

Does Government Ownership Negatively Affect Soundness of Banks? New Evidence

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Abstract

Some research has concluded that government ownership of banks negatively affects their soundness. Bretton Wood institutions have used these conclusions to advocate for state-owned banks privatization. This paper shows that this research was weak in the way it controlled for fundamental determinants of soundness of banks, and lacked rigorous econometric analysis. With data covering 2001-2009 we showed that if there is any relationship between government ownership of banks and their subsequent soundness, it is positive. These results are robust to various measures of financial development, institutional quality and econometric approaches.

Key Words: Government Ownership, Banks, Financial Development, Quality of Institutions, Financial Liberalisation.

Introduction

Despite the wave of bank privatization in the 70-80's, recent studies have shown that government ownership of banks is still significant throughout the world. According to La Porta, Lopez-de-Silanes and Shleifer (2002), hence forth called LLS, the world mean of government ownership of banks in 1970 was 58.9% while it only reduced to 41.6% in 1995. They also emphasized that government ownership of banks was more common in poor countries with poorly protected property rights. Most importantly, they argued that every 10% reduction in government ownership of banks would lead to a 0.24 % point increase in annual economic growth. The LLS conclusions were used by Bretton Wood institutions as evidence to support their recommendations to developing countries that privatising their banks would lead to healthier financial sectors and higher economic growth. However, this view became somehow questionable after the 2008 economic crisis with countries like the UK and US, where government ownership of banks was almost inexistent, taking over majority ownership in most of affected banks through bailout. This situation has brought back to the fore front the discussion of knowing whether government ownership of banks per se negatively affects their subsequent soundness and development. This paper contributes to this debate. Our main argument is that, contrary to LLS conclusions, government ownership of banks is only a scapegoat for a bigger problem of poor governance and ineffective or weak institutions as well as poor or lack of financial reforms.

This study builds on LLS paper and we mainly use their dataset especially in the first part. Our first contribution to the debate resides in demonstrating that LLS results are fragile to controlling for variables that the literature has demonstrated to be fundamental determinants of soundness of banks and financial sector development but which LLS omitted to use. To their OLS regressions we add institutional quality

variables such as control of corruption or bureaucratic quality from their own dataset. We also add the financial reform index from Abiad et al. (2008).

The positive correlation that arises in a cross-country relationship between government ownership of banks and financial crises frequently reflects reverse causality. Similarly, reverse causality between institutional development and financial sector development cannot be ruled out. Thus, our second contribution resides in accounting for possible endogeneity by using various instrumental variable approaches, while LLS based their conclusions on OLS regressions only.

Furthermore, we conduct various robustness checks including using various econometric estimation methods (OLS, IV 2SLS, LIML, heteroscedasticity robust GMM, iterative GMM, IVREG2 and CONDIVREG), different measures of institutional quality as well as various measures of soundness of banks. We find that in many cases, government ownership of banks is not a significant determinant of their subsequent soundness and in case where that relationship exists especially when we define soundness of banks in terms of loan availability, it is significantly positive. Moreover, financial reform and strong institutions are consistently found to be statistically and significantly linked to a strong banking sector.

The third and main contribution of this paper lies in using a recent dataset from 2001-2009 and broadening our definition to focus on financial development rather than soundness of banks' balance sheets to test the validity of our results. Our findings confirm our hypothesis that government ownership of banks, strong institutions and financial liberalization are associated with greater subsequent financial development. These results are robust to various measurements of financial development and institutional quality as well as different econometric approaches.

The paper is structured as follows: Section 2 discusses the two main views of government ownership of banks, i.e. the development view (with its associate social view) and the political view (with its associate agency view). Section 3 gives an overview of the literature about the determinants of financial instability and the role of government ownership of banks. Section 4 discusses our methodology which also involves description of our data, their sources and our econometric model. Section 5 presents the results of our analysis using LLS dataset with our added variables. Section 6 introduces our new dataset (covering the period 2001-2009), describes our new variables and their sources and presents our new results. Finally, section 7 concludes.

Development vs Political View of Government Ownership of Banks

In exploring the impact of government ownership of banks on economic performance, two competing hypotheses offer contradictory predictions. These are the political/agency view and the development/ social view.

Development View

The development view was largely advocated by Gerschenkron (1962). This view purports that government ownership of banks is necessary to enable government to both collect and direct savings towards strategic projects. This allows the government to overcome institutional failures that undermine private capital markets, and to generate aggregate demand and other externalities that foster growth. Thus banks ownership allows the government to jump starting both financial and economic development. Indeed, investigating how bank ownership influenced credit supply during the 2008 financial crisis in Russia, Fungáčová et al. (2013) demonstrated that although there was an overall reduction in lending, state-owned banks' reduction was far less than the one by privately owned banks. This reinforced the feeling that in economic downturn periods, government owned banks may bolster their lending and as such better support the economy. Other economists who support this view include Lewis (1950) and Myrdal (1968) who advocated for nationalization; Andrianova et al. (2008) who used the circular city model to show that when

contract enforcement in the private sector is weak, government owned banks are more effective in mobilizing savings than the privately owned ones. Furthermore, Andrianova et al.(2009: p.15) demonstrated that actually government ownership of banks is associated with subsequent economic growth and advocated for the government owned banks to continue to play their developmental role both in developed and developing worlds by “containing extreme moral hazard behaviours” that are thought to be at the origin of the current economic crisis. Andrianova et al. (2012:p463) used data for 128 countries for the period 1995-2007 to conclude that “...conditioning on other determinants of growth, countries with government owned banks have, on average, grown faster than countries with no or little government ownership of banks.”

Using data for 225 banks from 11 transition economies, Bonin et al. (2004) showed that privatization by itself is not enough to increase bank efficiency as government-owned banks are not appreciably less efficient than domestic private banks. Similarly, in their study on the German banking market, Altumbas et al. (2001:p21) did not find enough evidence to suggest that privately owned banks are more efficient than public ones but concluded that "inefficiency measures indicate that public banks have slight cost and profit advantage over their private sector competitors". Actually, Detragiache et al. (2005) use data for 89 low and lower middle income countries and find that public ownership of banks is associated with more subsequent efficient banking sector and a better deposit mobilization even after controlling for market size and concentration.

Close to this view, is the social view which is based on the economic theory of institutions, suggesting that whenever the social benefits of state-owned enterprises (SOEs) exceed the costs, state-owned enterprises are created to address market failures (Atkinson and Stiglitz, 1980). According to this view, SOEs in general and government-owned banks in particular contribute to economic development and improve general welfare by compensating for market imperfections that leave socially desirable projects underfinanced (Stiglitz, 1993). In brief, the advocates of state ownership of banks advance the following reasons: First, maintaining the safety and soundness of the banking system; second, mitigating market failures due to the presence of costly and asymmetric information; third, financing socially valuable but financially unprofitable projects; and finally promoting financial development and giving access to competitive banking services to residents of isolated areas.

Political View

On the other hand, the political view of government ownership of banks suggests that politicians prefer governments to own banks because this enables them to direct credit and favors, helping them to attract votes, political contributions and bribes in return. According to this view, government ownership of banks leads to economic inefficiency by politicizing the allocation of resources, enabling it to finance projects that are politically desirable but economically unviable. Other economists who support this view include (Khawaja and Mian, 2005; Faccio, 2006; Claessens et al. 2008) who argue that, although politically connected firms are less likely to repay their loans, they receive larger loans from state banks and pay interests rates that are comparable to those paid by non-politically connected firms that are otherwise more likely to pay back their loans. In the same vein, analyzing the political influence on state owned banks in Germany, Vins (2008) used data on 457 banks from the period 1994-2006 and information on 1,250 local elections to show that savings banks give significantly more loans to their corporate and private customers in the run up to an election and the probability that they lay off staff, close branches or engage in merger activity is significantly reduced in the approach of an election. Similarly, Cole (2007) showed that agricultural lending in India increases by 10% during election years and it is mostly directed to “close” constituencies.

Very close to the political view, is the agency view which, while recognising the existence of market imperfections that may justify the creation of SOEs, highlights the fact that agency costs within government bureaucracies may more than offset the social gains of public participation. Among economists

who support this view, there is Banerjee (1997) who developed a theoretical model showing why government bureaucracies are usually associated with red tape, corruption and lack of incentives; Shleifer and Vishny (1994), Shleifer (1998) who see SOEs as a means for politicians to transfer resources to their cronies.

The political view gained prominence in a well-known paper “Government Ownership of Banks”, by LLS. They used data on ownership of banks for 92 countries and concluded that Government ownership of banks in 1970 led to subsequent unsoundness and fragility of the banking sector. They further suggest that a 0.23 % point increase in annual growth would result from every 10% reduction in government banks. They also suggest that a 10% point increase in government ownership leads to an annual reduction of 0.1% in productivity growth.

Their conclusions were used by the Bretton Wood institutions to convince governments especially in developing countries to massively privatize their banks, in order to pave way for a sound banking sector and economic growth. For instance, basing on LLS regressions, the World Bank (2001:p127) said of Bangladesh that “... had the share of government ownership in Bangladesh been at the sample mean (57 per cent) throughout the period from 1970 instead of at 100 per cent, annual average growth would have risen by about 1.4 per cent, cumulating to a standard of living more than 50 per cent higher than it is today.” In the same report (p 123), the World Bank refers to LLS and argues: “research shows that, whatever its original objectives, publicownership tends to stunt financial sector development, thereby contributing to slower growth”.

However a close look at the LLS paper reveals that it suffers from omitted variable bias. While the literature suggests that the main determinants of financial stability include financial reforms and political and legal institutions (Beck et al.:2003a, Chinn and Ito: 2006, McDonald and Schumacher: 2007, Roe and Siegel: 2009) etc., the econometric analysis that led to LLS conclusions does not take them into account. In addition, while they find a strong correlation between government ownership of banks and other factors that influence growth such as the rule of law, protection of property rights and tax rate, the inclusion of these factors in their regression model makes the coefficient on government ownership statistically indistinguishable from zero.

In this paper, we conduct the same analysis as LLS paying due regard to those two determinants of soundness of the financial sector. We find that in presence of good quality institutions and financial reforms not only, government ownership of banks is not negatively correlated with subsequent soundness of banks but in fact, it may be positively associated with greater financial development and stability. However, before conducting our analysis, it is important to explore the determinants of financial instability by looking at the evidence from the literature

Determinants of Financial Instability and the Role of Government Ownership of Banks: A Brief Literature Review

Defining financial instability has proven a difficult task for economists. For the purpose of this paper, we will refer to financial instability in general terms as stipulated by the following two definitions. Allen and Wood (2006:p159) define financial instability as “episodes in which a large number of parties, whether they are households, companies or (individual) governments, experience financial crises which are not warranted by their previous behaviour and where these crises collectively have seriously adverse macro-economic effects”. On the other hand, in his definition, Mishkin (1999:p6) emphasizes the intermediation role of the financial system in providing credit to the real sector and states that “financial instability occurs when shocks to the financial system interfere with information flow so that the financial system can no longer do its job of channelling funds to those with productive investment opportunities”. To our knowledge, apart from the attempt by LLS, no study has so far clearly established a direct association between government ownership of banks and the prevalence of financial instability. Most actually do not

even mention it as a cause. Studying the determinants of financial instability, Eichengreen (2004) singled out the following four main causes: unsustainable macroeconomic policies including monetary, fiscal and exchange rate policies; fragile financial systems including inadequate prudential supervision, insufficient capital base, and poor risk management; institutional weaknesses; and flaws in the structure of the international financial markets. Many studies have concluded that financial liberalization is an important cause of financial crisis. In the aftermath of the Asian crisis for instance, Stiglitz (1998) wrote that financial and capital market liberalization which was done hurriedly before putting in place effective regulatory framework was the cause of the crisis. Caprio and Summers (1993), Hellman et al. (1994) all show that financial liberalization tends to make banking crises more likely because it leads to increased moral hazard. This argument was supported by Demirguc-Kunt and Detragiache (1997, 1998) who concluded that banking crises are more likely to occur in liberalized financial systems. They also found that a weak macroeconomic environment i.e. low GDP growth, high inflation, high real interest rates, vulnerable balance of payments as well as the existence of deposit insurance and inefficiency in law enforcement are likely to lead to financial crisis.

Poor financial regulation and supervision can also lead to financial instability. In fact the literature seems to be in agreement that the latest financial crisis mainly came as a result of poor financial sector regulation. According to Andrianova et al.(2010) in the last two decades the poorly designed Basle approach towards financial regulation has allowed for regulatory capture in financial markets rendering banking regulation and supervision ineffective. Regulation and supervision were slow to catch up with new developments, in part due to political processes and capture, and failed to restrict excessive risk-taking. In the shadow banking system in particular but also at large, internationally active banks were permitted to grow without much oversight, leading eventually to both bank and nonbank financial instability (Wellink, 2009).

In brief, various studies have identified the main determinants of financial crises as macroeconomic shocks, poor bank management, sharp increase in short-term interest rates, exchange rate regime, lending booms, currency mismatches, inappropriate incentive structure such as the existence of ill-designed deposit insurance schemes, financial liberalization, weak institutions and inadequate legal infrastructure and external economic conditions (Caprio et al. 2000).

As earlier mentioned, LLS is the first paper to purport a direct link between government ownership of banks and financial sector instability. However, despite the existence of a large literature on the relationship between government ownership and economic performance as shown above, the debate about the relationship between government ownership of banks and banking sector instability is not abundant. This debate is far from reaching a consensus to the point that even some respectable economists such as Barth, Caprio and Levine arrive at contradicting conclusions in their different works. For instance Barth et al.(2004) using a dataset on bank regulation and supervision in 107 countries to assess the relationship between specific regulatory and supervisory practices and banking-sector development and fragility concluded that, after controlling for bank regulation, there is no correlation between state ownership of banks and financial instability. On the other hand Barth et al.(2000) used a sample of 59 developed and developing countries and found a negative relationship between state-ownership and financial depth as measured by the ratios of bank and non-bank credit to the private sector over GDP, and by the value of securities traded domestically. In support of LLS, Caprio and Peria (2000), use the LLS data on government ownership of banks in a sample of 64 countries and found that greater government ownership does increase the likelihood of banking crises. However, their model does not control for important institutional factors such as the rule of law, property rights, and government efficiency. In addition the finding that higher government ownership of banks increases the costs of banking crises is not statistically significant.

All the above studies agree that government ownership of banks is more prevalent in poor countries with poor institutions, a situation that is prone to crisis by itself. The fact that they fail to control for this

situation may justify why they all find a weak but positive causal relationship between the state ownership and financial instability.

Furthermore, this discussion seems more complicated because although financial instability may result from different factors including government ownership as per LLS and company, the later also can come as a result of the former especially when there is a financial crisis and the government has to intervene to save the affected banks. So the direction of the relationship has always been a problem. The 2008 crisis has reinforced the pro- government ownership opinion by exposing the failure of regulation as well as the opportunistic behaviour of some private bankers who undertook too much risk to maximize their own selfish profits (Blundell-Wignall et al. 2009). This view is held by many economists including Shortland (2012) who says "The positive correlation that arises in a cross-country relationship between government ownership of banks and financial crises frequently reflects reverse causality: private banks that fail end up under government ownership because no other investor would buy them, and the political costs to governments of allowing banks to fail are often too high. Moreover, the financial crises that precede government takeovers of banks are normally followed by a severe recession, or at least slow economic growth. To ascribe the blame to governments is like arguing that hospitals are the causes of ill health because they are associated with illness. To claim that government banks should be privatized on the basis of such evidence is like arguing that by closing down hospitals you can improve the health of the general population".

Similarly, analyzing the effect of ownership structure on financial stability in Germany, Beck et al. (2009) used bank level data for 3,810 banks covering the period 1995-2007 and concluded that savings banks (government owned) are more stable than private banks. In the same vein, Barth et al. (2006) demonstrated that less accountable countries have more restricted bank entry and more constrained access to finance but concluded that there is no correlation between state ownership of banks and financial instability. Furthermore, Garcia Marco et al. (2008) analyses the risk taking behaviour of Spanish banks and find that Spanish commercial banks are less stable than savings banks that are government owned.

Studying the relationship between instability and bank ownership, Morck et al. (2011) find that the share of nonperforming loans and the probability of a major banking crisis increase in the share of family owned banks, while the share of state banks is not significant. They also find that family control of the banking sector is significantly correlated with slower economic and productivity growth, greater financial instability, and worse income inequality, while state controlled banking systems do not. In addition, according to Perotti and Vorage (2010), large banking crises are not more common in systems that are dominated by state banks. In fact, the literature shows that a move from state to private ownership of banks, especially to a few well connected owners, is often followed by financial crises. This was the case in Chile (1981), Mexico (1994), Asia (1997) and Russia (1998) where crises resulted from defaults from politically connected borrowers who received large loans from private banks (Bongini et al. 2001).

However, Yeyati et al. (2004) draw a more cautious conclusion that while public banks generally tend to be less efficient than privately owned banks (with higher non-performing loans, more loans to the public sector, higher overheads, and lower returns) they are also safer and as such able to pay lower rates on their deposits and extend credit at a lower rate. Although this may happen because of subsidies that the state-banks receive from government, it is also important to bear in mind that a state owned bank may not be primarily interested in making profits but in maximizing social welfare, making it difficult to compare its performance with the one of a privately owned profit maximizing bank.

Therefore it may be argued that studies that found negative relationship between government ownership and financial sector performance as opposed to the impact of private ownership may not have been comparing the like with the like. In fact Micco et al. (2007) find that while state owned banks in developing countries tend to be less profitable than their counterparts in developed world, there is no strong correlation between ownership and performance for banks located in developed countries. Similarly, Wen (2010) uses

data on 45 Chinese banks for the period 2003-2008 and finds no difference in performance between state and privately owned banks.

Given the contradictory evidence in the literature, the debate about the relationship between government ownership of banks and subsequent financial instability is a non-settled issue. This paper is intended to contribute to that literature by using a recent dataset, controlling for various factors that have been found to contribute to financial stability and by using different econometric approaches that account for endogeneity.

Methodology, Data and Sources

This paper seeks to investigate the hypothesis whether government ownership of banks leads to subsequent unsoundness of the financial sector. Our methodology is as follows: In the first part and for comparability with LLS, we mainly use their dataset available at their website¹. A part from financial reform index, other variables are similar to LLS. After reproducing LLS results using OLS in table 3, we show how they are fragile by adding corruption control (*corrupt*) and the financial reform index (*finref*) as other explanatory variables separately and then together. We then use more sophisticated econometric estimation methods to attend to endogeneity problems and conduct various robustness checks. In the second part we use the same econometric methods but now construct a recent dataset from 2001-2009. We also use 3 broader definitions of financial development (private credit, liquid liability and financial system deposits as a percentage of GDP rather than soundness of banks).

Data, Sources and Descriptive Statistics

Dependent Variable

Soundness of banks (*sndbks99*): As a measure of financial stability LLS used the "soundness of banks" indicator which they defined as the "index of World Competitiveness Report (WCR) assessing the soundness of banks in terms of their general health and sound balance sheets". It is measured on a 1-7 scale with 1 representing insolvent banking system that may require a government bailout; 7 meaning generally healthy banking system with sound balance sheets. We use the same variable.

Furthermore, in their study, LLS measured different indicators of financial sector development. Among those, only loan availability (*loanav99*) refers to the year 1999 as the soundness of bank indicator. So, for robustness check, we use this variable in our study as an alternative measure of financial stability. They describe it as an index of WCR's assessment of the "relative easiness to obtain loans without a business plan and no collateral." It is measured on a scale from 1 to 7, where higher scores indicate stronger agreement with that statement.

Explanatory Variables

In their OLS, LLS basically regressed the soundness of banks variable (*sndbks99*) on the left hand side and the explanatory variables GB70 (*gbbp_70* i.e. share of the assets of the top 10 banks in a given country owned by the government of that country in 1970), Log GDP per capita in 1960 (*logy60f* expressed in current USD in 1960), and Initial private credit/GDP (*prif_i60*) on the right hand side. We use the same dataset. LLS collected data on government efficiency indicators including corruption control from the "Political Risk Services" (1996) dataset. Their corruption index (*corrupt*) is scaled from 0-10 with Low ratings indicating that "high government officials are likely to demand special payments" and "illegal payments are generally expected throughout lower levels of government" in the form of "bribes connected with import and export licenses, exchange controls, tax assessment, policy protection, or loans." Then they

¹ <http://mba.tuck.dartmouth.edu/pages/faculty/rafael.laporta/publications.html>

did an average of the months of April and October of the monthly index between 1982 and 1995. They also gathered data on the bureaucratic quality index (*bqualitt*) which they got from the same source and used the same methodology to construct i.e. scaled from 0-10 with higher scores indicating greater government efficiency. However, despite the large consensus in literature that poor institutional quality/ poor governance is detrimental to growth (La Porta et al. 1997, 1998; Andrianova et al. 2012; Acemoglu et al. 2001), they chose not to include any institutional quality indicator in their OLS regressions.

As above discussed, financial reform (*finref*) is an important determinant of financial stability. We use the financial reform index from Abiad et Al. (2008). This index is made of seven dimensions of financial reforms i.e. credit control (including aggregate credit ceilings and reserve requirements), interest rate liberalization, banking sector entry, capital account transactions, privatization, securities markets and banking sector supervision. Each dimension has various sub dimensions. Based on the score for each sub dimension, each dimension receives a 'raw score' which is then normalized to a 0-3 scale. That is, fully liberalized = 3; partially liberalized = 2; partially repressed = 1; fully repressed = 0. Then all the 7 indicators are added together making an index scaled from 0-21 which is then normalised to take values between 0 and 1.

We use data for 1995 following Demirguc-Kunt and Detragiache (1998) who, studying the determinants of banking crises concluded that the effect of financial liberalization is not immediate and is felt on average after 3-4 years. Thus, since we wanted to measure its effect on soundness of banks in 1999, we used our financial reform index for 1995. Our index is better than most of those used in previous studies because it combines all possible dimensions of financial reform, while most of previous studies used one or a few dimensions.

Other variables used in our study as instruments are all from LLS dataset too. They are *coups_av* described as the number of extra constitutional or forced changes in the top government elite and/or its effective control of the nation's power structure in a given year. The data covers the 1960s, 1970s, and 1980s. Another instrument used is *lat_abst* i.e. the absolute value of the latitude of the country, scaled to take values between 0 and 1. We also used a dummy variable *comlaw* which takes values of 1 if we have common law and 0 if we have civil or socialist legal systems.

Descriptive Statistics

Table1: Summary of variables

Variable	Obs	Mean	Std. Dev.	Min	Max
sndbks99	59	4.594	1.454	1.74	6.66
corrupt	126	5.653	2.294	0.178	10
logy60f	91	5.858	0.988	3.931	8.670
prif_i60	89	0.249	0.225	0.000	1.295
finref	87	0.626	0.219	0.095	1
gbbp_70	92	0.588	0.353	0	1
coups_av	146	0.047	0.169	0	1
lat_abst	209	0.280	0.188	0	0.8
comlaw	212	0.344	0.476	0	1

In table 2 we show the correlation between our variables. The correlation between *corrupt* and *logy60f* is 0.829. This makes sense, since those countries that fight corruption are deemed to grow faster. The negative correlation between *corrupt* and *gbbp_70* on the one hand and between *finref* and *gbbp_70* on the other, suggest that countries where a big fraction of banks was in the hand of the government are the same that continued to resist financial reform and control of corruption. This is in line with the literature. Looking at

the correlation between our endogenous variable *corrupt* and our instruments, the table shows correlation between control of corruption *corrupt* and *lat_abst* is strikingly positive at 0.691. This is also in line with the literature as mentioned above, according to which countries in tropical areas are more likely to have poor institutions. Similarly, control of corruption *corrupt* is negatively correlated with *coups_av* meaning corruption is rampant in those countries where coups prevail.

Table 2: Correlation between variables

	sndbks99	corrupt	logy60f	prif_i60	finref	gbbp_70	coups_av	lat_abst	comlaw
sndbks99	1								
corrupt	0.675	1							
logy60f	0.695	0.829	1						
prif_i60	0.290	0.483	0.377	1					
finref	0.563	0.485	0.565	0.240	1				
gbbp_70	-0.388	-0.466	-0.383	-0.178	-0.600	1			
coups_av	-0.295	-0.369	-0.302	-0.192	-0.025	0.098	1		
lat_abst	0.560	0.691	0.657	0.445	0.486	-0.239	-0.068	1	
comlaw	0.262	0.248	0.127	-0.266	0.098	-0.518	-0.199	-0.078	1

Empirical Model and Econometric Analysis

Empirical Model

Our general model is the same as the one used by LLS i.e.

$FD_{99} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_n X_n + \varepsilon$ where FD_{99} is the measure of soundness of banks in 1999 and $X_1, X_2 \dots X_n$ are explanatory variables; ε is the error term. Specifically, LLS model is as follows: $sndbks99 = \beta_0 + \beta_1 gbbp_70 + \beta_2 logy60f + \beta_3 prif_i60 + \varepsilon$ where *sndbks99* is the soundness of banks in 1999, *gbbp_70* is government ownership of banks in 1970, *logy60f* is Log GDP per capita in 1960 and *prif_i60* is the initial private credit/GDP. We use the same model and add two other variables i.e. financial reform index in 1995 (*finref*) and control of corruption/bureaucratic quality (*corrupt/bqualitt*) as explained above. So our model will be as follows:

$$sdbks99 = \beta_0 + \beta_1 gbbp_70 + \beta_2 logy60f + \beta_3 prif_i60 + \beta_4 corrupt + \beta_5 finref + \varepsilon$$

Econometric Analysis

We use various econometric methods. For comparability with LLS we first use the OLS regressions. To account for possible endogeneity we then use Instrumental variables 2SLS, GMM, and IVREG2. We further use the other two versions of IV namely LIML (Limited Information Maximum Likelihood) and Conditional IV regression (CONDIVREG) which have an advantage of working well even when instruments are weak. Our endogenous variable is control of corruption (*corrupt*) as a measure of institutional quality while our instruments are *coups_av*, *lat_abst* and *comlaw* as described above. We chose these instruments in line with the literature. We chose *Lat_abst* following Acemoglu et al. (2001) who demonstrated that the disease environment that faced the settlers from colonising powers played a crucial role in shaping the nature of institutions in those colonies. They suggested that the inhospitable character of tropical areas led to settlers opting for extractive institutions. It is reasonable to assume that this geographical parameter can only influence the financial sector soundness through institutions. It shows the absolute distance of a country from the equator. The closer to the equator countries are, the more tropical climate they have. *Comlaw* dummy was also chosen following the literature including La Porta et

al. (1997, 1998) who argue that the origin of the legal code directly determines the way shareholders and creditors are treated as well as the level of contract enforcement. According to them, countries with a British legal origin tend to be less corrupt and protect the property right better than those with legal systems of French origin. Thus we believe that legal origin affects financial development through institutional quality. As for the average of coups *coups_av* instrument, we followed Barro (1991) who used an objective count of instances of political instability such as coup d'état to proxy the threat to property rights. In addition, we conducted four further tests namely test of multicollinearity (which confirmed its absence), test of endogeneity, the test for weak instruments, and the Hansen's test of over identification restrictions.

Empirical Results

Fragility of LLS Results

In table 3, model LLS, we reproduce the LLS regression and obtain the same results. In the same table, in model OLS1 we add *corrupt* to LLS' OLS regression. Government ownership immediately loses its significance and R^2 increases by 10 % (from 0.43 to 0.53). Its coefficient's magnitude changes downward from -1.242 to -0.458 i.e. a staggering 63% change. *Corrupt* becomes positive and significant at 5%. By adding *bqualitt* in the regression (model OLS2), *gbb_70*'s significance vanishes and R^2 increases from 0.43 to 0.51. The coefficient of *gbb_70* changes from -1.242 to -0.495 i.e. a 60% change downward. This trend is maintained if we use other governance indicators such as rule of law, tax compliance, property right indices, suggesting that governance has more impact than ownership. Since *corrupt* is highly correlated with all the above governance variables (0.821 with *bqualitt*, 0.801 with rule of law and 0.735 with contract repudiation index), we chose to use *corrupt* as a proxy variable for governance in our OLS and IV regressions.

Table 3: LLS regression and its fragility: Dependent variable is soundness of banks

	LLS	OLS1	OLS2	OLS3	OLS4
<i>gbbp_70</i>	-1.242** (-0.521)	-0.458 (-0.438)	-0.495 (-0.455)	-0.411 (-0.615)	0.092 (-0.565)
<i>prif_i60</i>	0.382 (-0.479)	0.029 (-0.461)	0.296 (-0.477)	0.666 (-0.421)	0.070 (-0.465)
<i>logy60f</i>	0.752*** (-0.156)	0.531** (-0.232)	0.765*** (-0.233)	0.746*** (-0.191)	0.416 (-0.285)
<i>corrupt</i>		0.216** (-0.105)			0.211* (-0.114)
<i>bqualitt</i>			0.076 (-0.087)		
<i>finref</i>				1.675 (-1.027)	1.937** (-0.899)
Constant	0.584 (-1.121)	0.209 (-1.049)	-0.282 (-1.093)	-1.057 (-1.212)	-0.772 (-1.236)
Observations	54	51	51	48	47
R-squared	0.43	0.53	0.51	0.51	0.56

Note: Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Similarly, if we introduce *finref* alone in the LLS regression (model OLS3), *gbbp_70* loses its significance and its coefficient's magnitude changes from -1.242 to -0.411. R^2 increases from 0.43 to 0.51. When we put

all our variables in a regression at the same time (model OLS4), *Gbbp_70* becomes positive but not significant and the magnitude of its coefficient drops dramatically to 0.092 from 1.242 as by the LLS model. Both *corrupt* and *finref* become significant at 10% and 5% respectively while R^2 increases from 0.4387 to 0.56 i.e. a staggering 13% increase. The downside of adding these two variables is that the number of observations drops from 54 to 47.

These results suggest that the LLS results are fragile to controlling for factors that the literature has demonstrated to be fundamental determinants of the soundness of the financial sector i.e. the quality of institutions and financial reforms. Our preliminary results therefore show that if institutions are strengthened and proper financial reforms are undertaken, the fact that government ownership of banks was high in 70s in any country does not really matter for the subsequent soundness of its banking sector. This is one of the main contributions of this paper.

Instrumental Variables

Given the popularity that the LLS conclusions enjoyed, we perform a number of robustness checks to establish whether the LLS results still hold. The first approach is to change the methodology by applying the instrumental variable and comparing the results thereof with those from OLS. In our study, reverse causality between institutional development and financial sector development cannot be ruled out as explained above. If endogeneity exists, then our OLS estimators are biased and inconsistent. The resulting regression estimates measure only the magnitude of association rather than the magnitude and direction of causation which is needed for policy decision. Moreover, according to Cameron and Trivedi (2009), if we use IV while the variables are all exogenous, then the IV estimators although consistent, they can be much less efficient than the OLS estimator. Thus it was necessary to test for endogeneity.

We test for endogeneity in two ways. First we use the Hausman test principle of comparing the OLS and IV estimators. According to Cameron and Trivedi (2009) if there is not much difference between the two estimators' results, then there is no need of using IV and we conclude that the variable was exogenous. Table 4 shows that the two estimates are very different. For instance, the coefficient for *corrupt* is 0.211 in OLS while it is 0.601 in IV 2SLS. Similarly, the coefficient for *gbbp_70* is 0.092 in OLS but increases to 0.667 when we use IV 2SLS. The coefficient for *finref* changes from 1.937 to 2.307. The second way of testing for endogeneity is using the robust Durbin-Wu-Hausman (DWH) test of endogeneity developed by Durbin (1954) Wu (1974) and Hausman (1978) and implemented by the *estat endogenous* stata command. This test produces a robust statistic because it uses a device of augmented regressors (Davidson 2000). In Table 4 the DWH test shows that we reject the null hypothesis that *corrupt* is exogenous at 10 % (since $p=0.062$) and thus conclude that it is endogenous.

We also conducted the Hansen's test for over identification restriction to confirm the validity and relevance of our instruments. The best way of doing it is using the IVREG2 estimator which, if applied on over identified model, yields the optimal GMM estimator with heteroscedastic errors (Cameron and Trivedi, 2009) but has the merit of producing at the same time the Hansen's J test and the Anderson Cannon likelihood ratio statistic as proposed by Anderson (1984) and discussed in Hall et al. (1996). Our results in Table 4 show that Hansen's J $\chi^2(2) = 0.745$ ($p = 0.689$). Given that our p-value is greater than 0.05 we do not reject the null hypothesis and conclude that our over identifying restriction is valid. Our test statistic is $\chi^2(2)$ distributed because we have $3-1=2$ over identifying restrictions. The Anderson Cannon LR statistic has a p-value of 0.003 and as such it rejects the null hypothesis at 1% suggesting that our instruments are valid.

The IV 2SLS results are presented in Table 4 as model TwoSLS. *Corrupt* and *finref* are both significant at 1% and *gbbp_70* is positive and not significant. The coefficients obtained from IV 2SLS are very different from those obtained from OLS. As expected when we compare the precision between OLS and IV 2sls, standards errors increase but in our case they do not increase dramatically even decreasing for *finref*.

Then we used the heteroscedasticity robust Generalised Method of Moments (GMM.het) and the iterative GMM (iGMM) for further robustness check. GMM estimation is an extension of the class of simple IV estimators and was introduced by Hansen (1982). According to Hansen (2007), they have been widely used for the following two reasons: first because they have large sample properties that are easy to characterise in ways that facilitate comparison and secondly they can be constructed without specifying the full data generating process (which for instance would be necessary to write down the maximum likelihood estimator). Finally, According to Baum et al. (2003) the GMM is more efficient than the IV 2SLS estimator especially when the error term is heteroscedastic, while in absence of heteroscedasticity, GMM is no worse asymptotically.

The GMM results are presented in Table 4 as model GMM-het. As with IV 2SLS, *corrupt* and *finref* are both significant at 1% and their coefficient are not very different from those from IV2SLS estimator. Here again *gbbp_70* is positive and not significant. Standard errors are also almost similar for the IV 2SLS model. Hall (2005) demonstrated that there may be gains to finite-sample efficiency from using the iterative estimator. This method is a bit different from the normal GMM. The normal GMM obtains parameter estimates based on the initial weight matrix. However given that the definition of the weight matrix for the first step is arbitrary, and different choices will lead to different point estimates in the second step, the iGMM improves on this drawback by computing a new weight matrix based on those estimates, re-estimates the parameter based on that weight matrix, computes a new weight matrix, and so on, till convergence is achieved.

The results from the iterative GMM are presented in Table 4 as model GMM_igmm. Again *corrupt* and *finref* are significant at 1% and their coefficients are very closely similar to those from IV 2SLS and GMM_het. Again *gbbp_70* is positive and not significant. Standards errors are also not very different. These results are supplemented by the IVREG2 results in model IVREG2. The user-written IVREG2 command has been described by Baum et al. (2003). It overlaps with the *ivregress* command but has the advantage of providing additional estimators and statistics. When it is applied to an over identified model, it yields the optimal GMM estimator when errors are heteroscedastic (Cameron and Trivedi, 2009).

To check whether our instruments are good determinants of our endogenous variable *corrupt* we use the IV2SLS estimator with the option *vce (robust)* to control for heteroscedasticity errors and with the “first option” as proposed by Cameron and Trivedi (2009). The first stage regression, as in table 5 shows that our instruments are good determinant of our endogenous variable and are all significant at 5%. We then conduct the test for weak instruments using the Stock & Yogo (2005) test as shown in Table 4. The test shows us that our instruments are weak since $F = 5.62506$. The rule of thumb as suggested by Staiger and Stock (1997) and supported by Stock and Yogo (2005) states that instruments are strong if the F statistics is greater than 10. The second test statistics proposed by Stock and Yogo (2005) is the minimum eigenvalue of the matrix analog of the F statistics. This statistics also shows us that our instruments are weak because our minimum eigenvalue is 4.41 while it should be greater than 13.91 with a 5% relative bias toleration.

Given that our instruments are valid as per our Hansen test results, but also cognisant that weak instruments may lead to biased IV estimators because the asymptotic identification of the equation becomes questionable, the above results led us to apply more sophisticated methods that are recommended when instruments are weak. These methods are the LIML (Limited Information Maximum Likelihood) estimator as described by Anderson and Rubin (1950) and the Conditional IV regression (Condivreg) developed by Mikusheva and Poi (2006). According to Pischke (2010) the LIML is asymptotically identical to 2SLS but superior as far as finite samples are concerned. It is a linear combination of OLS and 2SLS estimates with the weights depending on the data. The weights are such that they approximately eliminate the 2SLS bias. As far as the conditional approach is concerned, Cameron and Trivedi (2009) say that it focuses on inference on the coefficient of the endogenous regressor in the structural model with critical values, p-values and confidence intervals of asymptotically correct size, assuming i.i.d errors, no matter how weak the instruments are.

The LIML results are presented in Table 4 as model LIML. As in other models previously described, *corrupt* and *finref* are significant at 1% and *gbbp_70* is positive and not significant. The conditional IV regression results are presented in Table 4 as model CONDIVREG. Here again *corrupt* and *finref* are significant at 5% and 10% respectively, while *gbbp_70* is positive and not significant. Thus, across all the 6 IV models, coefficients, their significance levels and standard errors are almost similar (*corrupt* and *finref* are positive and significant while *gbbp_70* is positive but not significant).

Table 4: Instrumental Variables
Dependent variable is soundness of banks. Corrupt measures institutional quality

	OLS	TwoSLS	GMM_het	GMM_igmm	IVREG2	LIML	CONDIVREG
corrupt	0.211* (0.114)	0.601*** (0.218)	0.635*** (0.214)	0.631*** (0.214)	0.635*** (0.207)	0.626*** (0.233)	0.601** (0.285)
finref	1.937** (0.899)	2.307*** (0.849)	2.247*** (0.863)	2.246*** (0.863)	2.247*** (0.844)	2.337*** (0.865)	2.307* (1.215)
gbbp_70	0.092 (0.565)	0.667 (0.717)	0.654 (0.717)	0.64 (0.716)	0.654 (0.706)	0.703 (0.733)	0.667 (0.712)
N	47	45	45	45	45	45	45
R-sq.	0.56	0.46	0.44	0.44	0.44	0.44	0.46

Durbin Wu Hausman test: p=0.062; Hansen J statistic (over identification test of all instruments): 0.745 Chi-sq. (2) P = 0.689; Anderson canon. corr. LR statistic (identification/IV relevance test): 13.763 Chi-sq. (3) P = 0.003; Stock and Yogo Test for weak instruments: F=5.625; Minimum Eigenvalue: 4.41 with critical value of 13.91 at 5% for 2sls relative bias.

Note: Standard errors in parentheses; * p<0.10, ** p<0.05, *** p<0.01; Controls: *logy60f*, *prif_i60* and the constant included in the regressions; Excluded instruments: *coup_av*, *lat_abst* and *comlaw*.

Table 5: Validity of instrument using the first stage

corrupt	Coef.	Rob Std. Err.	t	P>t
logy60f	1.296	0.302	4.29	0.000
prif_i60	2.02	0.835	2.42	0.021
finref	-0.829	1.182	-0.7	0.487
gbbp_70	-0.67	0.695	-0.96	0.341
coups_av	-1.621	0.732	-2.21	0.033
lat_abst	3.17	1.182	2.68	0.011
comlaw	0.949	0.452	2.1	0.043

Further Robustness Check

Although at this point we are convinced that our results are robust, we went further to check how robust they are if we use a different measure of the soundness of banks. As mentioned earlier, in their dataset, LLS have different measures of soundness of banks. However the loan availability measure (*loanav99*) is the only one that is comparable to our soundness of banks (*sndbks99*). They are the only indicators for which LLS have data for the year 1999. The results are presented in Table 6 panel 1. We can observe that here *corrupt* and *finref* are positive and significant at 1% across all the models (except for LIML model where *finref* is significant at 5%). Most importantly here, *gbbp_70* becomes positive and significant at 1% in all

the IV models (except for LIML where it is significant at 5%) suggesting that actually, it is easy to get loan in countries where government ownership of banks was prevalent. The CONDIVREG estimator gives us similar results with *corrupt* and *finref* significant at 1 % and *gbbp_70* positive and significant at 5%. We get similar results when we use *bqualitt* instead of *corrupt* as shown in Table 6 panel 2 and panel 3.

Table 6: Robustness Checks

Panel 1: Using loan availability as dependent variable and corrupt as a measure of institutional quality

	OLS	TwoSLS	GMM_het	GMM_igmm	IVREG2	LIML	CONDIVREG
corrupt	0.304*** (0.061)	0.583*** (0.138)	0.596*** (0.137)	0.606*** (0.14)	0.596*** (0.131)	0.683*** (0.208)	0.583*** (0.149)
finref	1.541*** (0.411)	1.884*** (0.629)	1.930*** (0.618)	1.872*** (0.618)	1.930*** (0.619)	2.001** (0.782)	1.884*** (0.634)
gbbp_70	0.438* (0.23)	0.829*** (0.298)	0.864*** (0.308)	0.872*** (0.314)	0.864*** (0.295)	0.967** (0.384)	0.829** (0.372)
N	47	45	45	45	45	45	45
R-sq	0.732	0.589	0.569	0.553	0.569	0.471	0.589

Note: Standard errors in parentheses; * p<0.10, ** p<0.05, *** p<0.01; Controls: *logy60f*, *prif_i60* and the constant included in all the regressions; Excluded instruments: *coup_av*, *lat_abst* and *comlaw*.

Panel 2: Using Soundness of banks as dependent variable and bureaucratic quality as a measure of institutional quality.

	OLS	TwoSLS	LIML	GMM_het	GMM_igmm	IVREG2
Bqualitt	0.0507 (0.101)	0.465** (0.185)	0.470** (0.188)	0.460** (0.182)	0.458** (0.181)	0.460** (0.183)
Finref	1.731* (0.991)	1.955** (0.931)	1.960** (0.933)	1.900** (0.914)	1.897** (0.913)	1.900** (0.924)
gbbp_70	-0.0713 (0.620)	1.070 (0.883)	1.084 (0.889)	0.950 (0.836)	0.941 (0.835)	0.950 (0.839)
N	47	45	45	45	45	45
R-sq	0.541	0.369	0.365	0.372	0.374	0.372

These results would suggest that in countries that had higher levels of government owned banks in 70s that strengthened their institutions and undertook proper financial reforms, it is easier to get a loan without having to present collaterals than in countries where government ownership of banks was not prevalent in the 70s.

The above results are not surprising in themselves. What is surprising is the fact that we get them using almost exclusively the data collected by LLS themselves. LLS concluded that government ownership is more prevalent in countries with weak institutions. Similarly, Andrianova et al. (2008) argued that government ownership is a symptom of weak institutions. Thus failing to control for this phenomenon clearly allows government ownership to pick its effect and we simply get the LLS results whose correctness cannot be trusted.

Panel 3: Using loan availability as dependent variable and bureaucratic quality as a measure of institutional quality.

	OLS	TwoSLS	LIML	GMM_het	GMM_igmm	IVREG2
Bqualitt	0.196*** (0.0384)	0.405*** (0.108)	0.508*** (0.192)	0.419*** (0.111)	0.412*** (0.109)	0.419*** (0.108)
Finref	1.334*** (0.402)	1.507*** (0.367)	1.585*** (0.419)	1.635*** (0.399)	1.571*** (0.393)	1.635*** (0.362)
Gbbp_70	0.498** (0.245)	1.098*** (0.418)	1.369** (0.613)	1.242*** (0.425)	1.217*** (0.421)	1.242*** (0.411)
N	47	45	45	45	45	45
R-sq	0.685	0.580	0.435	0.558	0.565	0.558

Note: Standard errors in parentheses; * p<0.10, ** p<0.05, *** p<0.01; Controls: *logy60f*, *prif_i60* and the constant included in all the regressions; Excluded instruments: *coup_av*, *lat_abst* and *comlaw*.

Government Ownership of Banks and Financial Sector Development 2001-2009

This section aims at further testing the validity of our previous findings by using a more recent dataset from 2001-2009. While we use similar econometric approaches as in the previous section, we make important changes in measuring some of our variables. Most importantly, in the previous section, we followed LLS and used their data on soundness of banks as our dependent variable. This index was constructed by the World economic Forum following an executive survey, where private investors were asked to answer to the question: How would you assess the soundness of banks in your country? Their answers were ranked on a 1-7 scale with 1 representing insolvent banking system that may require a government bailout; 7 meaning generally healthy banking system with sound balance sheets. Such a survey may be subjective and may sometimes not be a good indicator of financial systems' soundness.

For instance, the World Economic Forum report (2009) gives a country like United Kingdom a score of 3.8 and 4.8 to Germany on the one hand while Malawi is given 5.8, Senegal 5.9 and Gambia 5.6. If we are talking about soundness of balance sheets, this may be understood especially given that in 2009 the financial crisis was biting in UK and Germany. However this clearly does not reflect the level of development of the financial sector and may simply be seen as a mere coincidence. Therefore, in this section we broaden our definition of soundness of banks to utilise 3 widely used definitions of financial development. These are private credit, liquid liability and financial system deposits as a percentage of GDP. These measures have been recently advocated as good indicators of financial development (Rajan and Zingales: 2003, Baltagi et al: 2009, etc.) and they allow us to widen our thinking on the role of government ownership of banks on financial development rather than narrowly focusing on an opinion survey about banks' balance sheets.

Furthermore, in the previous section we used government ownership of banks as defined by LLS i.e. share of the assets of the top 10 banks in a given country owned by the government of that country in 1970. In this section rather than focusing on top 10 banks, we define government ownership as the percentage of the banking system's assets in banks that are 50 % or more owned by the government. This is in line with previous research such as Andrianova et al (2009, 2012).

Data and Sources

Dependent Variable

Our dependent variable is *financial development*. In the literature various indicators have been used to measure financial development. In our study we will use three of the most used indicators from World Bank's Financial Structure and Financial Development Database by Beck et al. (2009). They are liquid liability to GDP (*llgdp*), private credit to GDP (*prcrgdp*) and financial system deposits to GDP (*depgdp*). Liquid liability to GDP measures the ability of the financial intermediaries (comprising of central bank, deposit money banks and other financial institutions) to mobilise funds or the size of the financial system relative to the economy. It is calculated as liquid liabilities of banks and non-bank financial intermediaries (currency plus demand and interest bearing liabilities) over GDP. On the other hand, private credit to GDP is defined as the credit issued to the private sector by banks and other financial intermediaries divided by GDP, excluding credit issued to government, government agencies and public enterprises, as well as the credit issued by the monetary authority and development banks. According to Rajan and Zingales (2003: p.9), it measures the "ease with which any entrepreneur or company with a sound project can obtain finance". As such a country is said to be less financially developed if there is little credit available for the private sector. Finally, we measured financial development in terms of financial system deposits as a percentage of GDP from the same database. They define it as the ratio of all checking, savings and time deposits in banks and banks-like institutions to economic activity. It is a stock indicator of deposits resources available to the financial sector for its lending activities.

Independent Variables

Government ownership of banks (gbb2001): we use data from the World Bank dataset on banking regulation and financial structure (Caprio et al. (2008). The variable measures the percentage of the banking system's assets in banks that are 50 % or more owned by the government as of year-end 2001. Although the data was also available for 1999, we chose to use the 2001 data because it is available for more countries i.e. 128 observations as opposed to 103 for 1999. The 2001 data also gives us more recent information as compared to 1999.

Financial reform (finref): We use financial reform from Abiad et al (2008) as described above. *Initial financial development* i.e. liquid liability to GDP or Private Credit to GDP or deposits by the financial systems to GDP in 2001. We used these initial conditions to account for convergence. *GDP per capita (gdppccst2000)*: This is another widely used determinant of financial development. We use the 2001 data i.e. beginning of the period data converted to US dollars based on 2000 constant prices. It is from the World Development Indicators dataset. *Institutional quality*: There is a consensus in the literature that the quality of institutions affects financial development (Baltagi et al, 2009; Law and Habibullah, 2009). Herger et al. (2008) defined institutional quality as the extent to which man-made procedures foster investor protection and enhance access to funds for entrepreneurs within financial exchanges. Investors rely on the state for enforcing contracts and protection. In countries where corrupt politicians/official abuse their authority for self-enrichment, investors are unwilling to invest or surrender funds with increasing risks of expropriation. This explains why these countries remain financially underdeveloped. To capture the quality of institutions we use control of corruption (*corricrgav*) and bureaucratic quality (*bqlticrgav*) from the international Country Risk Guide (ICRG) dataset. Control of corruption is scaled from 0-6 while bureaucratic quality is scaled from 0-4 with higher values indicating better institutions. Following LLS (2002), we averaged the data for the years 1991-2000.

For instrumental variables, we use similar instruments as in the previous analysis i.e. average number of coups covering the 60s, 70s and 80s (*coups_av*), distance from the equator as measured by the Latitude (*lat_abst*) and legal origin (*comlaw*) all from LLS (2002).

Table 7 shows the correlation between our variables. Correlation between *corricrgav* and *bqlticrgav* is 0.999 as expected. So we cannot use both of them in a regression because they seem to measure the same thing. We will be using either of them. As expected, there is a negative correlation between government ownership of banks and control of corruption and between government ownership of banks and financial reforms.

Table 7: Correlation between variables

	Corricrgav	bqlticrga	gbb2001	llgdp01	finref2005	gdppccst2000
Corricrgav	1.000					
bqlticrgav	0.999	1.000				
gbb2001	-0.309	-0.310	1.000			
llgdp01	0.501	0.493	0.118	1.000		
finref2005	0.014	0.007	-0.286	-0.235	1.000	
gdppccst2000	-0.095	-0.105	-0.199	0.087	0.070	1.000

Empirical Model

For comparability, we use a model that is as closer as possible to LLS.

$FD_{09} = \beta_0 + \beta_1 FD_{01} + B_2 X_2 + B_3 X_3 + B_4 X_4 + \dots + B_n X_n + \epsilon$ where FD_{09} is the measure of financial development in 2009, FD_{01} is the initial levels of financial development in 2001, and X_2, X_3, \dots, X_n are explanatory variables as explained above. Our main variables are *gbb2001*, *corricrgav* / *bqlticrgav* and *finref2005*.

Results

Our results using recent data confirm our conclusions when we used LLS data set with more robust econometric methods and controlling for institutional quality and financial reform. Different panels in Table 8 show our results using different estimation methods as explained in the previous section. These tables use different measures of financial development and institutional quality.

Table 8: Instrumental Variables

Panel 1: Dependent variable is Liquid Liability with control of corruption measuring quality of institution

	OLS	TwoSLS	LIML	GMM_het	GMM_igmm	IVREG2
Corricrgav	2.621 (3.230)	10.86** (4.480)	12.50** (5.195)	10.55** (4.287)	12.38*** (4.257)	10.55** (4.286)
Gbb2001	59.65*** (13.94)	78.52*** (17.51)	82.70*** (18.87)	78.91*** (17.06)	79.45*** (15.53)	78.91*** (17.09)
Finref2005	138.1*** (23.94)	142.2*** (31.79)	141.7*** (33.64)	131.7*** (33.81)	113.1*** (37.63)	131.7*** (30.73)
R-squared	0.74	0.72	0.69	0.71	0.66	0.71

Note: Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$; Control for initial conditions, *gdppccst2000* and the constant included in all the regressions; Excluded instruments: *coup_av*, *lat_abst* and *comlaw*.

Panel 1 uses Liquid liability and control of corruption, Panel 2 uses liquid liability and bureaucratic quality, Panel 3 uses private credit/GDP and control of corruption, Panel 4 uses private credit /GDP and bureaucratic quality. Similarly, Panel 5 uses deposits by the financial sector/GDP and control of corruption, while table Panel 6 uses deposits by the financial system/GDP and bureaucratic quality. Government ownership of banks in 2001 (*gbb2001*) as well as financial reform (*Finref*) are always positive and

significant at 1%. The level of significance of *Control of corruption* and *bureaucratic quality* varies, but they are always positive and significant either at 1%, 5% or 10%. The different econometric methods used are IV 2SLS, LIML, heteroscedasticity and autocorrelation robust standard errors GMM, iterative GMM and IVREG2².

Panel 2: Dependent variable is Liquid Liability, with bureaucratic quality measuring quality of institutions.

	OLS	TwoSLS	LIML	GMM_het	GMM_igmm	IVREG2
Bqlticrgav	2.477 (3.225)	10.88** (4.484)	12.54** (5.213)	10.39** (4.227)	12.16*** (4.225)	10.39** (4.248)
Gbb2001	59.38*** (14.02)	78.68*** (17.62)	82.94*** (19.01)	79.19*** (17.21)	79.72*** (15.82)	79.19*** (17.26)
Finref2005	138.5*** (23.69)	143.6*** (31.60)	143.3*** (33.49)	132.7*** (33.36)	115.6*** (37.04)	132.7*** (30.47)
R-squared	0.74	0.71	0.69	0.71	0.66	0.71

Panel 3: Using Private credit/GDP as dependent variable and control of corruption as a measure of institutional quality

	OLS	TwoSLS	LIML	GMM_het	GMM_igmm	IVREG2
Corricrgav	2.780 (4.441)	22.23* (11.85)	28.02* (16.69)	22.13** (10.69)	22.58** (10.63)	22.13** (10.99)
Gbb2001	35.00** (16.44)	67.83*** (23.27)	77.83*** (28.76)	64.68*** (22.09)	63.80*** (20.93)	64.68*** (22.92)
Finref2005	126.0*** (28.82)	137.2*** (32.88)	138.2*** (37.17)	138.4*** (34.71)	128.1*** (37.87)	138.4*** (32.81)
R-squared	0.78	0.72	0.66	0.72	0.70	0.72

Panel 4: Using Private credit/GDP as dependent variable and bureaucratic quality as a measure of institutional quality.

	OLS	TwoSLS	LIML	GMM_het	GMM_igmm	IVREG2
Bqlticrgav	2.473 (4.438)	22.12* (11.84)	27.49* (16.32)	21.26** (10.39)	21.59** (10.38)	21.26* (10.88)
Gbb2001	34.65* (16.69)	68.21*** (23.52)	77.62*** (28.70)	64.45*** (22.08)	63.33*** (21.13)	64.45*** (23.10)
Finref2005	126.2*** (28.92)	139.7*** (32.99)	141.3*** (37.15)	140.5*** (34.04)	132.0*** (36.79)	140.5*** (32.86)
R-squared	0.78	0.71	0.66	0.72	0.71	0.72

² Although the results that we present in this section are for 2009, we obtained similar or comparable results when we tested for other years i.e. 2004, 2005, 2006, 2007 and 2008.

Panel 5: Using deposits by financial system deposit/GDP as dependent variable and control of corruption as a measure of institutional quality.

	OLS	TwoSLS	LIML	GMM_het	GMM_igmm	IVREG2
Corricrgav	3.08 (2.799)	10.94*** (4.046)	12.82*** (4.938)	11.26*** (4.232)	12.37*** (4.248)	11.26*** (4.012)
Gbb2001	56.23*** (12.04)	72.64*** (12.88)	76.73*** (13.84)	72.82*** (12.22)	72.80*** (10.75)	72.82*** (11.82)
Finref2005	143.0*** (21.79)	137.0*** (28.23)	136.1*** (30.10)	133.3*** (30.97)	118.4*** (34.59)	133.3*** (27.65)
R-squared	0.80	0.74	0.72	0.739	0.70	0.73

Panel 6: Using financial system deposits /GDP as dependent variable and bureaucratic quality as a measure for institutional quality

	OLS	TwoSLS	LIML	GMM_het	GMM_igmm	IVREG2
Bqlticrgav	2.928 (2.776)	10.98*** (4.027)	12.81*** (4.901)	11.22*** (4.173)	12.25*** (4.205)	11.22*** (3.983)
Gbb2001	55.99*** (12.09)	72.87*** (12.96)	76.91*** (13.91)	73.46*** (12.40)	73.39*** (11.05)	73.46*** (11.95)
Finref2005	143.5*** (21.54)	138.5*** (28.08)	137.9*** (29.93)	134.5*** (30.58)	120.9*** (34.02)	134.5*** (27.45)
R-squared	0.80	0.74	0.71	0.73	0.70	0.73

Note: Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$; Control for initial conditions, *gdppccst2000* and the constant included in all the regressions; Excluded instruments: *coup_av*, *lat_abst* and *comlaw*.

Our results show that government ownership in 2001 is actually strongly associated with higher subsequent financial development. In line with the literature, our results also show that institutional quality is an important determinant of financial development. A similar positive relationship between government ownership of banks and growth has been found by previous studies such as Andrianova et al. (2009, 2012), Micco et al. (2007), Altunbas et al. (2001), Detragiache et al. (2005), Wen (2010), etc. However the main difference between them and our study stems from the fact that we consider the relationship between government ownership of banks and the subsequent soundness of the financial sector while they considered the relationship between government ownership of banks and economic growth.

Finally our study shows that financial reform is beneficial to the soundness of the financial sector. These findings may be surprising given the bulk of previous studies that showed that financial liberalization leads to financial crises. However, we suspect this is a result of the uniqueness of our liberalization index which takes into account all the aspects of financial liberalization as opposed to previous studies which used one or a few dimensions. However, previous studies (Shehzad and De Haan: 2008; Tressel and Detragiache: 2008 among others) have also found a positive relationship.

Conclusion

In this paper, we investigated the generally believed assumption that government ownership leads to subsequent unsoundness of banks. Firstly, we based our analysis on the LLS (2002) paper that was mainly

used as the basis by the Bretton wood institutions to recommend massive privatization of the banking sector by developing countries. We were able to show that their conclusions are fragile and only based on OLS regressions that suffer from omitted variable bias and as such cannot be trusted. Based on the literature that considers financial reforms and institutional quality as very important determinants of financial development, we introduced those two variables in the LLS regression and found that if there is any relationship between soundness of banks and government ownership, it is actually positive. Our proxy variable for institutional quality was control of corruption from LLS dataset but the trend of our results is maintained when we use other measures of institutional strength such as bureaucratic quality. Our results are also robust to various instrumental variable estimation methods including those used when instruments are weak. Similarly, our results are robust when we use loan availability as a measure of financial sector strength rather than using the soundness of banks indicator.

Finally, we used a recent dataset from 2001 to 2009 to test the same hypothesis that government ownership of banks leads to subsequent underdevelopment of the financial sector. We demonstrated that actually, during that period, higher government ownership of banks in 2001 was associated with higher levels of financial sector development in 2009. We also showed that greater control of corruption as well as strong financial reforms lead to greater financial sector development. This confirmed our findings in the first part of the paper.

Our results show that in an environment with stronger institutions, government ownership of banks leads to greater subsequent financial sector development as measured by soundness of banks, loan availability, private credit /GDP, liquid liability/GDP and deposits by the financial system/GDP. However, we are not advocating for massive nationalization of banks. Our argument is that government ownership is not always bad and should not be blamed for poor financial performances caused by poor institutions and lack of proper financial reforms.

These results have policy implication, especially now that some governments in developed countries have taken large shares in banks that were affected by the 2008 crisis. While at some point they will need to re-privatize them, our results mean that rather than being worried by the fact that now governments are controlling these banks, the most important focus should now be on how to strengthen institutions and regulatory authorities. Similarly, to developing countries, our results emphasize the supreme necessity to build strong institutions and make necessary financial reforms if they want to make real progress in advancing their economic development in general and their financial sector in particular. In our view, institutional quality and financial reforms matter more than ownership.

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