Government Ownership of Banks, Institutions and Economic Growth

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We present new cross-country evidence that reveals that during 1995–2007, government ownership of banks has been robustly associated with higher long-run growth rates. We also 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.

INTRODUCTION

In their attempt to prevent financial meltdown in the autumn of 2008, governments in many industrialized 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 USA 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.

We show in this paper that such views are not well-founded. Our empirical findings, which utilize 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 utilizes 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 privatizing banks in developing countries (see, for example, World Bank 2001).

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 to address coordination problems that could prevent socially beneficial investments from being funded. More broadly, Acemoglu et al. (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 et al. (2008) show that government-owned banks may be more effective
in mobilizing 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, 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 2007–8, 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 et al. 2009; Johnson 2009; Kane 2009, 2010) suggest that banks in developed countries (which happened to be mainly private) behaved opportunistically by adopting excessively risky strategies aimed at maximizing short-term trading surpluses, and implicitly or explicitly relying on government safety-nets to cover downside risks. Such strategies can undermine the growth-promoting role of banks by creating a wedge between the private and social returns of their activities.\(^5\)

Our contribution, which is empirical in nature, is two-pronged. First, 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 et al. 2005), which previous empirical literature has found to be significant (Knack and Keefer 1995; Hall and Jones 1999; Acemoglu et al. 2001; Rodrik et al. 2004; Demetriades and Law 2006). These new findings suggest that the support for the ‘political’ view of government banks previously received from cross-country regressions is fragile.\(^6\) 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 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 I summarizes the two datasets that we utilize, and their sources. Section II contains our empirical contribution, which provides robust evidence of a positive association between government ownership of banks and economic growth. Section III summarizes and offers some ideas for further research.

I. 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 Tables V and 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 utilize 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 Economic Research Service (US Department of Agriculture). Data on institutional quality are from the Kaufmann et al. (2005) Quality of Governance dataset. We create the average value of each institutional quality variable from all the available databases spanning 1998–2005.\(^7\) 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. The second is a dummy for all net oil exporters: we use the Fearon (2005) primary commodity export measure, and construct a dummy for all countries where on average oil exports exceed 20% of exports. This is to control for countries that have grown quickly 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 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 (0.866), and the correlation between the CLB 1999 and 2001 observations is slightly lower (0.721). The correlations between the LLS 1995 variable and the CLB 2001 and 2005 variables are 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 privatization under the ‘Washington consensus’, a number of countries have preserved often significant shares of government ownership of banks.

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 maximize data availability. The series is highly correlated with the Barro and Lee (2000) dataset on the average number of years of schooling. For both

![Figure 1. Government ownership of banks, 2001.](image)
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 that we utilize 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.

II. EMPIRICAL ANALYSIS

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 Tables V and VI, respectively) that we replicated and are reporting for comparison purposes. The third and fourth columns 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 $R^2$-squared 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 run numerous other models, which 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.9

To summarize, 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 that 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 regressions, government ownership acts as a proxy for the missing fundamental variable. This explains the LLS results. However, once 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 publicized 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.

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 dataset of 128 countries. The coefficient on government ownership is positive and significant at the 1% level. Its magnitude of 0.036 is quite large, suggesting that countries with 50% government ownership grew by 1.8% per annum more than countries without government-owned banks, all other things being equal. Moreover, the remaining coefficients have the
### Table 1

**Robustness Checks of LLS**

| Ia | IIa | IIIa | IVa |
|----|-----|------|-----|
| GB70 [gbbp_70] | -0.0199*** | -0.0152* | -0.0045 |
| | (0.0071) | (0.0091) | (0.0064) |
| Log of initial GDP per capita [logy60f] | -0.0160*** | -0.0157*** | -0.0211*** |
| | (0.0033) | (0.0042) | (0.0028) |
| Average years of schooling [ysch_av] | 0.0061*** | 0.0044*** | 0.0028*** |
| | (0.0013) | (0.0018) | (0.0011) |
| 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 | | 0.0040*** |
| | | | (0.0010) |
| Property rights [prop_hf9] | omitted | | 0.0081*** |
| | | | (0.0029) |
| Intercept | 0.0911*** | 0.1019*** | 0.0764*** |
| | (0.0171) | (0.0212) | (0.0137) |
| Regional dummies | No | Yes | No |
| | | | Yes |
| \( R^2 \) | 0.3403 | 0.5012 | 0.5416 |
| | | | 0.6390 |
| Observations | 85 | 82 | 83 |

**Notes**

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. All variables are defined in La Porta et al. (2002) and taken from their database available at [http://mba.tuck.dartmouth.edu/pages/faculty/rafael.laporta/publications.html](http://mba.tuck.dartmouth.edu/pages/faculty/rafael.laporta/publications.html) (accessed 12 June 2011).

* Denotes significance at the 10% level, ** at the 5% level, *** at the 1% level.

Figures in parentheses are robust standard errors.
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 per annum. The third column excludes countries with population less than 4 million, which results in a reduction in the number of countries to 92. Nonetheless, the coefficient of interest if anything rises slightly compared to the first column, suggesting that small countries are not driving the results.

The fourth column of Table 2 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. The fifth column utilizes 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, foreign direct investment (FDI) and bank privatization, added one at a
time. Of these additional control variables, only two appear significant, namely 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 value is rather large, suggesting that 50% government ownership of banks is associated with 1.6–1.9 higher growth per annum.

**Extreme bounds analysis**

Additional robustness checks are reported in Table 4, which summarizes 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. The baseline regression includes the variable of interest and a group of ‘focus’ variables, which in our case includes 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 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 rationalized by alluding to the literature that emphasizes 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) FDI as a ratio of GDP; (v) banking concentration; (vi) a small country dummy; (vii) an 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 seven additional 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.

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 increases by

| $\beta_{\text{government-owned banks}}$ | Observations | $R^2$ | Additional Z-variables | Result |
|----------------------------------------|--------------|-------|------------------------|--------|
| Upper bound                            | 0.0602       | 87    | 0.5836                 | Inflation, concentration, liquid liabilities |
| Baseline                               | 0.0359 (0.0072) | 128   | 0.4265                 | None Robust |
| Lower bound                            | 0.0044       | 85    | 0.5831                 | Inflation, FDI, liquid liabilities, small country dummy |

Notes
Dependent variable: average annual growth rate of per capita GDP for 1995-2007.
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 plus 2 (robust) standard errors; the lower bound estimate is the smallest estimated coefficient minus 2 (robust) standard errors; the baseline is coefficient estimate. Figures in parentheses are robust standard errors.
Even if the long-run relationship is homogeneous across countries, it does not necessarily follow that the direction of causality is the same across countries. 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 rationalize 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, in addition, institutions designed to contain them are weak, governments may choose to nationalize banks. Such failures would of course correlate negatively with GDP growth, so arguably the coefficients of government ownership of banks on growth in OLS regressions may display downward bias.

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, insofar as this is feasible. To this end, Table 5 reports results from instrumental variable (IV) regressions designed to shed further light on this issue. We utilize 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 dataset, 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. 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 utilize latitude and regional dummies as additional instruments. The first instrument is in line with a large literature searching instruments for institutional quality that emphasizes the disease environment encountered by settlers from colonizing powers as one of the primary determinants that shaped the nature of a country’s 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 utilize legal origin dummies as an alternative set of instruments for government ownership of banks. These variables, which are available for the entire dataset, are plausible instruments for government ownership of banks since legal origin is widely believed to be a good predictor of financial structure. 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 than others to have retained some government-owned banks, for historical reasons. However, pairwise correlations between legal origin dummies and
### Table 5
**Government Ownership of Banks and Growth**

|                          | Model I       | Model II      | Model III     | Model IV      |
|--------------------------|---------------|---------------|---------------|---------------|
| **Average annual per capita GDP growth rate 1995–2007** |               |               |               |               |
| **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**      |               |               |               |
|                          | (0.0086)      |               |               |               |
| **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)      |
| χ² test of overidentifying restrictions | 0.14          | 4.95          | 4.02          | 5.89          |
|                          | [0.70]        | [0.08]        | [0.13]        | [0.21]        |
| F-test for weak instruments | 36.09        | 12.37         |               |               |
|                          | [0.00]        |               |               |               |
| R² (first-stage regressions): |             |               |               |               |
| Government ownership     | 0.3137        | 0.3722        | 0.2723        | 0.2377        |
|                          |               |               |               |               |
| Regulatory quality       | 0.2504        |               |               |               |

**Note:** Significance levels: *p < 0.1, **p < 0.05, ***p < 0.01.
| Average annual per capita GDP growth rate 1995–2007 | Model I | Model II | Model III | Model IV |
|---------------------------------------------------|---------|----------|-----------|----------|
| 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 Sub-Saharan Africa, East Asia |         |          |           |          |

**Notes**
IV regressions of the cross-section of countries.
*Denotes significance at the 10% level, ** at the 5% level, *** at the 1% level.
Figures in parentheses are robust standard errors; figures in square brackets are p-values.
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 overidentifying 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 $R^2$.

Starting with column 1 in Table 5, it can be noted that the coefficient of interest remains positive and highly significant. If anything, it is slightly higher than 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 overidentifying 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 from those obtained with OLS. Moreover, the overidentifying restrictions cannot be rejected at the 5% level, and the diagnostics from both of the first-stage regressions indicate that the instruments are not weak.

In column 3, where 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 overidentifying 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 significant 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 overidentifying restrictions cannot be rejected, and the diagnostic statistics do not indicate that the instruments are weak.

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 standardized 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 10th percentile of regulatory quality, the derivative is 0.0448 and is significant at the 1% level. It declines to 0.0371 at the 25th percentile, and then to 0.0309 at the median level, remaining significant at the 1% level. At the 75th percentile, the derivative declines to 0.0189 and is significant at the 5% level. At the 90th 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.

The conclusions in the paragraph above must, however, be treated with caution because the IV estimates reported in Panel A indicate that the interaction term is no longer significant. This is perhaps not too surprising as the IV estimates have been obtained treating as endogenous not only government ownership but also regulatory quality and the interaction term. To obtain them we used the legal origin/regional dummies/latitude instrument set, adding interactions between legal origins and latitude to act as instruments for the interaction term. The results are not sensitive to adding additional interaction terms to the instrument set. They 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. Thus while the positive association between government-owned banks and growth remains robust to IV estimation in the presence of the interaction term, we cannot be as confident that it weakens with better regulation.

Summary

To sum up, the evidence that 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 privatization from the regressions. 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
### 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*** | −0.0132*** | 0.0048 | −0.0048 |
|                       | (0.0041) | (0.0041) | (0.0121) | (0.0121) |
| $R^2$ | 0.4265 | 0.4445 | 5.89 | 7.58 |
| Test of overidentifying restriction | | | [0.21] | [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 | 10th percentile | 25th percentile | Median | 75th percentile | 90th 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, ** at the 5% level, *** at the 1% level.

Figures in parentheses are robust standard errors; figures in square brackets are $p$-values.
found strong support for this hypothesis from OLS regressions, which suggest that the effect is sizeable in weak regulatory environments but becomes insignificant when regulation reaches the top 10% international standard. This result, although sensitive to estimation method, indicates that government-owned banks may be an effective substitute for good regulation.

III. 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. 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 generalized. Indeed, a growing body of evidence suggests that publicly 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).

There are a number of avenues for future research emanating from this paper. It could be fruitful to reexamine 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 became 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.

DATA APPENDIX

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.

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| Variable                                      | Dates                              | Number of observations | Definition/Source                                                                 |
|-----------------------------------------------|------------------------------------|------------------------|----------------------------------------------------------------------------------|
| Average annual GDP per capita growth rate     | 1995–2007                          | 177                    | In 2005 US$, http://www.ers.usda.gov/Data.                                         |
|                                               | 2000–7                             | 177                    | World Economic Outlook database.                                                  |
| Average annual GDP growth rate                | 1995–2007                          | 173                    | World Economic Outlook database.                                                  |
|                                               | 2000–7                             | 177                    | World Economic Outlook database.                                                  |
| Inflation average                             | 1995–2005                          | 177                    | World Economic Outlook database.                                                  |
| Initial GDP per capita                        | 1999                               | 177                    | In 2005 US$, http://www.ers.usda.gov/Data.                                         |
| Initial GDP per capita                        | 1995                               | 173                    | 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                        | 1995                               | 92                     | ‘What fraction of the banking system’s assets is in banks that are 50% or more government-owned as of year end?’ Caprio et al. (2008), http://go.worldbank.org/SNUSW978P0. 1999 data from original database; 2001 data from 2003 database; 2005 data from 2007 database. |
| Government-owned banks                        | 1999                               | 103                    | ‘What fraction of the banking system’s assets is in banks that are 50% or more government-owned as of year end?’ Caprio et al. (2008), 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, 2002–5 | 185                    | Measures whether regulation aids the functioning of private markets (including banking law and supervision). It also measures whether the regulatory burden is perceived to be excessive, robustness checks undermining private business. Kaufmann et al. (2005), 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. |
| Variable          | Dates               | Number of observations | Definition/Source                                                                 |
|-------------------|---------------------|------------------------|----------------------------------------------------------------------------------|
| Openness          | Average 1995–2005   | 165                    | Export share/GDP + Import share/GDP. World Development Indicators, December 2008. |
| FDI               | Average 1995–2005   | 160                    | Net FDI/GDP. World Development Indicators, December 2008.                        |
| Privatization     | 1970, 1995          | 92                     | (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 | World Bank: a new Database on Financial Development and Structure (updated November 2008). See Beck et al. (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. |
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NOTES

1. See, for example, the article by Martin Wolf (2008), which aptly summarizes 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’.

3. Specifically, bank-level studies suggest that in Germany and Russia, public banks are more efficient than private banks (Altunbas et al. 2001; Karas et al. 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 that they financed (Demetriades et al. 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 1970s and 1980s. Zhang and Underhill (2003) provide a similar analysis of East Asian liberalizations that led to crises in the late 1990s.

5. For a theoretical model that demonstrates this point, see our working paper version of this paper (Andrianova et al. 2010).

TABLE A2
SUMMARY STATISTICS OF KEY VARIABLES

| Variable                                      | Observations | Mean  | S.D.  | Minimum | Maximum |
|-----------------------------------------------|--------------|-------|-------|---------|---------|
| GDP per capita growth average 1995–2007       | 123          | 2.938 | 2.307 | −2.857  | 15.150  |
| GDP per capita 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   |
| Log GDP 1995                                  | 124          | 8.196 | 1.525 | 3.918   | 10.907  |
| Log 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 |
| FDI                                           | 113          | 4.195 | 4.143 | 0.063   | 22.099  |

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**Table A3**

**Pairwise Correlation of Key Variables**

|       | [2]  | [3]  | [4]  | [5]  | [6]  | [7]  | [8]  | [9]  | [10] |
|-------|------|------|------|------|------|------|------|------|------|
| [1]   | GDP per capita 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 | 0.0077 | 0.0048 | 0.0042 |
| [7]   | Transition | −0.1740 | 0.1379 | 0.0206 |
| [8]   | Liquid liabilities | 0.4569 | 0.0899 |
| [9]   | Openness | 0.4191 |
6. We hasten to add that this does not necessarily invalidate case studies that provide support to this view (World Bank 2001), although one must also acknowledge case studies that provide support to the developmental view.

7. The table of pairwise correlations in the Data Appendix (Table A3) 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.

8. The table of pairwise correlations in the Data Appendix (Table A3) shows that transition has been strongly associated with a strong growth performance in the period 1995–2007.

9. Some of these can be found in Andrianova et al. (2009).

10. 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 et al. (2000).

11. 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).

12. See, for example, Rodrik (2005), who argues 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.

13. 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.

14. 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 et al. 2009), which is the main reason why we are slightly sceptical of its ability to predict financial structure.

15. Andrianova et al. (2009) show that privatization has a positive effect only when the transition dummy is omitted when it appears to act as a rather crude proxy for transition.

16. This is in the sense that, all other things being 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 privatized their banking systems. This is 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 for this view.

17. See also Ang (2011), who finds that financial liberalization measures that include bank privatization have a negative and significant effect on technological innovation.

REFERENCES

ACEMOGLU, D., GOLOSOV, M. and TSYVINSKI, A. (2008). Markets versus governments. Journal of Monetary Economics, 55, 159–89.

———, JOHNSON, S. and ROBINSON, J. A. (2001). The colonial origins of comparative development. American Economic Review, 91(5), 1369–401.

———, ———— and ———— (2005). Institutions as a fundamental cause of long-run growth. In P. AGHION, and S. N. DURLAUF(eds), Handbook of Economic Growth, Vol. 1. Amsterdam: Elsevier/North-Holland, pp. 385–472.

ALTUNBAS, Y., EVANS, L. and MOLYNEUX, P. (2001). Bank ownership and efficiency. Journal of Money, Credit and Banking, 33(4), 926–54.

ANDRIANOVA, S., DEMETRIADES, P. O. and SHORTLAND, A. (2008). Government ownership of banks, institutions, and financial development. Journal of Development Economics, 85, 218–52.

———, ———— and ———— (2009). Is government ownership of banks really harmful to growth? University of Leicester Discussion Paper no. 09/11.

———, ———— and ———— (2010). Government ownership of banks, institutions, and economic growth. University of Leicester Discussion Paper no. 11/01.

ANG, J. (2011). Financial development, liberalization and technological deepening. European Economic Review, 55(5), 688–701.

ARESTIS, P. and DEMETRIADES, P. (1997). Financial development and economic growth: assessing the evidence. Economic Journal, 107, 783–99.

ARMOUR, J., DEAKIN, S., LELF, P. and SIEMS, M. (2009). How do legal rules evolve? Evidence from a cross-country comparison of shareholder, worker and creditor protection. American Journal of Comparative Law, 57, 579–629.

BARRO, R. J. and LEE, J. W. (2000). International data on educational attainment: updates and implications. CID Working Paper no. 42.
BECK, T., DEMIRGÜRÇ-KUNT, A. and LEVINE, R. (2000). A new database on financial development and structure. *World Bank Economic Review*, 14, 597–605.

BOUGHEAS, S., DEMETRIADES, P. and MAMUNEAS, T. (2000). Infrastructure, specialization and economic growth. *Canadian Journal of Economics*, 33(2), 506–22.

CAPRO, G., LEVINE, R. and BARTh, J. (2008). *Bank Regulation and Supervision*; available online at http://go.worldbank.org/SNUSW978P0 (accessed 12 June 2011).

DEMETRIADES, P. O. and HUSSEIN, K. A. (1996). Does financial development cause economic growth? Time-series evidence from 16 countries. *Journal of Development Economics*, 51, 387–411.

——— and LAW, S. H. (2006). Finance, institutions and economic development. *International Journal of Finance and Economics*, 11, 245–60.

———, DU, J., GIRMA, S. and XU, C. (2008). Does the Chinese banking system promote the growth of firms? University of Leicester Discussion Paper in Economics no. 08/6.

DIAZ-ALEJANDRO, C. (1985). Good-bye financial repression, hello financial crash. *Journal of Development Economics*, 19, 1–24.

FEARON, J. (2005). Primary commodity exports and civil war. *Journal of Conflict Resolution*, 49, 483–507.

GERSCHENKRON, A. (1962). *Economic Backwardness in Historical Perspective. A Book of Essays*. Cambridge, MA: Harvard University Press.

HALL, R. E. and JONES, C. (1999). Why do some countries produce so much more output per worker than others? *Quarterly Journal of Economics*, 114(1), 83–116.

IGAN, D., MISHRA, P. and TRESSEL, T. (2009). A fistful of dollars: lobbying and the financial crisis. IMF Research Department.

JOHNSON, S. (2009). The quiet coup. *The Atlantic Online*, May.

KANE, E. (2009). Unmet duties in managing financial safety nets. Networks Financial Institute Policy Brief no. 2009-PB-06.

——— (2010). The importance of monitoring and mitigating the safety-net consequences of regulation-induced innovation. *Review of Social Economy*, 68(2), 145–61.

KARAS, A., SCHOORS, K. and WEILL, L. (2008). Are private banks more efficient than public banks? Evidence from Russia. BOFIT Discussion Paper no. 3/2008, Bank of Finland.

KAUFMANN, D., KRAAY, A. and MASTRUTTI, M. (2005). Governance matters IV: governance indicators for 1996–2004. World Bank Policy Research Working Paper no. 3630.

KNACK, S. and KEEFER, P. (1995). Institutions and economic performance: cross-country tests using alternative institutional measures. *Economics and Politics*, 7, 207–27.

LA PORTA, R., LOPEZ-DE-SILANES, F. and SHLEIFER, A. (2002). Government ownership of banks. *Journal of Finance*, 57(1), 265–301.

LEAMER, E. E. (1983). Let’s take the con out of econometrics. *American Economic Review*, 74(1), 31–43.

RODRIK, D. (2005). *Why we learn nothing from regressing economic growth on policies*. Mimeo, Harvard University.

———, SUBRAMANIAN, A. and TREBBI, F. (2004). Institutions rule: the primacy of institutions over geography and integration in economic development. *Journal of Economic Growth*, 9, 131–65.

ROUSSEAU, P. and XIAO, S. (2007). Banks, stock markets, and China’s Great Leap Forward. *Emerging Markets Review*, 8, 206–17.

WOLF, M. (2008). A policy success amid the disaster. *Financial Times*, 16 October.

WORLD BANK (2001). *Finance for Growth: Policy Choices in a Volatile World*. Oxford: Oxford University Press.

ZHANG, X. and UNDERHILL, G. (2003). Private capture, policy failures and financial crisis: evidence from South Korea and Thailand. In G. UNDERHILL, and X. ZHANG (eds), *International Financial Governance Under Stress*. Cambridge: Cambridge University Press.