IMF Working Paper

Fiscal Policy and Financial Development

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INTERNATIONAL MONETARY FUND

IMF Working Paper

Fiscal Affairs Department

Fiscal Policy and Financial Development

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Authorized for distribution by Manmohan S. Kumar

January 2006

Abstract

We examine the effects of public sector borrowing from the domestic banking system on financial development in middle-income countries. While these countries' external debt has been falling, the share of bank credit absorbed by the public sector has been rising rapidly. We argue that this runs the risk of slowing financial development by affecting structural characteristics of the banking systems. We find empirical evidence that too much public sector borrowing harms financial deepening, and that banks mainly lending to the public sector tend to be more profitable but less efficient. We note that these effects add to the costs of fiscal prolificacy.

JEL Classification Numbers: G21, H6

Keywords: Bank efficiency; bank profitability; fiscal policy; financial development..

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Contents   Page

I. INTRODUCTION

Many developing country governments have reduced their external indebtedness over recent years and increasingly rely on domestic financing which is often seen as preferable over riskier external debt (see the original sin literature, e.g., Eichengreen and Hausmann, 2005). Yet the rapid rise in domestic bank borrowing by many governments begs the question of the policy trade-offs involved if it were to negatively affect financial development which has been shown in the literature to be associated with lower growth and magnified macro risks.[2]

However, the potential impact of fiscal policy on financial development is a neglected issue. Mostly, it has been associated with a positive role of government debt in developing financial sectors (Kumhof and Tanner, 2005). On the negative side, it is well-known that financial repression and inflation, which are detrimental to financial development and growth (Roubini and Sala-i-Martin, 1992; Boyd and others, 2001), tend to be rooted in governments' fiscal needs (Bencivenga and Smith, 1992; Catão and Terrones, 2005).

Here, we argue that continuously large public sector borrowing from the domestic banking sector can have substantial adverse implications for financial development. We examine this issue from a macro and a micro perspective for 73 middle-income countries,[3] most of whom have a financial sector to speak of, but continue to face challenges in its further development.

Section II explores how important public sector borrowing is in middle-income countries, and finds that the public sector absorbs a large share of available credit in many of them. We also find that this share has risen rapidly over the past ten years with external debt being replaced with domestic borrowing. Exploring what country characteristics tend to be associated with increasing shares of public sector credit, we find that, while it is not related to the income level, it tends to be associated with slower growth, more government intervention in the economy, more government bank ownership, and weaker creditor rights.

Section III discusses how large public sector borrowing could harm financial development through its impact on the structural characteristics of the banking sector. Specifically, banks mostly lending to the public sector can be expected to be relatively profitable but inefficient, as banks tend to earn easy profits, engage in little client competition, have special incentives to collude, and are often government-owned (La Porta and others, 2002). In the long run, these side effects of public sector borrowing could harm financial deepening, and thus at least partly offset a positive impact of public sector borrowing on banking system liquidity.

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[2] On growth, see, e.g., King and Levine (1993), Levine (1997, 2005), Rajan and Zingales (1998), Khan and Senhadji (2000), Claessens and Laeven (2003), Fisman and Love (2004), and, e.g., Trew (2005) for a dissenting view. On macro risks, see, e.g., Caballero and Krishnamurthy (2004) and Cecchetti and Krause (2001).

[3] The 73 countries (Appendix Table A1) are those meeting three criteria: (1) defined as developing or emerging market economies according to the IMF *World Economic Outlook* April 2005 and among the top 100 of these economies at end-2004 both by (2) GNI per person and (3) GDP, both evaluated at purchasing power parities.

Sections IV and V examine whether public sector credit affects, respectively, the depth and the quality of financial development. In macro regressions on the determinants of financial depth, we find nonlinear effects of public sector borrowing on financial deepening: some of it helps, but too much of it hurts. In other words, a positive effect of public sector borrowing tends to weaken and become negative at very large shares of public sector borrowing. In micro regressions for 2,800 banks in the 73 countries, we find significant evidence that more lending to the public sector tends to raise the profitability but reduce the efficiency of banks.

Section VI concludes that these negative implications on the depth and quality of financial development add to the costs of fiscal prolificacy in developing countries. They must be given appropriate consideration when weighing the costs and benefits of fiscal deficits and should also dampen excessive enthusiasm about a shift from external to domestic borrowing.

II.   How Important Is Public Sector Credit, and Where?

The public sector soaks up a substantial share of credit in many developing countries. It absorbs more than 20 percent of total bank credit in more than half of a sample of 73 middle-income countries, and more than 50 percent in 13 of the countries (see Appendix Table A1).

Moreover, the share of public sector credit has also been rising rapidly in many developing countries over recent years (Figure 1). While public sector credit remains much smaller than external debt, it has been notching up slowly since the beginning of the 1990s, while external indebtedness has declined markedly.[4] Combined with crises-induced shrinkages of some banking sectors, this has contributed to a dramatic rise in the average ratio of public sector credit to total credit since the mid-1990s, from 18 percent to more than 27 percent. There appears to be a broad trend to replace external with domestic borrowing: of the countries that reduced their external debt ratio from 1990 to 2003, about four-fifths increased their ratio of public sector credit to GDP; while this could also be due to financial deepening, about two-thirds of the countries also increased their ratio of public sector credit to total bank credit.

What are the typical characteristics of countries with high public sector credit? Table 1 shows simple correlations and univariate regressions of the share of public sector credit in total credit (PUBLIC) against a number of country characteristics. The first panel shows that PUBLIC is unrelated to income levels, but is significantly negatively related to growth. Countries with higher PUBLIC also tend to have higher external debt, although the relationship is not statistically significant. There is no relationship with the fiscal deficit, probably because domestic bank credit is only one way to finance it. The second panel shows that countries with higher PUBLIC tend to have more government intervention in the economy, more trade restrictions, a larger public sector, and more government ownership in the banking sector. The third panel shows that banking sectors mainly lending to the government tend to be less free to conduct business, face more problems in assessing credit

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[4] See Guidotti and Kumar (1991) on the relationship between domestic and external debt, and Hauner and Kumar (2005) for a discussion of the development of external debt in emerging market countries since 1990.

Figure 1. Public Sector Credit and External Debt

(Percent, Average of 45 Middle-Income Countries 1/)
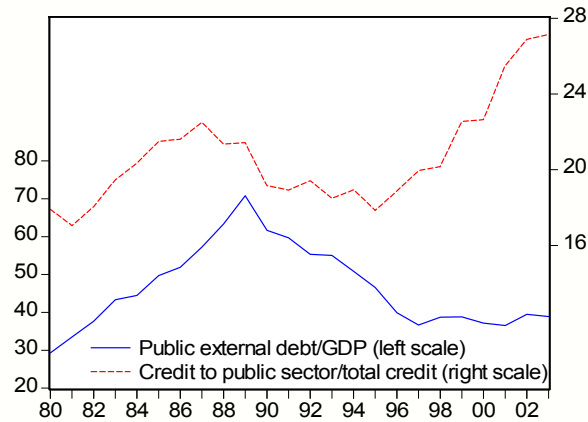
Sources: IMF International Financial Statistics (IFS), World Economic Outlook (WEO), and author's calculations.
1/ 28 of the 73 countries are omitted due to insufficiently long series.

Table 1. Public Sector Credit and Country Characteristics

Independent Variable	Correlation	Regression Coefficient		Observations
Macroeconomy				
Per capita income	0.01	0.47	(7.85)	73
Per capita growth	-0.21	-1.72***	(0.66)	73
Public external debt	0.15	0.12	(0.10)	65
Fiscal deficit	0.02	-0.13	(0.96)	69
Government Intervention				
Overall government intervention	0.21	4.59*	(2.52)	72
Trade restrictions	0.26	4.61**	(2.11)	72
Share of public sector in output	0.33	1.86***	(0.42)	35
Government ownership in banks	0.30	18.74**	(9.37)	55
Ease of Banking				
Banking sector freedom	-0.24	-4.91**	(2.46)	72
Cost of enforcement	0.21	0.25***	(0.08)	68
Credit information	-0.30	-2.96**	(1.40)	68
Deposit insurance	0.19	0.33*	(0.20)	73
Banking crises	-0.19	-0.87*	(0.52)	73
Region and Legal Origin				
Africa	0.02	1.14	(7.05)	73
Europe	0.06	2.93	(5.31)	73
Middle East	0.14	7.45	(6.84)	73
South America	-0.24	-10.73**	(4.52)	73
English legal origin	-0.06	-2.99	(5.49)	73
French legal origin	0.08	2.95	(4.58)	73
Socialist legal origin	-0.03	-1.28	(4.59)	73

Source: Author's calculations.
Notes: See Appendix Table A2 for definitions. Dependent variable is 2001-03 mean of PUBLIC. Constant included in all regressions. Robust standard errors in parentheses. Significance *** 1, ** 5, and * 10 percent.

quality and in recovering loans, but tend to be more stable and benefit from deposit insurance for a longer period. The fourth panel shows that PUBLIC is generally not related to regions or legal origin. Surprisingly, it is indeed the case that PUBLIC is relatively low in many South American countries, likely related to the prevalence of external financing in the region.

In sum, PUBLIC is prevalent in middle-income countries irrespective of their income level, but is typically higher in slower-growing countries with more interventionist policies and a difficult business environment for banks which would tend to increase the risk involved in lending to the private sector. The next section discusses why banks might prefer lending to the public sector in such an environment and how the resulting continuously large shares of public sector credit might harm financial development in the long run.

III. HOW PUBLIC SECTOR CREDIT COULD HARM FINANCIAL DEVELOPMENT

Large government bank borrowing could harm financial development through the structural characteristics of the banking sector. Specifically, large public sector credit could raise profitability, but lower efficiency. This would not only reduce the quality of financial development, but could also harm financial deepening in the long run, because inefficient banks mainly invested in relatively profitable public sector credit could have little drive to develop the banking market under the often difficult circumstances in developing countries, and as low efficiency could introduce a higher deadweight loss in intermediation.

Banks that lend mainly to the public sector could be more profitable if market distortions result in an insufficient interest rate premium on private sector lending. One such distortion is that banks would not want to lend to borrowers willing to pay interest rates above a certain level due to adverse selection (Stiglitz and Weiss, 1985). Other such distortions are interest rate ceilings on deposits or collusion among banks that can result in an interest rate level that is too high relative to the return on most private sector projects.

These distortions could result in a segmented credit market. Because the private sector would not be allowed or would not be able to pay the required premium over public sector credit, banks would first lend whatever they can to the government and only the remainder to the private sector. Indeed, while financial repression has been receding in many developing countries (Reinhart and others, 2003), continued large public sector bank lending suggests a preference on the banks' part (Kumhof and Tanner, 2005).

A back-of-the-envelope calculation seems to support that, on average, banks do not get a sufficient premium on private sector lending in many developing countries. Define the risk-adjusted return on risk-adjusted capital on a given loan as

$$\pi = \frac{\left(i_L - c - i_F - l - i_C\right)}{\left(r_c + r_M\right)}, \qquad (1)$$

where i_L is the interest on the loan; c are administrative costs; i_F are the refinancing costs; l is the expected loss on the loan; and i_C is the cost of capital, given by

$$i_C = \left(r_c + r_M\right) \cdot RoC, \qquad (2)$$

where r_C is credit and r_M market risk (losses beyond the expected loss), and RoC is the required return on capital. All these variables are in percent of the loan principal.

The required premium on private sector lending would likely need to compensate for higher administrative costs (e.g., due to more staff), a higher refinancing rate (if depositors require a risk premium from banks with riskier loans), a higher expected loss, and higher capital costs (due to higher risk of unexpected loss). To reduce the example to one intuitive dimension, assume that all variables are the same for private and public sector credit, except the lending rates and the expected loss. Based on the average lending rate–treasury bill rate differential for our 73 countries,[5] the "break-even" expected loss rate is then 7 percentage points, which is only about the same as the long-run average one-year default probability of corporate bonds rated "B" by Standard and Poor's (Bhatia, 2002)—very low given the risk backdrop of developing countries, even more so given assumptions grossly erring in favor of private sector lending.

Easy profits could also be one way how large public sector credit could reduce bank efficiency.[6] Moreover, governments that are heavily reliant on banking sector financing are likely to be reluctant to relinquish control over state-owned banks (see the result in Table 1) which have been shown to be less efficient than private banks (La Porta and others, 2002). Finally, banks mainly lending to the government are likely to have only a muted interest in competition: regarding price, there is an incentive for collusion in bond auctions; and regarding service, there is not much banks can differentiate in public sector lending.

IV. DOES PUBLIC SECTOR CREDIT AFFECT THE DEPTH OF FINANCIAL DEVELOPMENT?

Several previous studies have examined the determinants of financial depth, as measured by the degree of liquidity of an economy or the availability of private sector credit. The income level (positive) and past inflation (negative) were most consistently significant, while many other variables (from corruption to the quality of financial supervision) yielded mixed results.

Surprisingly, given the prominence of the "safe asset" hypothesis on the one hand and the "crowding out" hypothesis on the other, fiscal variables (if included at all) have frequently turned out as insignificant in examinations of the determinants of financial depth: Boyd and others (2001) find this for the ratio of central government expenditure to GDP, and Cuadro Saez and others (2003) for the deficit/GDP ratio. However, Detragiache and others (2005) do find some evidence that interest on public debt is positively related to the ratios of deposits

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[5] Average lending rates and treasury bill rates are available from IFS. The mean of 106 country-year observations over 2001–03 for the 73 countries listed in Appendix Table A1 is 5.7 percentage points.

[6] Note that the argument here looks at bank efficiency primarily from a production viewpoint: banks mainly lending to the public sector could have larger non-interest (overhead) costs. While this "production efficiency" is closely related to "intermediation efficiency," which refers to the size of the deadweight loss created by the transaction costs introduced by the financial sector, other factors, such as the degree of competition, also play a role.

and loans, respectively, and negatively to the ratio of private sector to total credit. Cottarelli and others (2005) also find a negative impact of public sector debt on private sector credit.

However, these fiscal variables probably just contain too much noise to reveal a relationship with financial depth: the overall deficit includes external financing, central bank financing, and nonbank financing; and for government expenditures the relationship is additionally obscured by government revenues and grants. All these quantities are unlikely to bear a strong relationship with domestic financial development.

Approach

Here, we use the fiscal indicator that can be expected to bear the closest relationship with the development of the domestic financial sector: domestic commercial banking system financing of the government, or the corresponding stock variable, credit of the commercial banking system to the public sector. Specifically, the ratio of bank credit to the public sector to total bank credit (PUBLIC) and to GDP (PUBY) are used as independent variables.

Three common (e.g., Levine, 1997) measures of financial depth are our dependent variables: LIQUID is the ratio of liquid liabilities of the banking system to GDP, measuring the overall size of the financial intermediary sector; BANK is the ratio of total bank credit to GDP; and PRIVATE is the ratio of bank credit to the private sector to GDP.[7] PRIVATE is most crucial here, because it was found to exert the strongest impact on growth (Levine and others, 2000).

These variables are closely related: BANK would usually amount to the lion's share of the assets and be split into PUBY and PRIVATE, with the ratio PUBY/BANK equal to PUBLIC. LIQUID, in turn, would usually amount to the lion's share of the liabilities. Note that the fact that BANK, PUBY, PUBLIC, and PRIVATE are linked through an identity and that BANK is bound to be highly correlated with LIQUID implies that regressing BANK, PRIVATE, and LIQUID on the levels of PUBY or PUBLIC would be estimating a tautology.

The argument here, however, is not about the obvious fact that at a given level of financial depth, more public sector borrowing will crowd out private sector credit. Rather, the more interesting question is what continuously large government bank borrowing does to financial deepening from a dynamic point of view. This is akin to viewing the importance of public sector credit as a structural characteristic of the banking sector that exerts its influence on financial development in the long term, similar to continuously high inflation or financial repression. Therefore, PUBY and PUBLIC are here not given by their levels, but by their long-run (1980–2003) averages. This avoids also the aforementioned econometric issues.

Both the determinants of the current level of financial depth and the change in financial depth over the past two decades are examined. The current level is given by the respective 2001–03 averages of LIQUID, BANK, and PRIVATE. The change is calculated as the difference between the 1980–82 and 2001–03 averages. While persistence could reintroduce the above-

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[7] See Appendix Table A2 for more precise definitions, sources and descriptive statistics.

mentioned econometric problem, the change regressions do prevent it. Averaging over three years has the advantage of smoothing out any potential year-to-year volatility, as it would be introduced in panel regressions. The choice of the time frame is based on data availability.

The multivariate regressions include control variables repeatedly identified in the literature as important determinants of financial development (expected signs in parentheses):[8] (i) the logarithm of INCOME (+), because the wealth of a country has unsurprisingly always turned out to be the strongest predictor of its degree of financial development; (ii) average annual INFLATION (−), because inflation history has tended to be found the second-most consistent predictor of financial development; and (iii) the average interest rate MARGIN (?), because it represents the transaction costs of financial intermediation; in a liberalized banking system, a high margin would tend to be due to low competition and be expected to harm financial development; financial repression, however, could force the margin below its competitive level, and then a higher margin would be expected to have a positive effect on financial development. The sign is thus a priori undetermined and depends on which effect dominates.

As PUBY and PUBLIC, also INFLATION and MARGIN enter as long-term (1980–2003) averages, because they can be expected to harm financial development gradually. Other variables, such as measures of financial liberalization, deposit insurance, or bank crises,[9] do not turn out as significant with a certain consistency. An unreported constant is included in the univariate and change regressions, but not the level regressions, where INCOME picks up most of its effect (see Appendix Tables A3 and A4 for variable definitions and correlations).

The following equations are estimated with OLS for each financial development indicator, once for the (2001–03) level:

$$Y_j^{01-03} = \alpha + \beta_1 X_j^{80-03} + \beta_2 INCOME_j^{01-03} + \beta_3 INFLATION_j^{80-03} + \beta_4 MARGIN_j^{80-03} + \varepsilon_j, \quad (3)$$

and once for the (1980–82 versus 2001–03) change:

$$\Delta_{01-03}^{80-82} Y_j = \alpha + \beta_1 X_j^{80-03} + \beta_2 \Delta_{01-03}^{80-82} INCOME_j + \beta_3 INFLATION_j^{80-03} + \beta_4 MARGIN_j^{80-03} + \varepsilon_j, \quad (4)$$

where j stands for a country, Y for one of the three indicators of financial depth, X for PUBY or PUBLIC, and, for example, Δ_{01-03}^{80-82} for the change from the 1980–82 to the 2001–03 mean.

Two hypothesis are tested. Table 2 shows the associated variables and expected signs on β_1. While PUBY is the more adequate variable for testing the hypothesis that public borrowing helps financial deepening by providing a safe asset, PUBLIC is more adequate for testing the hypothesis that, its own liquidity effect aside, public borrowing harms financial deepening: in

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[8] See, e.g., Boyd and others (2001), Cuadro Saez and others (2003), and Detragiache and others (2005).

[9] With data in Abiad and Mody (2005), Demirgüç-Kunt and Sobaci (2001), and Caprio and Klingebiel (2003).

the former case, it is desirable to let the liquidity effect of PUBY affect the financial depth indicators; in the latter case, precisely this is undesirable, and an indicator of public borrowing independent of its own liquidity effect is required. An increase in PUBY would be expected to increase the size of the banking sector (LIQUID, BANK), while the impact on private sector credit (PRIVATE) is a priori unclear. In line with the previous discussion, an increase in PUBLIC should be expected to lower all three financial development variables.

Table 2. Expected Signs in the Regressions

Hypothesis	Y	X	β_1
(1) Government bank borrowing helps financial depth by providing liquidity (safe asset)	PUBY	LIQUID	+
	PUBY	BANK	+
	PUBY	PRIVATE	?
(2) But its own liquidity effect aside, government bank borrowing harms financial depth	PUBLIC	LIQUID	–
	PUBLIC	BANK	–
	PUBLIC	PRIVATE	–

Source: Author.

The three financial depth indicators are—as expected—highly correlated in levels (Table 3). Also that the correlation is weaker for the changes is natural, given the different role of the three indicators in the stages of financial development: as the banking sector develops, the share of liquid liabilities will decline relative to other funds, such as long-term deposits. That the LIQUID–BANK is stronger than the LIQUID–PRIVATE correlation points to the fact that public sector credit tends to suck away a part of any rise in BANK due to a rise in LIQUID. The correlation of public sector credit with the levels and changes of the three financial depth indicators (Table 3 and Figure 2) is in all but one case positive for PUBY, but in all but one case negative for PUBLIC, consistent with the two hypotheses in Table 2.

Table 3. Correlation Matrix for PUBLIC and Financial Depths Indicators

(73 Middle-Income Countries)

	PUBY	PUBLIC	LIQUID	BANK	PRIVATE
Level (2001–03 average)					
PUBY	1.00	0.66	0.50	0.48	0.18
PUBLIC	0.66	1.00	0.00	-0.10	-0.34
LIQUID	0.50	0.00	1.00	0.86	0.74
BANK	0.48	-0.10	0.86	1.00	0.93
PRIVATE	0.18	-0.34	0.74	0.93	1.00
Change (from 1980–82 average to 2001–03 average)					
PUBY	1.00	0.66	-0.12	0.10	0.30
PUBLIC	0.66	1.00	-0.24	-0.18	-0.31
LIQUID	-0.12	-0.24	1.00	0.69	0.41
BANK	0.10	-0.18	0.69	1.00	0.54
PRIVATE	0.30	-0.31	0.41	0.54	1.00

Sources: IFS and author's calculations.

Figure 2. Public Sector Bank Borrowing and Financial Depth, 73 Middle-Income Countries
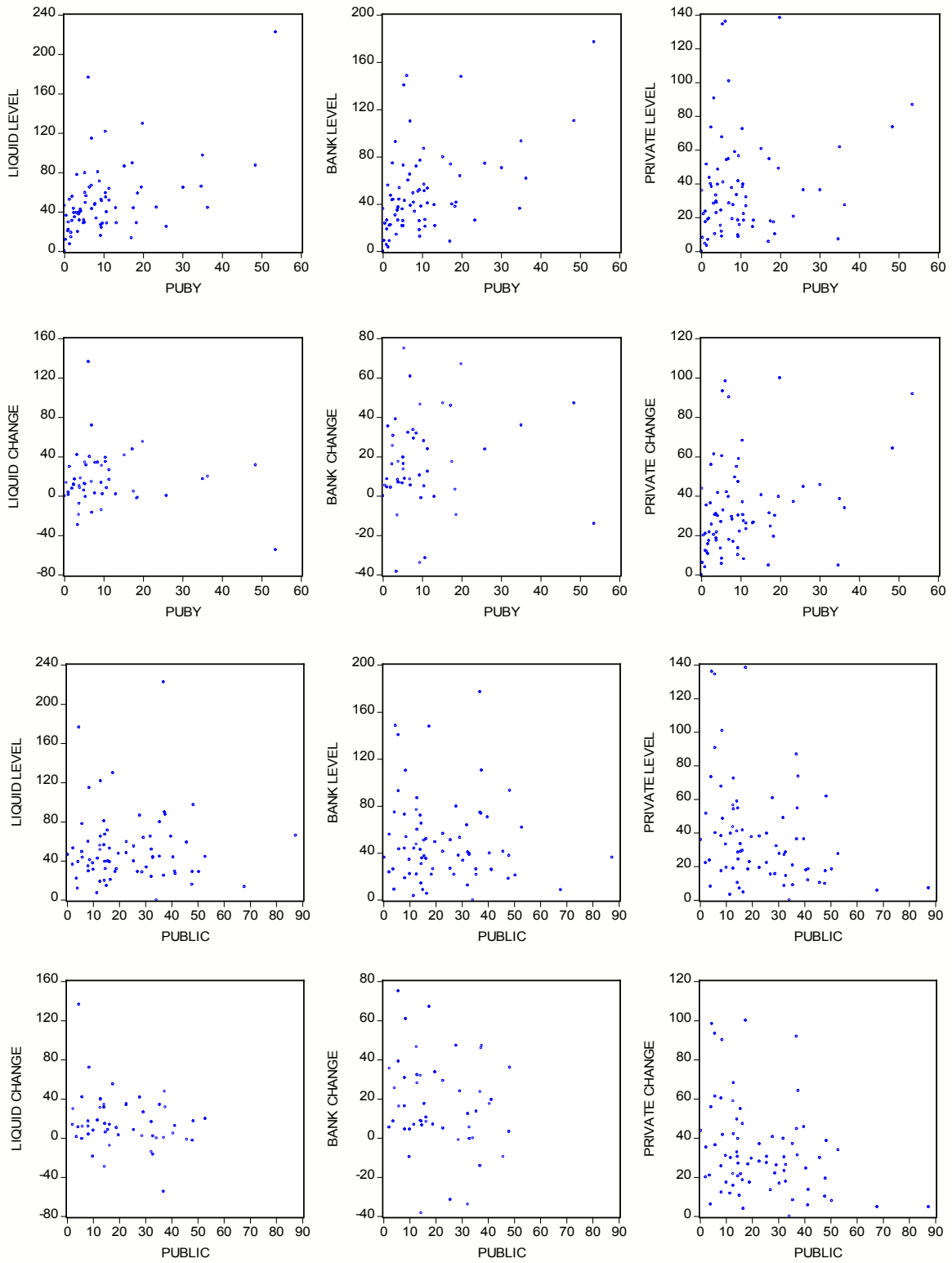
Sources: IFS and author's calculations.
Note: See Appendix Table A2 for definitions of PUBLIC, LIQUID, BANK, and PRIVATE. "Level" refers to the 2001–03 average of a variable, and "change" to the difference between the 1980–82 and 2001–03 averages.

Results

To examine the first hypothesis, Table 4 reports the results of the PUBY regressions. The upper panel shows the results of univariate regressions for the level (2001–03 average) and change (from 1980–82 average to 2001–03 average) of LIQUID and BANK on PUBLIC; the lower panel shows the corresponding results of the multivariate regressions. To account for potential nonlinearity, separate results are reported for two subsamples of countries, those with a high (above median) and those with a low (below median) value of PUBLIC.

The results provide evidence of the expected positive contribution of PUBY to financial depth. Its coefficients on LIQUID and BANK are highly significant and positive, both in the univariate and the multivariate regressions. Their size of about 1.3–1.5 suggest that an increase in the long-run average of PUBY has a more than proportional effect on LIQUID and BANK. That the coefficient on LIQUID is larger than the one on BANK is consistent with the fact that an increase in PUBY is likely to concurrently reduce private sector credit.

To examine the second hypothesis, Table 5 reports the results of the PUBLIC regressions. The results provide evidence of the expected negative effect of PUBLIC on PRIVATE, but not on LIQUID and BANK. That the regressions do not confirm the expected negative impact of an increase in PUBLIC on LIQUID and BANK could be due to the relationship being blurred by an increase in LIQUID in response to an increase in public borrowing: consumers could save more because they are somewhat Ricardian; or because they assume (as argued here) that banks that lend mostly to the government tend to be more profitable and thus safer. And if LIQUID rises, BANK tends to rise as well, as Table 3 has shown.

The regression coefficients imply that this negative impact is economically significant and is larger for countries with very high public sector credit. They predict that a 1 percentage point increase in the 1980–2003 average share of public sector credit in total credit reduces the 2001–03 average level of the ratio of private sector credit to GDP by about 0.5 percentage points for all countries and by about 0.6 percentage points for the high-PUBLIC countries. Moreover, they predict that a 1 percentage point increase in the 1980–2003 average share of public sector credit in total credit reduces the 1980–83 versus 2001–03 growth in the ratio of private sector credit to GDP by about 0.3 percentage points for all countries and by about 0.5 percentage points for the high-PUBLIC countries.

The results suggest that there is something like an optimal level of public sector bank borrowing with regard to financial development: some of it helps, but too much of it hurts. The positive effect of PUBY on LIQUID, BANK, and PRIVATE is larger for the "Low PUBLIC" group than for the "High PUBLIC" group. Also, the negative effect of PUBLIC on PRIVATE is statistically significant for the "All" and "High PUBLIC," but not for the "Low PUBLIC" group; and the coefficient on PUBLIC is larger for the "High PUBLIC" group than for the "All" group. All these observations hold both for the level and the change regressions.

We have found that too much public sector borrowing can harm financial deepening in the long run. Next, we examine whether public sector borrowing affects the quality of financial development, specifically bank profitability and efficiency, as hypothesized in Section III.

Table 4. Regression Results—Independent Variable PUBY

	LIQUID			BANK			PRIVATE		
	All	High PUBLIC	Low PUBLIC	All	High PUBLIC	Low PUBLIC	All	High PUBLIC	Low PUBLIC
Level (2001–03 average)									
PUBY	**1.64*****	**2.07*****	**7.10*****	**1.57*****	**2.16*****	**6.92*****	**0.51***	**1.09*****	**5.38*****
	0.59	*0.74*	*1.62*	*0.40*	*0.42*	*1.42*	*0.29*	*0.24*	*1.43*
Number of countries	73	37	36	73	37	36	73	37	36
R-squared	0.25	0.42	0.38	0.23	0.52	0.33	0.03	0.25	0.23
Change (from 1980–82 average to 2001–03 average)									
PUBY	**-0.30**	**-0.32**	**4.05*****	**0.22**	**0.36**	**2.62****	**0.64*****	**1.10*****	**5.30*****
	0.46	*0.55*	*1.42*	*0.38*	*0.48*	*1.13*	*0.25*	*0.25*	*0.94*
Number of countries	51	25	26	49	24	25	73	37	36
R-squared	0.01	0.04	0.13	0.01	0.04	0.11	0.09	0.40	0.40
Level (2001–03 average)									
PUBY	**1.47*****	**1.83***	**7.41*****	**1.25*****	**1.85*****	**5.98*****	**0.32**	**0.77****	**4.55****
	0.44	*1.07*	*1.97*	*0.28*	*0.66*	*1.82*	*0.35*	*0.38*	*1.82*
INCOME	14.17***	10.70	6.72**	15.02***	9.71	9.21***	14.92***	9.82*	9.31***
	2.75	*8.51*	*2.66*	*2.50*	*6.39*	*2.77*	*2.40*	*5.49*	*2.83*
INFLATION	-14.59***	-12.19	-1.82	-16.25***	-11.90	-3.00	-16.19***	-12.59	-3.15
	5.06	*12.77*	*7.03*	*4.46*	*10.45*	*7.14*	*4.43*	*9.61*	*7.05*
MARGIN	0.04***	0.03	-0.20	0.03***	0.02	-0.48	0.03**	0.03	-0.48
	0.01	*0.03*	*0.41*	*0.01*	*0.02*	*0.42*	*0.01*	*0.02*	*0.41*
Number of countries	66	33	33	66	33	33	66	33	33
R-squared	0.41	0.42	0.40	0.40	0.54	0.35	0.19	0.31	0.27
Change (from 1980–82 average to 2001–03 average)									
PUBY	**-0.18**	**-0.45**	**4.97*****	**0.24**	**0.22**	**2.69***	**0.62****	**1.14*****	**4.93*****
	0.41	*-0.94*	*2.82*	*0.35*	*0.41*	*1.36*	*0.30*	*0.33*	*1.11*
INCOME	71.94	42.30**	86.36**	38.37	71.84***	19.86	18.83	53.78**	18.14
	36.69	*2.23*	*1.99*	*23.67*	*22.92*	*33.42*	*18.23*	*24.64*	*18.23*
INFLATION	-16.44	-23.70***	-1.69	-11.35*	-13.97*	-3.46	-12.77***	-2.98	-3.29
	6.73	*-2.70*	*-0.13*	*5.90*	*7.96*	*14.86*	*3.35*	*4.68*	*5.55*
MARGIN	0.05	0.06***	0.00	-0.02	0.00	-0.22	0.03***	0.03	-0.30
	0.02	*2.72*	*0.00*	*0.02*	*0.02*	*0.74*	*0.01*	*0.01*	*0.25*
Number of countries	45	23	22	43	22	21	66	33	33
R-squared	0.38	0.46	0.50	0.30	0.57	0.15	0.30	0.52	0.48

Source: Author's calculations.
Notes: White-heteroskedasticity-consistent standard errors are reported in italics. Significance levels are *** 1 percent, ** 5 percent, and * 10 percent.

Table 5. Regression Results—Independent Variable PUBLIC

	LIQUID			BANK			PRIVATE		
	All	High PUBLIC	Low PUBLIC	All	High PUBLIC	Low PUBLIC	All	High PUBLIC	Low PUBLIC
Level (2001–03 average)									
PUBLIC	**-0.01**	**-0.19**	**-0.65**	**-0.22**	**-0.36**	**-1.76**	**-0.61*****	**-0.59***	**-2.14**
	0.24	*0.36*	*1.19*	*0.23*	*0.35*	*1.28*	*0.18*	*0.30*	*1.19*
Number of countries	73	37	36	73	37	36	73	37	36
R-squared	0.00	0.00	0.01	0.01	0.02	0.06	0.11	0.09	0.10
Change (from 1980–82 average to 2001–03 average)									
PUBLIC	**-0.47**	**-0.61**	**-1.56**	**-0.32**	**-0.38**	**-1.45**	**-0.42*****	**-0.49****	**-1.23**
	0.29	*0.41*	*1.41*	*0.24*	*0.61*	*0.91*	*0.14*	*0.20*	*0.84*
Number of countries	51	25	26	49	24	25	73	37	36
R-squared	0.06	0.06	0.05	0.03	0.02	0.08	0.10	0.10	0.06
Level (2001–03 average)									
PUBLIC	**0.17**	**-0.07**	**-0.29**	**-0.04**	**-0.35**	**-1.66**	**-0.47*****	**-0.56****	**-2.04**
	0.23	*0.25*	*1.14*	*0.21*	*0.24*	*1.18*	*0.17*	*0.25*	*1.11*
INCOME	18.83***	24.24***	18.14***	19.77***	25.80***	21.71***	17.90***	20.23***	20.62***
	2.57	*4.07*	*4.35*	*2.63*	*4.84*	*4.61*	*2.43*	*5.36*	*4.35*
INFLATION	-17.12***	-23.38***	-10.94	-17.30***	-22.56***	-9.10	-13.81***	-16.15***	-7.12
	4.60	*7.88*	*7.30*	*4.78*	*8.28*	*8.25*	*4.04*	*7.44*	*7.60*
MARGIN	0.03***	0.04*	-0.21	0.02	0.02	-0.42	0.02***	0.03*	-0.41
	0.01	*0.02*	*0.55*	*0.01*	*0.02*	*0.68*	*0.01*	*0.02*	*0.61*
Number of countries	66	33	33	66	33	33	66	33	33
R-squared	0.11	0.14	0.11	0.17	0.23	0.22	0.25	0.30	0.23
Change (from 1980–82 average to 2001–03 average)									
PUBLIC	**-0.15**	**-0.59***	**-1.06**	**-0.06**	**-0.41**	**-1.73**	**-0.27*****	**-0.51*****	**-0.90**
	0.23	*0.34*	*0.96*	*0.27*	*0.40*	*1.06*	*0.12*	*0.14*	*0.74*
INCOME	71.40*	39.40*	80.54	35.33	57.07**	9.97	5.51	8.79	1.71
	35.64	*19.57*	*50.46*	*24.78*	*25.88*	*36.66*	*17.76*	*22.23*	*20.92*
INFLATION	-15.83***	-22.82***	-15.17	-10.94*	-15.51*	-12.22	-13.21***	-12.38**	-11.81**
	6.70	*7.19*	*11.07*	*6.28*	*8.27*	*11.00*	*3.37*	*5.33*	*5.60*
MARGIN	0.05***	0.05**	0.53	-0.02	-0.01	0.18	0.02***	0.02	-0.30
	0.02	*0.02*	*0.44*	*0.02*	*0.02*	*0.56*	*0.01*	*0.01*	*0.38*
Number of countries	45	21	24	43	20	23	66	33	33
R-squared	0.38	0.47	0.38	0.28	0.60	0.20	0.25	0.27	0.27

Source: Author's calculations.
Notes: White-heteroskedasticity-consistent standard errors are reported in italics. Significance levels are *** 1 percent, ** 5 percent, and * 10 percent.

V.   DOES PUBLIC SECTOR CREDIT AFFECT THE QUALITY OF FINANCIAL DEVELOPMENT?

This section examines the empirical impact of large government borrowing from the domestic banking sector on the quality of financial development. The findings suggest that banks that are mainly invested in government debt tend to be more profitable and less efficient than others, as hypothesized in Section III.

Approach

The impact of the share of government credit in total bank credit on profitability and efficiency is examined by including the share of public sector credit in total credit in the bank's home market[10] (PUBLIC) in standard models of profitability, as measured by a bank's return on assets (PROFIT), and (productive) efficiency, as measured by its cost-income ratio (EFFICIENCY). Specifically, two equations are estimated, where i stands for a given bank:

$$PROFIT_i = \alpha + \beta_1 PUBLIC_i + \beta_2 MARGIN_i + \beta_3 CAPITAL_i +$$
$$+ \beta_4 LIQUIDITY_i + \beta_5 OBS_i + \beta_6 SIZE_i + \beta_7 EFFICIENCY_i + \varepsilon_i,$$

(5)

and

$$EFFICIENCY_i = \alpha + \beta_1 PUBLIC_i + \beta_2 MARGIN_i + \beta_3 CAPITAL_i +$$
$$+ \beta_4 LIQUIDITY_i + \beta_5 OBS_i + \beta_6 SIZE_i + \varepsilon_i.$$

(6)

A number of control variables that have been found to be related to bank profitability and efficiency in the literature[11] are included (expected signs of the relationship to PROFIT and EFFICIENCY, respectively, appear in parentheses): (i) the net interest MARGIN (PROFIT+/EFFICIENCY−), a proxy for the degree of competition a bank is facing, where higher margins imply lower competition; (ii) CAPITAL (PROFIT+/EFFICIENCY−), for a bank's capitalization, because banks with a higher capital/assets ratio would need to earn a higher return on assets and need to be more efficient to reach a given required return on capital; (iii) LIQUIDITY (PROFIT−/EFFICIENCY+), for a bank's liquidity, because more liquid assets would be expected to earn a lower return, but require less in inputs than loans and thus have a lower cost-income ratio; (iv) OBS (PROFIT+/EFFICIENCY−), for the importance of the bank's off-balance-sheet activities, which usually generate additional profits outside the on-balance sheet lending, but tend to imply higher administrative costs and thus have a higher cost-income ratio; (v) SIZE (PROFIT?/EFFICIENCY+), for the bank's size relative to its competitors in the home market, because profitability could vary by bank size (e.g., many of the large banks in developing countries are owned by the usually less profit-maximizing government), and because efficiency could be increasing with bank size if

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[10] Data on public sector lending at the individual bank level are available only for a few developing countries.

[11] See, for example, Goddard and others (2004), and Demirgüç-Kunt and others (2004).

there are economies of scale; and (vi) EFFICIENCY (PROFIT+), for the bank's productive efficiency, because more efficient banks should be more profitable.

PROFIT and EFFICIENCY are obviously intimately related because PROFIT is essentially income minus costs over assets, and EFFICIENCY is cost over assets. Using the same explanatory variables in both regressions and including EFFICIENCY in the PROFIT regression thus makes it possible to distinguish between the income- and cost-related effects on profitability: while the EFFICIENCY regression explains the cost-related effects, the PROFIT regression includes both, with the difference being accounted for by income.

See Appendix Table A3 for a more detailed description of the variables, their sources, and descriptive statistics, and Appendix Tables A5 for their correlations. OLS are used to estimate the model for 4,075 bank-year observations over 2001–03.[12]

Results

There is empirical evidence that developing country banks mainly invested in government debt are more profitable but less efficient than others (Table 6).

Table 6. Regression Results: Public Sector Credit and Bank Profitability

Independent Variable	PROFIT	PROFIT	EFFICIENCY	EFFICIENCY
CONSTANT	1.325***	0.357***	−5.160***	−0.785***
	0.043	0.057	0.098	0.094
PUBLIC	**0.002**	**0.004***	**−0.011***	**−0.006***
	0.001	**0.001**	**0.003**	**0.002**
MARGIN		0.466***		−0.560***
		0.014		0.011
CAPITAL		0.017***		0.019***
		0.002		0.004
LIQUIDITY		−0.002**		0.011***
		0.001		0.002
OBS		0.514***		−0.826***
		0.020		0.017
SIZE		0.098***		0.155***
		0.014		0.025
		0.595***		
EFFICIENCY		0.018		
Observations	4,075	4,075	4,075	4,075
R-squared	0.00	0.58	0.00	0.76

Source: Author's calculations.
Notes: A constant was included in all regressions. Heteroskedasticity-consistent standard errors are reported in italics. Significance levels are *** 1 percent, ** 5 percent, and * 10 percent.

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[12] From originally more than 6,300 bank-years, we exclude all observations for which the value of at least one of the variables (except PUBLIC) is below the 5th or above the 95th percentile. This procedure also removes incomplete observations. Estimating an efficiency frontier would be preferable, but is impossible here given that a separate frontier for each country is required, for which the number of banks is too small in most countries.

Regarding PROFIT, the coefficient on PUBLIC is positive and significant at the 1 percent level in the multivariate specification in the second column. The economic effect predicted by the coefficient is small, however, with an increase in the share of public sector credit in total bank credit by 10 percentage point predicted to imply an increase in the return on assets by 4 basis points.

Regarding EFFICIENCY, the coefficient of PUBLIC is negative and significant at the 1 percent level in both the univariate and the multivariate specification, although the economic effect predicted by the coefficient is again small, with an increase in the share of public sector credit in total bank credit by 10 percentage points expected to increase the overhead/assets ratio (i.e., a decrease in efficiency) by 6 basis points.

In sum, the empirical evidence confirms a negative impact of large government borrowing from the domestic banking sector on the quality of financial development with regard to the structural characteristics of the banking sector, as hypothesized in Section III.

VI. Concluding Remarks—Implications for Fiscal Policy

This paper has argued that large government borrowing from the banking sector is likely to harm the depth and quality of financial development and provided evidence of such effects. This impact should by itself give pause to policymakers, given the link between financial development and economic growth and the increasing awareness that underdeveloped financial sectors can force financial openness upon an economy (Aizenman and Noy, 2003), raising the susceptibility to capital account crises (Caballero and Krishnamurthy, 2004).

In addition, low financial development can also have a negative boomerang effect on the conduct of fiscal policy itself. First, it can make the financing of the fiscal deficit more difficult as it is likely to increase the importance of crowding out and the macro implications of public sector asset-liability management (Montiel, 2003). Second, through its amplifying effect on macro volatility (Cecchetti and Krause, 2001), it can obstruct fiscal stabilization and contribute to the procyclicality of fiscal policy often observed in developing countries. Third, through its impact on growth, it can generally restrict fiscal policy by limiting the room for new expenditures and the debt level an economy is able to sustain.

These points reinforce the policy message of this paper: there are additional costs of fiscal prolificacy in developing countries arising from their implications for financial development. These costs must be taken into account in weighing the pros and cons of domestic versus external deficit financing and in assessing the costs and benefits of fiscal deficits in the first place. Financial liberalization and improvements to the institutional environment for financial development are unlikely to be sufficient to improve credit access for the private sector in many developing countries, as long as governments absorb a large part of credit.

Table A1. Countries Included in the Study

Country	Banking Sector Credit to the Public Sector, 2001–03 Average Ratio to … in Percent 1/		Number of Banks in Sample
	In Total Bank Credit	In GDP	
Albania	80.2	29.0	12
Algeria	75.5	30.9	12
Angola	15.3	0.9	9
Argentina	57.1	22.3	103
Armenia	20.6	1.8	13
Azerbaijan	32.5	2.7	14
Bahrain	18.1	13.0	29
Belarus	47.5	8.6	20
Bolivia	7.6	4.2	13
Bosnia and Herzegovina	0.5	0.2	28
Botswana	7.1	1.3	9
Brazil	51.1	38.1	192
Bulgaria	21.7	5.6	28
Chile	1.5	1.1	37
China	8.4	12.4	70
Colombia	32.0	11.4	40
Costa Rica	16.1	5.7	60
Croatia	23.2	14.7	42
Czech Republic	34.2	17.3	33
Dominican Republic	9.9	4.4	54
Ecuador	9.9	2.6	38
Egypt	33.7	31.4	44
El Salvador	7.8	3.4	16
Equatorial Guinea	5.7	0.2	0
Estonia	7.1	2.2	9
Georgia	10.1	0.9	9
Ghana	54.3	14.1	24
Guatemala	12.8	2.9	35
Honduras	4.4	1.9	27
Hungary	24.0	11.8	36
India	39.6	21.1	97
Indonesia	53.3	22.0	64
Iran, I.R. of	3.6	1.3	15
Jamaica	63.3	24.8	16
Jordan	16.5	14.4	19
Kazakhstan	14.2	3.1	29
Kuwait	33.4	36.8	26
Latvia	18.7	6.2	22
Lebanon	50.9	90.3	59
Libya	55.4	22.1	0
Lithuania	30.3	6.3	10
Macedonia, FYR	15.7	3.4	17

Table A1. Countries Included in the Study (continued)

Country	Banking Sector Credit to the Public Sector, 2001–03 Average Ratio to … in Percent 1/		Number of Banks in Sample
	In Total Bank Credit	In GDP	
Malaysia	6.4	9.4	75
Mauritius	23.7	19.0	15
Mexico	54.3	20.5	134
Morocco	25.8	19.0	17
Namibia	9.5	5.1	8
Nicaragua	16.6	4.5	14
Oman	12.9	5.7	11
Pakistan	33.4	13.7	43
Panama	2.3	2.1	92
Paraguay	7.1	1.6	20
Peru	13.4	3.5	22
Philippines	32.8	18.5	50
Poland	26.2	10.1	46
Qatar	55.6	34.4	10
Romania	32.2	4.0	30
Russia	28.5	7.3	219
Saudi Arabia	26.4	20.2	18
Slovak Republic	47.8	34.2	22
Slovenia	22.3	11.3	21
South Africa	4.4	6.2	55
Sri Lanka	22.7	8.5	16
Syrian Arab Republic	58.4	12.6	2
Thailand	8.4	9.3	46
Trinidad and Tobago	20.0	10.4	12
Tunisia	7.1	5.2	32
Turkey	64.7	39.5	53
Ukraine	13.0	2.7	50
United Arab Emirates	9.7	5.8	28
Uruguay	16.0	10.5	42
Venezuela, Rep. Bol.	27.8	3.9	71
Vietnam	7.5	3.7	27
Mean	25.5	12.3	36.9

Sources: Bankscope, IFS, WEO, and author.
1/ Credit to the public sector...IFS lines 22a–c and 42a–c; total credit...IFS lines 22+42.

Table A2. Country Characteristics and Financial Depth—Variable Description and Sources

Variable	Description and Source	Mean St. Dev. 1/
Share of credit to public sector in total (PUBLIC)	Credit to the public sector (IFS lines 22a–c and 42a–c) in percent of total credit (IFS lines 22+42)	23.4 16.7
Credit to public sector/GDP (PUBY)	Credit to the public sector (IFS lines 22a–c and 42a–c) in percent of GDP (WEO line NGDP)	10.7 11.3
Per capita income (INCOME)	Logarithm of gross national income per capita in US-dollars at purchasing power parities (WEO line PPPPC)	3.8 (0.3) 0.3 (0.2)
Per capita growth	Annual percent change in per capita income, 1994–2003 mean	4.0 2.4
Public external debt	Public external debt/GDP in percent, 2001–03 mean (WEO line D)	33.5 24.5
Fiscal deficit	General government primary balance, 1994–03 mean (WEO line GGBXI)	0.1 3.0
Overall government intervention	Index from 1 to 5, where higher values imply more intervention, 2003 (Heritage Foundation, 2005)	3.0 0.9
Trade restrictions	Index from 1 to 5, where higher values imply more restrictions, 2003 (Heritage Foundation, 2005)	3.5 1.1
Share of public sector in output	Value-added of state-owned enterprises in percent of GDP, average of 1978–1991 (World Bank, 1995)	1.1 3.8
Government ownership in banks	Share of the assets of the top 10 banks in a given country owned by the government of that country, 1995 (La Porta and others, 2002)	0.5 0.3
Banking sector freedom	Index from –5 to –1, where higher values imply less freedom, 2003 (Heritage Foundation, 2005)	–2.9 –1.0
Cost of enforcement	Cost of enforcing a contract in percent of debt, 2005 (World Bank, 2005)	24.3 19.1
Credit information	Index from 0 to 6, where higher values imply better credit information, 2005 (World Bank, 2005)	2.9 2.0
Deposit insurance	Number of years of existence of deposit insurance (Demirgüç-Kunt and Sobaci, 2001)	6.8 10.8
Banking crises	Number of years from 1970 to 2002 during which the banking sector was in a systemic crisis, with small or borderline crises counted as half a year (Caprio and Klingebiel, 2003)	5.1 4.2
Africa/Europe/Middle East/South America	Dummy = 1 for countries in the respective region	…
English/French/Socialist legal origin	Dummy = 1 if this legal origin applies (La Porta and others, 2002)	…
Banking sector liquid liabilities (LIQUID)	Currency plus demand deposits and interest-bearing liabilities of banks (deposit money banks and other banking institutions) (IFS line 55l or IFS lines 34+35) in percent of GDP (WEO line NGDP)	51.6 (16.6) 36.0 (27.8)
Banking sector total credit (BANK)	Total credit from banks (deposit money banks and other banking institutions) (IFS lines 22+42) in percent of GDP (WEO line NGDP)	49.3 (16.9) 35.3 (23.6)
Banking sector credit to the private sector (PRIVATE)	Credit to the private sector from banks (deposit money banks and other banking institutions) (IFS lines 22d+42d) in percent of GDP (WEO line NGDP)	37.4 (33.2) 30.1 (22.9)
Average inflation rate (INFLATION)	Consumer price inflation rate in percent, average over 1960–2004 (WEO line PCPI)	1.4 0.8
Average interest margin (MARGIN)	Spread between average short-term domestic currency lending and average deposit rates (IFS lines 60p and 60l)	29.1 107.8

Sources: IFS, WEO, and author.

1/ Values for series for change regressions of financial depth in parentheses if different from level regressions.

Table A3. Profitability and Efficiency—Variable Description and Sources

Variable	Description and Source	Mean St. Dev.
PROFIT	Return on average assets (Bankscope)	1.38 1.57
EFFICIENCY	Non-interest expense in percent of average assets, multiplied by (–1) (Bankscope)	–7.42 12.06
PUBLIC	Credit to the public sector (IFS lines 22a–c and 42a–c) in percent of total credit (IFS lines 22+42)	27.41 18.45
MARGIN	Net interest margin (interest income minus interest expense over interest-bearing assets) (Bankscope)	5.51 3.61
CAPITAL	Equity in percent of total assets (Bankscope)	16.74 40.75
LIQUIDITY	Liquid assets in percent of total assets (Bankscope)	32.66 25.30
OBS	Other operating income in percent of total assets (Bankscope)	2.67 2.37
SIZE	Ratio of total assets to average total assets in the sector (Bankscope)	0.70 0.92

Sources: Bankscope, IFS, and author.

Table A4. Correlation Matrix for Financial Depth Regressions

	PUBY	PUBLIC	INCOME (level)	INCOME (change)	INFLATION	MARGIN
PUBY	1.00	0.66	0.20	-0.20	-0.03	-0.01
PUBLIC	0.66	1.00	0.01	-0.25	0.20	0.03
INCOME (level)	0.20	0.01	1.00	0.01	-0.31	-0.19
INCOME (change)	-0.20	-0.25	0.01	1.00	-0.29	-0.18
INFLATION	-0.03	0.20	-0.31	-0.29	1.00	0.42
MARGIN	-0.01	0.03	-0.19	-0.18	0.42	1.00

Source: Author's calculations.

Table A5. Correlation Matrix for Profitability and Efficiency Regressions

	PROFIT	PUBLIC	MARGIN	CAPITAL	LIQUIDITY	OBS	SIZE	EFFICIENCY
PROFIT	1.00	0.02	0.34	0.23	-0.01	0.13	0.02	0.07
PUBLIC	0.02	1.00	0.04	-0.04	0.34	0.04	-0.07	-0.06
MARGIN	0.34	0.04	1.00	0.26	-0.14	0.21	-0.13	-0.69
CAPITAL	0.23	-0.04	0.26	1.00	-0.12	0.18	-0.27	-0.21
LIQUIDITY	-0.01	0.34	-0.14	-0.12	1.00	0.09	0.02	0.08
OBS	0.13	0.04	0.21	0.18	0.09	1.00	-0.05	-0.66
SIZE	0.02	-0.07	-0.13	-0.27	0.02	-0.05	1.00	0.12
EFFICIENCY	0.07	-0.06	-0.69	-0.21	0.08	-0.66	0.12	1.00

Source: Author's calculations.

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