks should look at cutting operating costs and increasing capital adequacy to deal with the unexpected. In particular, if bank profitability in a crisis is dependent upon forces beyond even national policymakers' controls (i.e. US monetary policy), a bank should deal with its own in-house issues and lobby for better property rights rather than wait for the benevolence of the Fed to save them.

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