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Government Ownership of Banks, Institutions and Economic Growth *

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Abstract. We put forward a modern version of the 'developmental' view of government-owned banks which shows that the combination of information asymmetries and weak institutions creates scope for such banks to play a growth-promoting role. We present new cross-country evidence consistent with our theoretical predictions. Specifically, we show that during 1995–2007 government ownership of banks has been robustly associated with *higher* long run growth rates. Moreover, we show that previous results suggesting that government ownership of banks is associated with lower long run growth rates are not robust to conditioning on more 'fundamental' determinants of economic growth.

Keywords: Public banks, economic growth, quality of governance, regulation

JEL: O16, G18, G28, K42

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1 Introduction

In their attempt to prevent financial meltdown in the autumn of 2008, governments in many industrialised countries took large stakes in major commercial banks. While many countries in continental Europe, including Germany and France, have had a fair amount of experience with government owned banks, the UK and the US have found themselves in unfamiliar territory. It is, therefore, perhaps not surprising that there is deeply ingrained hostility in these countries towards the notion that governments can run banks effectively.[1] We show in this paper that such views are not well founded. Our empirical findings which utilise cross-country data for 1995–2007 suggest that, if anything, government ownership of banks has, on average, been associated with higher growth rates.

Hostility towards government owned banks reflects the hypothesis—known as the 'political view of government banks'—that these banks are established by politicians who use them to shore up their power by instructing them to lend to political supporters and government-owned enterprises. In return, politicians receive votes and other favours. This hypothesis also postulates that politically motivated banks make bad lending decisions, resulting in non-performing loans, financial fragility and slower growth. The political view of government banks was purportedly backed by empirical evidence in a paper by La Porta, Lopez-de-Silanes and Shleifer (2002)—henceforth LLS—which utilises cross-country regressions that uncover a negative association between government ownership of banks and average growth rates. LLS predict a 0.23 percentage point increase in the annual long run growth rate for every reduction in government ownership of banks by 10 percentage points, which is a very sizeable effect. These econometric findings have been used by the Bretton Woods institutions to back calls for privatising banks in developing countries (see, for example, World Bank (2001)).[2]

[1] See for example the article by Martin Wolf in the 16th October 2008 edition of The Financial Times which aptly summarises these views in its conclusion: "...Crisis-prone private banking is bad; government monopoly banking is still worse."

[2] World Bank (2001, p. 127) elaborates on the LLS results as follows: "...the fitted regression line suggests that had the share of government ownership in Bangladesh been at the sample mean (57 percent) throughout the period from 1970 instead of at 100 percent, annual average growth would have risen by about 1.4 percent, cumulating to a standard of living more than 50 percent higher than it is today."

Not all previous literature is unsympathetic to government ownership of banks. The 'developmental' view of government owned banks, which dates back to Gerschenkron (1962), emphasises the importance of governments in kick-starting financial and economic development. To this end, government ownership of banks can help address co-ordination problems that could prevent socially beneficial investments from being funded. More broadly, Acemoglu, Golosov and Tsyvinski (2008) show that government allocations can be more attractive than market allocations when there are effective controls on politicians or when self-enforcing risk-sharing arrangements in markets are not possible. In a similar vein, Andrianova, Demetriades and Shortland (2008) show that government owned banks may be more effective in mobilising saving than private banks when deposit contract enforcement in the private sector is weak. Moreover, a growing number of empirical studies suggest that public banks in various countries have played a positive role in the process of economic growth.[3]

Although the 'developmental' view may, at first sight, appear to apply to the early stages of economic development, we argue below that recent events make it relevant much more widely today. The failures in corporate governance and regulation, which became apparent after the global financial crisis of 2007–08, were present well before the crisis. Moreover, they are not too dissimilar to the institutional weaknesses found in the early stages of development, which provide scope for government banks to play a meaningful role.[4] Many analyses of the crisis (e.g. Igan, Mishra and Tressel (2009), Johnson (2009), Kane (2009) or Kane (2010)) suggest that banks in developed countries behaved opportunistically by adopting excessively risky strategies aiming more at maximising short term trading surpluses, implicitly or explicitly relying on government safety nets to cover downside risks. As a first step in our analysis, we explain how such strategies can undermine the growth promoting role of privately owned banks, building on the theoretical model of Andrianova et al. (2008).

[3]Specifically, bank-level studies suggest that in Germany and Russia public banks are more efficient than private banks (Altunbas, Evans and Molyneux 2001, Karas, Schoors and Weill 2008). There is also evidence from China, where government owned banks dominate the banking system, which suggests that banks there helped to promote economic growth, by boosting the productivity and value added growth of firms they financed (Demetriades, Du, Girma and Xu 2008, Rousseau and Xiao 2007).

[4]See, for example, Diaz-Alejandro (1985) for a classic analysis of the institutional weaknesses in Latin America that led to the failures of bank privatizations in the 1970's and 1980's. Zhang and Underhill (2003) provide a similar analysis of East Asian liberalisations that led to crises in the late 1990s.

The second step in our analysis, which is empirical in nature, is two-pronged. Firstly, we show that the LLS results, which pertain to an earlier period, are fragile to extending the set of conditioning variables to include more 'fundamental' determinants of economic growth such as institutional quality / quality of governance (Acemoglu, Johnson and Robinson 2005), which previous empirical literature has found to be significant (Knack and Keefer 1995, Hall and Jones 1999, Acemoglu, Johnson and Robinson 2001, Rodrik, Subramanian and Trebbi 2004, Demetriades and Law 2006). These new findings suggest that the support which the 'political' view of government banks has previously received from cross-country regressions is fragile.[5] We then proceed to the second—and main—empirical contribution of this paper, which is to show that government ownership of banks has been associated with higher average growth rates during 1995–2007. Because this is such a surprising finding, we provide numerous robustness checks, including an extensive search for omitted variable bias using Extreme Bounds Analysis (EBA) and possible endogeneity bias using two alternative sets of instruments. We show that our main finding is robust, suggesting that the 'developmental' view of government owned banks remains relevant today.

The paper is structured as follows. Section 2 puts forward our theoretical contribution, which can be considered as a modern version of the developmental view of government banks. Section 3 summarises the two data sets we utilise and their sources. Section 4 contains our empirical contribution, which provides robust evidence of a positive association between government ownership of banks and economic growth. Section 5 summarises and offers some ideas for further research.

2 A modern version of the 'developmental' view of government banks

The traditional 'developmental' view of government-owned banks emphasises co-ordination failures and 'big-push' phenomena, which can create scope for government owned banks to play a growth-enhancing role. This view, however, predates the economics of information literature,

[5]We hasten to add that this does not necessarily invalidate case studies which provide support to this view (World Bank 2001), although one must also acknowledge case studies which provide support to the developmental view.

which can provide an additional rationale for government-owned banks, particularly when the institutions that are aimed at containing moral hazard in private banking are weak.

In what follows, we put forward a new version of the 'developmental' view of government-owned banks, drawing on the implications of imperfect information for bank behaviour and (the reality of) varying effectiveness of financial regulation. Specifically, we extend the model of government-owned banks in Andrianova et al (2008) in a direction that allows us to explore the effects of opportunistic behaviour by banks on growth-promoting investment.

The informational problem that we focus on is the inability of depositors to observe the risks taken by banks.[6] When deposit contract enforcement is weak, banks can take excessive risks with depositors' money; at the extreme they could engage in looting behaviour. This is precisely the set-up in Andrianova et al. (2008), which analyses the problems faced by depositors when deposit contract enforcement is weak and some banks behave opportunistically. Andrianova et al. (2008) assume that opportunistic banks will appropriate depositors' money if they obtain a higher expected payoff from doing so. Because that paper focuses on the implications of such behaviour for savings mobilisation, the investment side of the model is a very simple one. Specifically, there is no difference between an honest bank and an opportunistic bank when it comes to their investments. Thus, Andrianova et al. (2008) is silent on the implications of banks' behaving opportunistically for economic growth (other than any indirect effects through financial development).

Here we model opportunistic behaviour by banks in a more natural way, by ruling out outright appropriation of depositors' money and instead allowing opportunistic banks to engage in speculation. Specifically, the opportunistic bank chooses between a 'sound' investment available to all banks and a speculative one that has a much higher payoff in the good state but fails completely in the bad state. In this setting, depositors can still lose all their money although we now introduce deposit insurance that compensates them with probability less than one. There can, therefore, be a divergence between the (expected) private and social returns of the speculative investment, as a result of which this investment can, in general, be considered growth-reducing. These assumptions accord well with many of the stylised facts surrounding the recent financial crisis, such

[6]There are of course many other informational failures in banking that can provide a rationale for other forms of government intervention including financial regulation, deposit insurance, lender of last resort services and even deposit rate ceilings. See, for example, Goodhart (1995), Goodhart (1988), Stiglitz (1993) or Hellmann, Murdock and Stiglitz (2000).

as the compounding of agency problems by complex financial products, lack of transparency and unreliable risk assessments by rating agencies. The assumption that some banks can engage in speculative investments that can enrich bankers in the good state but would impose a burden on the rest of society in the bad state is plausible. The anatomy of the recent crisis suggests that some investments by banks were opaque and complex by design, in order to effectively deceive investors who lacked the information and skills to evaluate them. It is, therefore, not unreasonable to postulate that such uncontained moral hazard will be growth-reducing. Besides the gross expected social return being low or even negative once the costs in the bad state of the world are taken into account, there is the additional cost that moral hazard induced financial innovation requires talented individuals to implement it; in itself this represents an additional important distortion that is likely to reduce long run growth rates.[7]

We introduce a risky investment as a reason for deposit contract breach in the theoretical setting of Andrianova et al. (2008) which in itself is an extended version of the "circular city" model of product differentiation in banking.[8] As in Andrianova et al. (2008), we have private banks and a continuum of risk-neutral depositors located along a circle of unitary length. Depositors are uniformly distributed with unitary distribution density. A depositor incurs a positive transportation cost α which is proportional to the distance between the depositor and the bank. In the centre of the circle, a single government-owned and operated bank is assumed to have been in existence for some time, and as a result has equal appeal to all depositors.[9]

The depositors are endowed with 1 unit of cash but do not have direct access to this technology: they could choose to put their cash holdings in a bank in order to earn a return. The money collected from private depositors can be invested into a safe technology with a constant rate

[7]See, for example, Hakenes and Schnabel (2006) for a similar argument. Recent evidence utilising data from 44 countries during 1973–2005 in fact shows that wages in the financial sector relative to the technology sector had a negative and strongly significant impact on technological innovation measured by the stock of patents (Ang 2010), providing empirical support for our conjecture. See also Acemoglu (1995) for a theoretical exposition of the possibility that society may get trapped in a rent-seeking steady state equilibrium in which talent is misallocated.

[8]The "circular city" was originally developed by Salop (1979) and later applied to banking (Freixas and Rochet 1997) as an analytically convenient way to model deposit contracts competition among banks which differ only in their fixed setup cost.

[9]This implies, in particular, a zero fixed cost of the goverment bank.

of return r. All banks, private and government-owned, have access to this "sound banking" technology. A proportion $\gamma \in (0,\ 1)$ of private banks have, in addition, access to a risky technology which returns R with probability $\rho \in (0,\ 1)$ or zero with probability $1-\rho$. We call these private banks "opportunistic" to distinguish them from the banks that do not have access to the gambling technology (the latter are called "honest"): an opportunistic bank choses whether to invest safely or to gamble with depositors' money. The type of private bank is its private information, while the value of γ is common knowledge. Because of the riskiness of the gambling technology, an opportunistic bank fails to honour its deposit contract whenever the return on the investment is zero. We think of this investment as speculative and socially unproductive. As such, it is outlawed by the regulator: a private bank that chose to gamble is found out with probability λ and if additionally the positive return from gambling is realised, the bank is fined by the amount $f > 0$ per depositor contract. Investments in the risky technology that return zero are sunk and in such case, depositors lose their deposit but with probability $\lambda \in (0,\ 1)$ are compensated by the amount $0 < d \leq 1$ through a deposit insurance scheme.[10]

The government bank offers a net deposit rate of $r_s = r_s^0 - \alpha/(2\pi) > 0$ to all depositors. Private banks are located anywhere along the circle with bank i offering deposit rate r_i $(i = 1, \ldots, n)$ which is set up so as to maximise profits. There are potentially many identical private banks that can enter the industry at a positive fixed cost, F, and with free entry n banks will enter.

The timing of events is as follows.

(1) Private banks decide whether to enter; n banks enter.

(2) Private bank i $(i = 1, \ldots, n)$ sets its deposit rate r_i.

(3) Each depositor chooses the bank in which to place the deposit of 1 monetary unit.

(4) Opportunistic banks choose whether to invest in a safe or risky technology.

(5) Risky investments are discovered with probability λ.

(6) Returns on investments are realized. Payoffs are realized.

[10]The depositor compensation probability does not have to be the same as the bank punishment probability. Nevertheless, as the two measure different aspects of government effectiveness, they are likely to be highly correlated and in the model we treat both as λ for expositional convenience.

The model is solved by backward induction. Firstly, for a given strategy of opportunistic banks (namely, safe or risky investment), depositors choose which bank (private or government owned) to deposit their money. Secondly, given the realised deposit demand, each bank sets the deposit rate at the level which maximizes its profits. Finally, for a given level of demand and profit maximizing deposit rate, each private bank decides whether to enter.

Let $\kappa \in \{0, 1\}$ represent an opportunistic bank's decision to invest into the safe technology ($\kappa = 0$) or invest in the risky technology ($\kappa = 1$). The expected payoffs of the depositor located at distance x_i from a private bank i and depositing his money in bank i is

$$U_i^{pb}(\kappa) = [1 - \gamma\kappa(1-\rho)] \cdot (1 + r_i) + \gamma\kappa(1-\rho)\lambda d - \alpha x_i, \tag{1}$$

where κ is set by the bank to maximize its profits. If the depositor, instead, puts his money into the government bank, then his payoff is

$$U^{sb} = 1 + r_s \tag{2}$$

because every depositor is one radius away from the state bank and $r_s = r_s^0 - \alpha/(2\pi)$. The expected payoffs of an honest bank and an opportunistic bank are, respectively:

$$V^{1-\gamma} = (r - r_i) \cdot D_i, \tag{3}$$

$$V^{\gamma}(\kappa, \lambda, d) = (1-\kappa)(r - r_i) \cdot D_i + \kappa\rho \cdot [R - r_i - \lambda f] \cdot D_i. \tag{4}$$

The government bank's expected payoff is $V^s = (r - r_s^0) \cdot D_s$. There is an assumed bias against the government owned bank:

Assumption 1 $$r_s \leq r - 3/2 \cdot \sqrt{\alpha F} \tag{A1}$$

(A1) states that in the absence of speculative investments, private banking is more efficient than government banking.

Assumption 2 $$\alpha F > 1 \text{ and } f \geq R - r \tag{A2}$$

(A2) states that the costs borne by private banks and depositors (set up and transportation) are higher than an individual deposit, and also that the punishment on a bank found by the regulator to have invested in the risky technology is higher than the excess return from the risky technology. The assumption is a technical one and makes the model set up interesting.

Three types of (pure strategy) equilibria are possible in this model. "High" equilibrium (HE) where there is no demand for the government bank and no speculative investment by the private banks; "intermediate" equilibrium (IE) with both the government and private banks having positive demand for deposit contracts, and "low" equilibrium (LE) where there is positive demand only for the government bank and no private bank enters. For expositional convenience, define the following bounds:

$$\lambda_g \equiv \frac{\rho(R-r)-(1-\rho)\sqrt{\alpha F}}{\rho f}, \tag{5}$$

$$\lambda_x \equiv \frac{\gamma(1-\rho)(1+r)-(r-r_s)}{d(1-\rho)} \tag{6}$$

$$\tilde{n} \equiv \frac{1}{2F}\Big(r-\frac{(1-\rho)(1-\lambda d)\gamma r_s}{1-\gamma(1-\rho)}\Big) \tag{7}$$

Proposition 1 *Assume (A1) and (A2). A unique (pure strategy) equilibrium exists and it is of type:*

(i) HE, if $\lambda \geq \lambda_g$. *Then* $r_i = r - \sqrt{\alpha F}$, $D_i = \sqrt{F/\alpha}$, *and* $n = \sqrt{\alpha/F}$ $(i = 1, \ldots, n)$;

(ii) IE, if $\lambda_x \leq \lambda < \lambda_g$. *Then* $r_i = \frac{1}{2}[r + \frac{r_s+\gamma(1-\rho)(1-\lambda d)}{2(1-\gamma(1-\rho))}]$, $D_i = [r - r_s - \gamma(1-\rho)(1+r-\lambda d)]/\alpha$ *and* $n < \tilde{n}$ $(i = 1, \ldots, n)$;

(iii) LE, if $\lambda < \min\{\lambda_x, \lambda_g\}$. *Then* $D_i = 0$ $(i = 1, \ldots, n)$, *and* $n = 0$.

Remark 1 *The depositors' demand for private banking is greater when the institutional quality is higher and the proportion of opportunistic banks is lower.*

This is easily verified by noting that in IE the demand for a private bank i, D_i, is an increasing function of λ and a decreasing function of γ.

Remark 2 *When private and government banking co-exist, the productivity of capital is increasing with institutional quality, decreasing with the proportion of opportunistic banks and (consequently) increasing with the share of deposits in the government bank.*

This immediately follows from the observation that in IE, the only equilibrium in which there is positive demand for both private and government deposit contracts, the productivity of capital is inversely related to the total capital invested in the speculative activity. The latter happens to be $\gamma \cdot n(\gamma, \lambda) \cdot D_i(\gamma, \lambda)$, and it is rising with λ and falling with γ.

3 Data and Sources

For the first set of regressions aimed at examining the robustness of the LLS results we use the original database from LLS. We first reproduce results from Table V and Table VI in LLS; we then add two additional conditioning variables from the LLS database, which capture "institutional quality": the index measuring bureaucratic quality and its insulation from political intervention (`bqualitt`) and the index of property rights (`prop_hf9`), which measures how well private property rights are protected.

For the new results we utilise annual GDP growth, GDP *per capita* and inflation rates from the World Economic Outlook database. Annual GDP *per capita* growth (in 2005 US$) is from the ERS. Data on institutional quality are from the Kaufmann, Kraay and Mastruzzi (2005) Quality of Governance dataset. We create the average value of each institutional quality variable from all the available databases spanning 1998–2005.[11] Both transition economies and many oil exporting countries have seen above average growth during the period. We therefore include two dummy variables in the regressions. The first is a "transition dummy" for all former members of the Warsaw Pact and the former Soviet republics.[12] The second is a dummy for all net oil exporters: we use the Fearon (2005) pirmary commodity export measure and construct a dummy for all countries were on average oil exports exceed 20% of exports. This is to control for countries which have grown fast after their transitional recessions or on the basis of oil exploitation over the period, regardless of economic instability, institutional quality or regulatory structures.

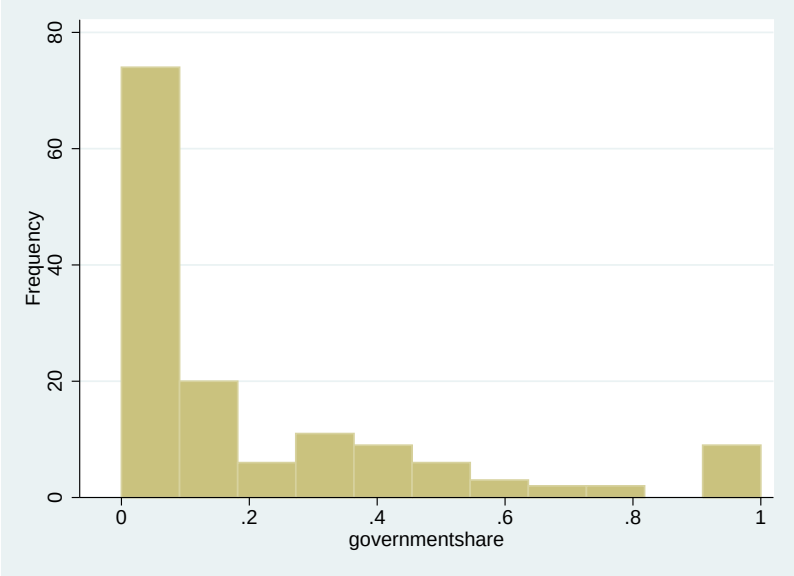
The government ownership of banks variables are from the various World Bank datasets on banking regulation and financial structure (Caprio, Levine and Barth (2008)—henceforth, CLB). We supplement the CLB dataset with Cambodia, China, Vietnam, Myanmar, Iran, Iraq and Yemen. These countries did not respond to the World Bank questionnaire on government ownership, but we assume due to the political situation that 100% of banks in these countries take political orders. These variables measure the "percentage of (the) banking system's assets in

[11] The table of pair-wise correlations in the Data Appendix shows a correlation of average regulatory quality and government ownership of banks of -0.325. As in our previous paper, better regulatory quality is associated with a lower share of government owned banks.

[12] The table of pair-wise correlations in the Data Appendix shows that transition has been strongly associated with a strong growth performance in the period 1995–2007.

banks that are 50% or more owned by government". The data are available for 1999, 2001 and 2005. We also include the LLS variable for government ownership of banks in 1995 (with government ownership at 50% for compatibility) for robustness checks. Correlation between the CLB 2001 and 2005 variables is high (.866) and the correlation between the CLB 1999 and 2001 observations slightly lower (0.721). The correlation between the LLS 1995 variable and the CLB 2001 and 2005 variable is 0.654 and 0.572 respectively. Data availability is best in the 2001 dataset with 134 observations, compared to 110 in 2005, 103 in 1999 and 92 in the LLS dataset. Figure 1 shows the distribution of the 2001 CLB government ownership variable. Even after a decade of determined privatisation under the "Washington consensus" a number of countries have preserved often significant shares of government ownership of banks.

FIGURE 1: *Government Ownership of Banks, 2001*



The LLS regressions include a variable for the average years of secondary schooling in the labour force. We collect data on educational attainment from the World Development Report, which records the percentage of the labour force with at least secondary education. We use the first available entry for secondary and tertiary education between 1995 and 2007 to maximise data availability. The series is highly correlated with the Barro and Lee (2000) dataset on the average number of years of schooling. For both variables the number of observations for the final regression specification is low (80 observations or below) and there are no statistically significant effects for

the education variable. The results reported below therefore mostly exclude this variable.

More details on the variables we utilise and their sources, as well as summary statistics and the list of countries on which the reported results are based are provided in the Data Appendix.

4 Empirical Analysis

4.1 Fragility of LLS results

Table 1 demonstrates the fragility of the LLS results when (their own) institutional controls are introduced in the equations. The first and second columns are the original LLS regressions (from LLS Table V and Table VI respectively) that we replicated and are reporting for comparison purposes. Columns 3 and 4 introduce bureaucratic quality and the index of property rights simultaneously in the equations, both of which enter with positive coefficients and are significant at the 5% level. The consequence of this is that the government ownership variable loses significance. In the third column—which contains few other controls—its sign remains negative but the magnitude of its coefficient declines by more than three quarters. Specifically, it decreases from just under 2.0 percentage points to under half a percentage point. In the fourth column which contains additional controls the LLS coefficient changes sign i.e. it is now positive. It is also noteworthy, that the introduction of the institutional variables increases the adjusted R-square of the regressions from 0.34 to 0.54 in the first instance and from 0.50 to 0.64 in the second instance. Besides the results reported in Table 1, we have ran numerous other models that are not reported here for brevity but which confirm the fragility of the LLS results. These include running the regression with one institutional quality indicator at a time and using alternative institutional variables.[13]

To summarise, government ownership of banking in LLS had a negative and almost always statistically significant coefficient in the published model specifications. However, the LLS models excluded institutional quality indicators which are widely considered the more fundamental determinants of long run growth. As argued in Andrianova et al. (2008), government ownership of banks is a symptom of weak institutions. If institutional quality is omitted from growth regres-

[13]Some of these can be found in the discussion paper version of our paper (Andrianova, Demetriades and Shortland 2009).

sions, government ownership acts as a proxy for the missing fundamental variable. This explains the LLS results. Once, however, institutional quality indicators are added alongside government ownership of banking, government ownership of banks is no longer significant and the main LLS finding evaporates. "Governance" matters, while bank ownership does not. The widely publicised negative effect of government ownership of banks was clearly the result of omitted variable bias, rather than the true effect of government owned banks on the long-run average growth rate.

4.2 Government Ownership of Banks and Economic Growth: 1995–2007

Table 2 presents the estimation results of the baseline model with different samples of countries. The first column provides the estimates using the entire data set of 128 countries. The coefficient on government ownership is positive and significant at the 1% level. Its magnitude of 0.036 size is quite large, suggesting that countries with 50% government ownership grew by 1.8% per annum higher than countries without government owned banks, all other things equal. Moreover, the remaining coefficients have the expected signs and are statistically significant. The second column excludes seven countries with 100% government ownership of banks (China, Vietnam, Cambodia, Myanmar, Iran, Iraq, Yemen) to check whether the main result is driven by these countries. While the coefficient on government ownership declines to 0.029, it remains sizeable and highly significant, suggesting that a 50% government share in the banking system resulted in nearly 1.5% higher growth p.a. The third column excludes countries with population less than 4 million, which results in a reduction in the number of countries to 92. Nonethelss, the coefficient of interest, if anything rises slightly compared to the first column, suggesting that small countries are not driving the results.

Column 4 restricts the sample to the LLS countries in order to examine whether the difference between our results and the LLS ones is due to the addition of 'new' countries in the later period. Once again the coefficient of interest remains positive and significant at the 1% level. If anything, it rises slightly compared to the baseline sample. Column 5 utilises the LLS measure of government ownership of banks (which is not available for the larger group of countries). This time the coefficient of interest declines to about half its size but remains positive and highly significant. Even with this smaller coefficient, the effect of a 50% government share is economically large: it is associated with a nearly 0.9% higher growth rate during the sample period.

Table 3 reports regression results with additional control variables as a first check for possible omitted variable bias. These variables include an oil dummy, inflation, banking concentration, FDI and bank privatisation, added one at a time. Of these additional control variables, only two appear significant: FDI and the oil dummy, although the latter is significant only at the 10% level. Notwithstanding the significance or not of these additional controls, the coefficient on government ownership remains positive and significant throughout. Its estimated coefficient is rather large suggesting that 50% government ownership of banks is associated with 1.6–1.9 higher growth p.a.

4.3 Extreme Bounds Analysis

Additional robustness checks are reported in Table 4, which summarises the results of an Extreme Bounds Analysis (EBA), designed to check whether the main result is robust to the inclusion of all possible linear combinations of an additional group of conditioning variables.[14] The baseline regression includes the variable of interest and a group of 'focus' variables which in our case include initial GDP per capita, regulatory quality and a transition dummy. Initial GDP per capita is an uncontroversial variable to include in the focus group as it is intended to capture convergence. The inclusion of the transition dummy in the focus group is intended to avoid potential upward bias of the coefficient of the variable of interest. Most transition countries experienced fast growth during the period under investigation while their banking systems remained at least partially under government control; not including a transition dummy could bias the coefficient of interest upwards as government ownership of banks may then to some extent act as a proxy for transition. Including regulatory quality in the focus group can be rationalised by alluding to the literature that emphasises institutions as a fundamental determinant of economic growth, and is consistent with the uniformly highly significant coefficients found for institutional quality in Tables 1, 2 and 3. The group of 'doubtful' variables that we include in our EBA comprises (i) the average inflation rate; (ii) trade openness, defined as the ratio of exports plus imports to GDP; (iii) liquid liabilities as a ratio of GDP; (iv) Foreign Direct Investment as a ratio of GDP; (v) banking concentration; (vi) small country dummy and (vii) oil exporter dummy. Thus, the results presented in Table 4 are the summary outcome of running 256 regressions in the EBA (our fixed set and 7 additional

[14] Extreme bounds analysis has its origins in the pioneering work of Leamer (1983) and has been applied extensively in the growth literature. See for example, Bougheas, Demetriades and Mamuneas (2000).

variables). The extreme bounds reported in Table 4 are the upper and lower bounds of the estimated coefficient of the variable of interest, plus or minus two standard errors, respectively. As can be seen, the range between the lower and upper bounds does not include zero, which suggests that the main result is robust.

4.4 Instrumental Variable Estimation

Considerable caution needs to be exercised when deriving policy implications from findings obtained from cross-country regressions. The implicit assumption that is frequently made when interpreting such results is that the long run relationship between the variables of interest is homogeneous across countries. This need not be the case if, for example, countries have differential access to technology. If the relationship is heterogeneous across countries, the average relationship estimated from cross-country regressions cannot be used to carry out policy experiments such as "What is the effect on country X's long run growth if country X's share of government ownership increased by Z%?" Even if the long run relationship is homogenous across countries, it does not necessarily follow that the direction of causality is the same across countries.[15] Hence, while government ownership of banks appears to have been associated with higher long run growth in a cross-country setting during 1995–2007, our results should not be taken to imply that increasing the degree of government ownership in countries with little or no government ownership will result in higher long run growth rates. Although reverse causality would be hard to rationalise in this particular case—there is no obvious reason why high growth rates should result in greater government ownership of banking—the relationship, if homogeneous across countries, could reflect common unobserved driving factors. Likely unobservable factors that may result in greater government ownership of banks and have an impact on GDP growth include various forms of financial market failures. If such failures abound and if, also, institutions designed to contain them are weak, governments may choose to nationalise banks. Such failures would of course correlate negatively with GDP growth, so arguably the coefficients of government ownership of banks on

[15]For example, although cross country regressions show that finance and growth are positively correlated, it does not follow that finance leads growth in all countries; indeed time-series evidence suggests that causality between finance and growth varies across countries. See, for example, Demetriades and Hussein (1996) and Arestis and Demetriades (1997).

growth in OLS regressions may display downward bias.[16]

The above analysis suggests that an important final check of robustness of our results would be to isolate the effect of the 'exogenous' component of government ownership of banks on economic growth in so far as this is feasible. To this end, Table 5 reports results from Instrumental Variable regressions designed to shed further light on this issue. We utilise two alternative instrument sets for government ownership of banks. This is partly because our preferred instrument set results in a much smaller group of countries due to data availability. The second set of instruments enables us to estimate the model on the entire data set, although the trade off is a less than ideal instrument set.

Our preferred instrument for government ownership of banks is the black market premium which is, by definition, a good indicator of the extent of market failure and/or institutional weakness. This variable correlates well with government ownership of banks and much less so with economic growth, making it an ideal instrument for government ownership.[17] As an additional instrument we also use bank failures at the beginning of the estimation period, which provide another form of evidence on financial market failure which frequently necessitates takeovers of banks by government. In the regressions in which regulatory quality is treated as endogenous, we additionally utilise latitude and regional dummies as additional instruments. The first instrument is in line with a large literature searching instruments for institutional quality which emphasises the disease environment encountered by settlers from colonising powers as one of the primary determinants that shaped the nature of a countrys institutions (Acemoglu et al. 2005). In similar vein, regional dummies can proxy different cultural attitudes towards institutions that govern economic interactions such as, for example, property rights or economic and financial regulation.

The downside of using the aforementioned instruments is that the sample is reduced to 58 countries, because the black market premium is missing for many countries. For this reason, in order to check robustness further, we also utilise legal origin dummies as an alternative set of instruments for government ownership of banks. These variables, which are available for the entire

[16]See, for example, Rodrik (2005) who has argued that we can learn nothing from regressing economic growth on policies largely because the latter may reflect an optimal government response to market failure that is negatively correlated to growth.

[17]The correlation coefficient between the black market premium and government ownership of banks is 0.48; the same variable has a correlation coefficient with GDP per capita growth of 0.17.

data set, are plausible instruments for government ownership of banks since legal origin is widely believed to be a good predictor of financial structure.[18] Countries of Anglo-Saxon legal origin are less likely to have government owned banks than countries of French legal origin. Similarly, countries with socialist legal origin are more likely to have retained some government owned banks than others, for historical reasons. However, pair-wise correlations between legal origin dummies and government ownership of banks show that these variables are less strongly correlated with government ownership than the black market premium. Moreover, they are not uncorrelated with GDP growth, which suggests that they may be weaker instruments than the black market premium.

The results of fitting the baseline model to the data using the first set of instruments are presented in the first and second columns of Table 5. The third and fourth columns show the results using the instrument set that contains the legal origin dummies. The table reports a test of the over-identifying restrictions—a significant test statistic indicates that the instruments may not be valid. The table also reports a test of weak instruments, which is, however, available only when the model contains one endogenous regressor. We also report some first-stage goodness of fit statistics to shed light on instrument strength. In the cases of more than one endogenous regressor (columns 2 and 4), we report Shea's partial R-squared.

Starting with column 1 in Table 5, it can be noted the coefficient of interest remains positive and highly significant. If anything, it is slightly higher than in the corresponding OLS estimate. This is, of course, not very surprising because, as explained above, endogeneity is more likely to bias the coefficient on government ownership downwards. Regulatory quality remains significant at the 5% level, while initial income remains negative but is significant at only the 10% level. The estimated coefficients of both these variables are very similar to those obtained with OLS. Importantly, the over-identifying restrictions cannot be rejected, suggesting that the instruments are not invalid. Moreover, the hypothesis of weak instruments is strongly rejected. The results in column 2, in which regulatory quality is also treated as an endogenous variable, are very similar to those reported in column 1. Both the endogenous variables remain positive and are significant at the 5% level. Although their coefficients change somewhat, the estimates are not too dissimilar

[18]There is, however, some recent literature by legal scholars that questions widely held views in economics about the relationship between legal origins and financial market structure (Armour, Deakin, Lele and Siems 2009), which is the main reason we are slightly sceptical of its ability to predict financial structure.

from those obtained with OLS. Moreover, the over-identifying restrictions cannot be rejected at the 5% level and the diagnostics from both the first stage regressions indicate that the instruments are not weak.

In the third column, in which government ownership is instrumented with legal origin dummies, the coefficient of interest remains positive and significant; its magnitude is about 1.0 percentage point higher than the corresponding OLS estimates. The remaining variables remain significant and have the expected signs. Moreover, the over-identifying restrictions cannot be rejected suggesting that the instruments are valid, while the hypothesis of weak instruments can once again be rejected. Finally, the results in column 4, in which regulatory quality is also treated as an endogenous variable, reveal that both the endogenous regressors retain their positive coefficients and are now sigtnificant at the 1% level. The coefficient of government ownership is somewhat higher than the one obtained with OLS while the coefficient on regulatory quality doubles compared to the corresponding OLS estimate. The remaining coefficients have the expected signs and are statistically significant. Furthermore, the over-identifying restrictions cannot be rejected and the diagnostic statistics do not indicate that the instruments are weak.

4.5 The Trade-off between Regulation and Government Ownership

If government ownership of banks is indeed an answer to weak regulation, its positive effects on growth may well diminish as the quality of regulation improves. We test this corollary of our analysis by introducing an interaction term between regulatory quality and government ownership of banks in the baseline regression.

The results, which are obtained using both OLS and IV estimation, are reported in Table 6 Panel A. We also report the corresponding estimates of the baseline model without the interaction term for comparison purposes. The OLS estimates suggest that the interaction term is negative and highly significant. The level terms remain positive and significant, although with slightly changed coefficients. Government ownership has a slightly smaller coefficient of 0.0287 compared to 0.0359 in the baseline model, while regulatory quality has a slightly higher coefficient of 0.0153 compared to 0.0112 in the baseline. These results suggest that at the world average of regulatory quality (which is standardised at 0), a 50% government ownership of banks is associated with 1.4 percentage points of higher growth per year.

Panel B in Table 6 uses the OLS estimates to report the partial derivatives of growth with respect to government ownership of banks at different levels of regulatory quality. These derivatives decrease in regulatory quality. At the 10^{th} percentile of regulatory quality the derivative is 0.0448 and is significant at the 1% level. It declines to 0.0371 at the 25^{th} percentile and then to 0.0309 at the median level, remaining significant at the 1% level. At the 75^{th} percentile, the derivative declines to 0.0189 and is significant at the 5% level. At the 90^{th} percentile of regulatory quality it declines to 0.01 and is no longer significant. These results, therefore, suggest that government ownership of banks has its greatest impact in countries with weak regulation. They also indicate that even in countries with above average regulation, government ownership of banks is associated with higher growth. It ceases to have an impact on growth when regulation reaches one standard deviation above the mean.

However, these conclusions must be treated with some caution because the IV estimates reported in panel A indicate that the interaction term is not significant. These estimates have, however, been obtained treating not only government ownership as endogenous but also regulatory quality and the interaction term. To obtain these estimates we used the legal origin instruments and regional dummies and latitude set to start with, adding interactions between the legal origins and latitude to instrument the interaction term. The results are not sensitive to adding additional interaction terms to the instrument set. They do nevertheless continue to provide strong support to the hypothesis that government ownership of banks and regulatory quality are drivers of economic growth during 1995–2007, since both these variables enter with positive and highly significant coefficients. We cannot therefore be confident that the positive association between government-owned banks and growth weakens with better regulation.

4.6 Summary

To sum up, the evidence we have presented in this section suggests that government ownership of banks during 1995–2007 has been robustly associated with higher economic growth. Extreme Bounds Analysis shows that this finding does not appear to be the result of omitting other potentially important determinants of growth, such as openness, inflation, overall financial development or FDI. Moreover, we have shown that it is not the result of omitting bank privatisation from

the regressions.[19] IV estimations show that the main result does not reflect reverse causality or common driving factors, although the latter, if important, would likely have biased the relevant OLS coefficient downwards. Finally, we have explored the possibility that the effect of government ownership on growth declines with the degree of regulation. We have found strong support to this hypothesis from OLS regressions, which suggest that the effect is very sizeable in weak regulatory environments but becomes insignificant when regulation reaches the top 10% international standard. If true, this result suggests that government owned banks could be an effective substitute for good regulation.

5 Concluding Remarks

Our empirical findings suggest that government ownership of banks has, if anything, been associated with faster long run growth. Specifically, we have found 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. It is therefore clear that, on balance, government ownership of banks, where it prevailed, has not been harmful to economic growth.[20] This is, of course, a surprising result, especially in light of the widespread belief—typically supported by anecdotal evidence—that "...bureaucrats are generally bad bankers" (see, for example, World Bank (2001, p. 127)). Our results certainly suggest that such anecdotal evidence cannot and should not be generalised. Indeed, a growing body of evidence suggests that publically owned banks are no less efficient than privately owned banks and have helped to promote economic growth (Altunbas et al. 2001, Karas et al. 2008, Demetriades et al. 2008, Rousseau and Xiao 2007).[21]

[19] In the discussion paper version of the paper we show that privatisation has a positive effect only when the transition dummy is omitted when it acts as a rather crude proxy for transition.

[20] In the sense that, all other things equal, these countries did not have lower growth rates than countries without government owned banks. It can, of course, be argued that countries with government owned banks and high growth rates, like China, India and Taiwan, could have grown even faster if they had privatised their banking systems. This is of course something that cannot be tested directly, although the evidence presented in this paper and elsewhere (Demetriades et al. 2008, Rousseau and Xiao 2007) does not provide much support to this view.

[21] See also Ang (2010) who finds that financial liberalisation measures that include bank privatisation have a negative and significant effect on technological innovation.

There are a number of avenues for future research emanating from this paper. It could be fruitful to re-examine the political view of government owned banks in light of our results. Our conjecture is that the view can be turned on its head because corrupt politicians in democracies might find it easier to extract rents from poorly regulated private banks than from government owned ones. New empirical research could be fruitful if longitudinal data on government ownership of banks could be made available. Such data would allow exploiting the time dimension to arrive at more precise estimates of the parameters of interest and could provide the basis for more in-depth policy analysis.

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Table 1: Robustness Checks of LLS

Ordinary least squares regressions of the cross section of countries
The dependent variable is the average annual growth rate of per capita GDP, 1960–95

	LLS Table V "Simple Growth Regressions"	**LLS Table VI "Growth Results with Different Combinations of Controls"**	**LLS Models with Institutional Variables**	
	Ia	**IIa**	**Ib**	**IIb**
GB70 [gbbp_70]	-0.0199***	-0.0152*	-0.0045	0.0012
	(0.0071)	(0.0091)	(0.0064)	(0.0083)
Log of initial GDP per capita [logy60f]	-0.0160***	0.0157***	-0.0211***	-0.0204***
	(0.0033)	(0.0042)	(0.0028)	(0.0037)
Average years of schooling [ysch_av]	0.0061***	0.0044**	0.0028***	0.0021
	(0.0013)	(0.0018)	(0.0011)	(0.0018)
High inflation dummy [infl_d20]		0.0073		-0.0093
		(0.0070)		(0.0060)
Latitude [lat_abst]		0.0039		-0.0004
		(0.0184)		(0.0157)
Private credit / GDP in 1960 [prif_i60]		0.0217**		0.01467*
		(0.0102)		(0.0088)
Bureaucratic quality [bqualitt]	omitted	omitted	0.0040***	0.0043***
			(0.0010)	(0.0011)
Property rights [prop_hf9]	omitted	omitted	0.0081***	0.0066**
			(0.0029)	(0.0031)
Intercept	0.0911***	0.1019***	0.0764***	0.0808***
	(0.0171)	(0.0212)	(0.0137)	(0.0176)
Regional dummies	No	Yes	No	Yes
R^2	0.3403	0.5012	0.5416	0.6390
Observations	85	82	83	80

Notes:
All variables are defined in La Porta et al. (2002) and taken from La Porta et al database available at http://mba.tuck.dartmouth.edu/pages/faculty/rafael.laporta/publications.html.
* denotes significance at the 10% level; ** denotes significance at the 5% level; *** denotes significance at the 1% level.
Figures in parentheses are robust standard errors.

Table 2: Baseline Model with Different Samples

Ordinary least squares regressions of the cross section of countries
The dependent variable is the average annual growth rate of per capita GDP, 1995–2007

	Model III	**Model IV**	**Model V**	**Model VI**	**Model VII**
Sample	Baseline Sample	Excluding 100% government ownership	LLS countries	LLS countries	Excluding small countries
Government owned banks in 2001	0.0359***	0.0289***		0.0365***	0.0370***
	(0.0072)	(0.0089)		(0.0093)	(0.0080)
Government owned banks in 1995 (LLS)			0.0172***		
			(0.0065)		
Log of initial per capita GDP	-0.0046***	-0.0041***	-0.0036*	-0.0044**	-0.0020
	(0.0015)	(0.0018)	(0.0020)	(0.0018)	(0.0015)
Regulatory quality	0.0112***	0.0103***	0.0089***	0.0136***	0.0071**
	(0.0025)	(0.0030)	(0.0029)	(0.0029)	(0.0030)
Transition	0.0324***	0.0332***	0.0169***	0.0234***	0.0271***
	(0.0063)	(0.0064)	(0.0043)	(0.0044)	(0.0059)
Intercept	0.0519***	0.0488***	0.0447***	0.0479***	0.0299***
	(0.0128)	(0.0146)	(0.0174)	(0.0159)	(0.0119)
R^2	0.4265	0.4031	0.2496	0.4714	0.4497
Observations	128	121	90	80	92

Notes:
* denotes significance at the 10% level; ** denotes significance at the 5% level; *** denotes significance at the 1% level.
Figures in parentheses are robust standard errors.

Table 3: Robustness Checks with Additional Control Variables

Ordinary least squares regressions of the cross section of countries
The dependent variable is the average annual growth rate of per capita GDP, 1995–2007

	Model VIII	**Model IX**	**Model X**	**Model XI**	**Model XII**
Government owned banks in 2001	0.0362***	0.0382***	0.0326***	0.0326***	0.0370***
	(0.0079)	(0.0072)	(0.0101)	(0.0074)	(0.0098)
Log of initial per capita GDP	-0.0059***	-0.0040***	-0.0066*	-0.0045**	-0.0044***
	(0.0017)	(0.0017)	(0.0018)	(0.0017)	(0.0018)
Regulatory quality	0.0147***	0.0113***	0.0167***	0.0096***	0.0137***
	(0.0039)	(0.0030)	(0.0034)	(0.0028)	(0.0029)
Transition	0.0310***	0.0282***	0.0325***	0.0321***	0.0220***
	(0.0051)	(0.0059)	(0.0076)	(0.0062)	(0.0046)
Oil exporter	0.0090*				
oil > 20% of exports	(0.0054)				
Inflation average 1995–2005		0.0000			
		(0.0051)			
Concentration			0.0025		
			(0.0075)		
FDI/GDP average				0.0011***	
				(0.0004)	
Privatisation					0.0043
					(0.0067)
Intercept	0.0592***	0.0471***	0.0640***	0.0467***	0.0471***
	(0.0132)	(0.0135)	(0.0159)	(0.0145)	(0.0159)
R^2	0.4983	0.4605	0.4363	0.4669	0.4750
Observations	103	124	95	116	80

Notes:
* denotes significance at the 10% level; ** denotes significance at the 5% level; *** denotes significance at the 1% level.
Figures in parentheses are robust standard errors.

Table 4: Extreme Bounds Analysis

Dependent variable: average annual growth rate of per capita GDP for 1995–2007

	$\beta_{government-owned\ banks}$	**Observations**	R^2	**Additional Z variables**	**Result**
Upper Bound	0.0602	87	0.5836	Inflation, Concentration, Liquid Liabilites	
Baseline	0.0359	128	0.4265	None	Robust
	(0.0072)				
Lower Bound	0.0044	85	0.5831	Inflation, FDI, Liquid Liabilities, Small country dummy	

Notes:
Variables included in every specification: Government-owned banks in 2001, initial GDP per capita, regulatory quality, transition. Doubtful (Z) variables: Liquid liabilities/GDP, openness, FDI, inflation rate, concentration, small country, oil exporter.
The upper bound estimate is the largest estimated coefficient + 2 (robust) standard errors; the lower bound estimate is the smallest estimated coefficient −2 (robust) standard errors; the baseline is coefficient estimate and robust standard error in parentheses.

Table 5: Government Ownership of Banks and Growth

IV regressions of the cross section of countries

Average annual per capita GDP growth rate 1995–2007	**Model I**	**Model II**	**Model III**	**Model IV**
Instrumental Variables				
Government owned banks in 2001	0.0404***	0.0274**	0.0478**	0.0424***
	(0.0067)	(0.0124)	(0.0219)	(0.0133)
Regulatory Quality		0.0194**		0.0218***
		(0.0086)		(0.0087)
Exogenous Variables				
Log of initial GDP per capita	-0.0040*	-0.0081	-0.0050***	-0.0094***
	(0.0022)	(0.0053)	(0.0018)	(0.0046)
Regulatory Quality	0.0123**		0.0134***	
	(0.0051)		(0.0052)	
Transition			0.0328***	0.0326***
			(0.0064)	(0.0065)
Intercept	0.0445*	0.0786	0.0523***	0.0875**
	(0.0169)	(0.0429)	(0.0125)	(0.0370)
χ^2 test of over-identifying	0.14	4.95	4.02	5.89
restrictions [p-value]	[0.70]	[0.08]	[0.13]	[0.21]
F-test for weak instruments	36.09		12.37	
	[0.00]		[0.00]	
R^2 (first stage regressions)				
Gov. ownership	0.3137	0.3722	0.2723	0.2377
Regulatory Quality		0.2504		0.1337
Observations	58	58	128	128
Instruments:				
all exogenous variables plus	Black market premium, bank failures 1995	Black market premium, bank failures 1995, latitude, Sub-Saharan Africa, East Asia	Anglo-Saxon legal origin, French legal origin, Socialist legal origin	Anglo-Saxon legal origin, French legal origin, Socialist legal origin, latitude, Sub-Saharan Africa, East Asia

Notes:

* denotes significance at the 10% level; ** denotes significance at the 5% level; *** denotes significance at the 1% level. Figures in parentheses are robust standard errors.

Table 6: Regulation-Government Ownership Trade-off

Panel A: Cross-country growth regressions

	Method of Estimation			
	OLS		**Instrumental Variables**	
	Baseline Model	Model with Interaction Term	Baseline Model	Model with Interaction Term
Government owned banks in 2001	0.0359***	0.0287***	0.0424***	0.0385**
	(0.0072)	(0.0075)	(0.0133)	(0.0192)
Log of initial per capita GDP	-0.0046***	-0.0059***	-0.0094**	-0.0095**
	(0.0015)	(0.0015)	(0.0046)	(0.0039)
Regulatory quality	0.0112***	0.0153***	0.0218***	0.0222***
	(0.0025)	(0.0028)	(0.0087)	(0.0073)
Transition	0.0324***	0.0315***	0.0326***	0.0328***
	(0.0063)	(0.0062)	(0.0065)	(0.0065)
Interaction Term		-0.0132***		-0.0048
		(0.0041)		(0.0121)
R^2	0.4265	0.4445		
Test of over-identifying restriction [p-value]			5.89 [0.21]	7.58 [0.18]
Observations	128	128	128	128

Panel B: Partial derivatives of growth with respect to government ownership of banks (using OLS estimates)

Level of Regulatory Quality				
10^{th} percentile	25^{th} percentile	Median	75^{th} percentile	90^{th} percentile
0.0448***	0.0371***	0.0309***	0.0189***	0.0100
(0.0076)	(0.0072)	(0.0070)	(0.0090)	(0.0110)

Notes:
* denotes significance at the 10% level; ** denotes significance at the 5% level; *** denotes significance at the 1% level.
Figures in parentheses are robust standard errors.

Data Appendix

Description of Variables and Data Sources

Variable	Dates	Number of Observations	Definition / Source
Average annual GDP per capita growth rate	1995–2007 2000–2007	177	In 2005 US$, http://www.ers.usda.gov/Data/
Average annual GDP growth rate	1995–2007 2000–2007	173 177	World Economic Outlook database
Inflation average	1995–2005	177	World Economic Outlook database
Initial GDP per capita	1999	177	World Economic Outlook database
Initial GDP per capita	1995	173	In 2005 US$, http://www.ers.usda.gov/Data/
Government owned banks	1995	92	Share of assets of the top ten banks controlled by the government at the 50% level: LLS dataset available from http://mba.tuck.dartmouth.edu/pages/faculty/rafael.laporta/publications
Government owned banks	1999 2001 2005	103 134 110	"What fraction of the banking system's assets is in banks that are 50% or more government owned as of yearend". Caprio et al. (2008), permanent URL: http://go.worldbank.org/SNUSW978P0. 1999 data from original database, 2001 data from 2003 database; 2005 data from 2007 database
Regulatory Quality (Rule of Law and Corruption for robustness checks)	Average of 1998, 2000, 2002–2005	185	Measures whether regulation aids the functioning of private markets (including banking supervision). It also measures whether the regulatory burden is perceived to be excessive, undermining private business. Kaufmann et al. (2005), permanent URL: http://go.worldbank.org/V9IMLWZ4C1
Secondary education	First post-1995 observation	95	Percentage of labour force with completed secondary education (% secondary education + % tertiary education). World Development Indicators, December 2008
Openness	Average 1995–2005	165	Export Share / GDP + Import Share / GDP. World Development Indicators, December 2008
FDI	Average 1995–2005	160	Net Foreign Direct Investment / GDP. World Development Indicators, December 2008
Privatisation	1970, 1995	92	(Government ownership of banks in 1970) - (Government ownership of banks in 1995): LLS dataset available from http://mba.tuck.dartmouth.edu/pages/faculty/rafael.laporta/publications
Financial Development (Liquid liabilities/GDP)	1995	147	Beck, Demirguç-Kunt and Levine (2000)
Oil Exporters Dummy	1980–99	138	Countries in which average oil exports exceed 20% of exports. Calculated from Fearon (2005).
Transition Countries Dummy	1988	185	Countries of the Former Soviet Union and the Central and Eastern European members of the former Warsaw Pact

List of Countries

Albania, Algeria, Antigua and Barbuda, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahrain, Belarus, Belgium, Belize, Benin, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Cambodia, Canada, Chile, China, Colombia, Costa Rica, Cote d'Ivoire, Croatia, Cyprus, Czech Republic, Denmark, Dominica, Ecuador, Egypt, El Salvador, Estonia, Fiji, Finland, France, Germany, Ghana, Greece, Grenada, Guatemala, Guinea, Hong Kong SAR, Hungary, Iceland, India, Indonesia, Iran, Iraq, Israel, Italy, Japan, Jordan, Kazakhstan, Kenya, Korea, Kuwait, Kyrgyzstan, Latvia, Lebanon, Lesotho, Lithuania, Luxembourg, Macau, Macedonia, Madagascar, Malaysia, Mali, Malta, Mauritius, Mexico, Moldova, Morocco, Myanmar, Namibia, Netherlands, New Zealand, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Puerto Rico, Russia, Rwanda, Saudi Arabia, Senegal, Seychelles, Singapore, Slovakia, Slovenia, South Africa, Spain, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Sudan, Suriname, Swaziland, Sweden, Switzerland, Taiwan Province of China, Tajikistan, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, Vanuatu, Venezuela, Vietnam, Yemen, Zimbabwe

Summary Statistics of Key Variables

Variable	Observations	Mean	Std. deviation	Minimum	Maximum
GDP per cap growth average 1995–2007	123	2.938	2.307	-2.857	15.150
GDP per cap growth average 2000–2007	123	3.330	2.931	-5.477	16.676
Government ownership of banks 2001	142	0.202	0.280	0.000	1.000
ln GDP 1995	124	8.196	1.525	3.918	10.907
ln GDP 2000	124	8.315	1.539	3.895	11.141
Inflation average 1995–2005	121	13.884	29.097	-0.070	197.474
Regulatory Quality	123	0.293	0.885	-1.987	1.889
Liquid Liabilities	108	0.536	0.421	0.063	2.887
Openness	121	88.257	44.890	21.128	296.321
Foreign Direct Investment	113	4.195	4.143	0.063	22.099

Pairwise Correlation of Key Variables

	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
[1] GDP per cap growth average 1995–2007	0.2341	-0.0522	0.2035	-0.0124	0.0758	0.4169	-0.0578	0.1194	0.4877
[2] Government ownership of banks 2001		-0.2894	0.2424	-0.4468	0.2383	0.0023	-0.1633	-0.1185	-0.0480
[3] Log GDP 1995			-0.1283	0.8116	0.1279	-0.0710	0.5721	0.2665	0.0503
[4] Inflation average 1995–2005				-0.2674	0.2257	0.1527	-0.2236	0.0119	0.0970
[5] Regulatory Quality					-0.2232	-0.0617	0.5465	0.2643	0.0042
[6] Oil						0.0072	-0.0277	0.0018	0.0320
[7] Transition							-0.1740	0.1379	0.0206
[8] Liquid Liabilities								0.4569	0.0899
[9] Openness									0.4191
[10] FDI									