Too Much Finance?

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Comments welcome

Abstract

This paper examines whether there is a threshold above which …nancial development no longer has a positive e¤ect on economic growth. We use di¤erent empirical approaches to show that there can indeed be "too much" …nance. In particular, our results suggest that …nance starts having a negative e¤ect on output growth when credit to the private sector reaches 100% of GDP. We show that our results are consistent with the "vanishing e¤ect" of …nancial development and that are not driven by output volatility, banking crises, low institutional quality, or by di¤erences in bank regulation and supervision.

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> ..we are throwing more and more of our resources, including the cream of our youth, into …nancial activities remote from the production of goods and services, into activities that generate high private rewards disproportionate to their social productivity.

James Tobin (1984)

1 Introduction

Although there is by now a large literature showing that finance plays a positive role in

probably due to the fact that they set their threshold for the "high region" at a level of financial depth which is much lower than the level for which we start finding that finance has a negative effect on growth.[7]

ways, which we describe below.

As in most of the literature that looks at the relationship between …nance and growth, we quantify …nancial depth by using credit to the private sector. The use of this variable is usually justi…ed with the argument that a …nancial system that lends to private …rms is more likely to stimulate growth through its risk evaluation and corporate control capacities than a …nancial system that only provides credit to the government or state-owned enterprises (King and Levine, 1993). There are many reasons why this variable, which only captures quantities, is an imperfect measure of …nancial development (for a discussion, see Levine,

2.1 Cross-Sectional Regressions

sector and economic growth. Given a model of the type $y = aPC + bPC^2 + ZC + u$, Lind and Mehlum (2011) show that in order to check for the presence of an inverted U relationship it is necessary to formulate the following joint null hypothesis:

$$H_0 : (a + b2PC_{min} \leq 0) \cup (a + 2bPC_{max} \geq 0): \quad (1)$$

against the alternative:

$$H_1 : (a + b2PC_{min} > 0) \cap (a + 2bPC_{max} < 0): \quad (2)$$

Where PC_{min} and PC_{max} are the minimum and maximum values of credit to the private sector. The test described in (1) and (2) is non-trivial because of the presence of inequality constraints. Lind and Mehlum (2011) use Sasabuchi's (1980) likelihood ratio test to build a test for the joint hypotheses of Equations (1) and (2).

The first column of Table 3 reports the results of the Sasabuchi-Lind-Mehlum (SLM) test based on the results of column 2 of Table 1. The top panel of the table shows that the marginal effect of credit to the private sector is positive and statistically significant at PC_{min} and negative and statistically significant at PC_{max} (we already saw this in Figure 1). The bottom panel of the table shows that the SLM test rejects H_0 and thus indicates that our results are consistent with the presence of an inverted U relationship between credit to the private sector and economic growth. The last row of Table 3 reports a 90% Fieller interval and shows that the relationship between credit to the private sector and economic growth is not statistically significant when PC ranges between 65% and 124% of GDP. The second and third columns of Table 3 shows that the SLM test yields even stronger results when we use regressions based on more recent data.

2.1.1 Semi-parametric estimations

panel of Figure 2 shows that GDP growth reaches a maximum when credit to the private sector is at 92% of GDP. This threshold is slightly higher but similar to the one obtained with the quadratic model. The figure also shows that the quadratic fit (the solid light line) obtained from Table 1 is a good approximation of the semi-parametric fit. The solid black line in the right panel of Figure 2 shows the results of the semi-parametric estimation of a model which includes the same controls used in column 6 of Table 1. Again, we find that the relationship between PC and GDP growth is concave and non-monotone and that the level of financial depth that maximizes GDP growth is slightly lower than what we found with the simple quadratic model of Table 1 (78% percent of GDP instead of 88% of GDP). Also in this case, the quadratic fit (the light solid line) appears to be a good approximation

the cross-sectional regressions of Table 1. Specifically, we augment the model of the last 4 columns of Table 4 with the square of credit to the private sector over GDP and check for the presence of a non-monotonic relationship between credit to the private sector and GDP growth. We find that both the linear and quadratic terms are always statistically significant. The point estimates of the regressions that use data for the period 1960-1995 and 1960-2000 (columns 1 and 2) suggest that the marginal effect of financial depth becomes negative when credit to the private sector reaches 140% of GDP (last row of Table 5). Including more recent data lowers this threshold to 100% (for the 1960-2005 period, column 3) and 90% (for the 1960-2010 period, column 4). Using more recent data also leads to more precise estimates of the quadratic term. This fact is consistent with the idea that recent data amplify and the downward bias of the miss-specified models of Table 4.

Figure 4 plots the marginal effect of credit to the private sector on economic growth. It shows that the positive effect of financial depth is no longer statistically significant when credit to the private sector reaches 42% of GDP (more than 30% of the observations in the regression of column 4 are above this threshold), it becomes negative when PC is at 90% of GDP (11% of of the observations in the regression of column 4 are above this threshold), and negative and statistically significant when financial depth reaches 113% of GDP (6% of exclude the United States, Iceland, Spain, and Ireland. We …nd that our results are robust to dropping these countries that have a large …nancial sector and were severely a¤ected by the recent …nancial crisis (Column 6; we explore the e¤ect of banking crises in the next section). Finally, we show that our results are robust to dropping the top and bottom 1% of the distribution of the dependent variable. (in particular, column 7 drops all observations for which average GDP growth over any given …ve year period is lower than -6% and greater than 9%).

The literature that uses panel data to study the relationship between …nancial depth and economic growth has traditionally focused on …ve-year growth spells. As Loayza and Rancière (2006) …nd that credit expansion may have a negative short-run and a positive long-run impact on growth, it would be interesting to check whether our …ndings are robust to using longer growth spells. In the cross-country estimations of Table 1, we already showed that our results hold when we use 30, 35, and 40-year growth spells. Since we have observations for the 1960-2010 period, we can also use panel data to study the relationship between …nancial depth and economic growth using ten-year growth episodes. We start with a linear speci…cation similar to that of Table 4 and …nd that credit to the private sector is signi…cantly correlated with economic growth when we use data for the period 1960-2000 (column 1 of Table 6). However, the vanishing e¤ect is also at work for the 10-year panel, and we …nd that the correlation between …nancial depth and growth is no longer statistically signi…cant when we use data for the period 1960-2010 (column 2 of Table 6; the speci…cation tests in the bottom panel of the table suggest that there may be problems with the non-monotone relationship between credit to the private sector and GDP growth which is signi…cant and have the opposite sign with respect to the main e¤ects. However, the point estimates of the interacted terms are smaller (in absolute value) than those of the main e¤ects. As $_{0} > 0$, $(_{0} + b_0) > 0$, $_{1} < 0$, and $(_{1} + b_1) < 0$, the relationship between private credit and GDP growth is concave in both low and high-volatility country-periods, but possibly not statistically signi…cant in the high-volatility subsample. The point estimates

We now follow Demetriades and Law (2006) who found that financial depth does not affect growth in countries with poor institutions and look at how institutional quality and bank regulation and supervision affect the relationship between financial depth and economic growth.

To measure institutional quality we use the ICRG index of the quality of government (for details see Table 10) to create a low quality of government dummy variable (LQOG) that takes a value of zero in country periods in which the ICRG index is above 0.5 (the median value of the index is 0.51) and a value of one in country-periods in which the index is equal or smaller than 0.5.

Column 1 of Table 8 shows that the low quality of government dummy is positively correlated with GDP growth (we expect a negative correlation) but its effect is not statistically significant (probably because this variable has limited within-country variance and therefore its effect tends to be captured by the country fixed effects). We also find that the main effect of PC and PC^2 show the now familiar quadratic relationship and that their point estimate suggest that the marginal effect of financial depth becomes negative when credit to the private sector reaches 70% of GDP. As in the regressions of Table 7, the coefficients of the interactive terms are statistically insignificant, smaller (in absolute value) than the main effects, and with the opposite sign with respect to the main effects. The point estimates suggest that in countries with poor institutions the marginal effect of credit to the private sector becomes negative at 60% of GDP.

Panel A of Figure 9 shows that when institutional quality is high financial depth has a positive and statistically significant effect on GDP growth when credit to the private sector is below 20% of GDP, the effect becomes negative at 70% of GDP and negative and statistically significant at 95% of GDP. Like Demetriades and Law (2006), we find that when institutional quality is low, credit to the private sector is never statistically significant.

Next, we use data from Barth et al. (2008) to build a set of time-invariant variables aimed at capturing cross-country differences in bank supervision and regulation (for details see Table 10). We start by using Barth et al.'s (2008) index of official bank supervision to build a time-invariant variable ($LOSI$) that takes a value of one in countries with weak official supervision of banks, a value of zero in countries with strong official supervision of statistically significant at 105% of GDP. In countries with weak official bank supervision the correlation between growth and credit to the private sector is never statistically significant. While Barth et al. (2008) find that official supervision does not have a positive effect on the performance and stability of the banking sector, we do find that official supervision affects the correlation between financial depth and economic growth.

As a second measure of bank regulation, we use Barth et al.'s (2008) capital regulatory index to build a time-invariant variable ($LKRI$) that takes a value of one in countries with low capital stringency and a value of zero in countries with high capital stringency. When we interact PC and PC^2 with $LKRI$ (column 3 of Table 8), we find results that are similar to those of column 2. The main effects and interacted effects are not statistically significant, but they still indicate a quadratic relationship. The point estimates indicate that the correlation between financial depth and economic growth becomes negative when $PC > 70\%$ of GDP in countries with strict capital requirements and when $PC > 139\%$ of GDP in countries with weak capital requirements. However, the correlation between financial depth and economic growth is never statistically significant in countries with low capital requirements (Panel C, Figure 9). In countries with strict capital requirements financial depth has a positive and statistically significant effect on GDP growth when credit to the private sector is below 25% of GDP, the effect becomes negative at 70% of GDP, and negative and statistically significant at 100% of GDP.

Finally, we look at the effect of private sector monitoring. In particular, we use the private monitoring index assembled by Barth et al. (2008) to build a variable ($LPMI$) that takes a value of one in countries with low private monitoring and a value of zero in countries with high private monitoring. According to Barth et al. (2008), this is the variable that has the strongest positive effect on bank performance and stability.

When we interact $LPMI$ with PC and PC^2 (Column 4 of Table 8), we find that the point estimates suggest that the marginal effect of financial depth becomes negative when credit to the private sector reaches 64% of GDP in countries with strong private monitoring of banks and when private credit reaches 77% of GDP in countries with weak private monitoring. We also find that the correlation between financial depth and economic growth is never statistically significant in countries with weak private monitoring (Panel D of Figure 9). However, we now find that, even though the coefficients of PC and PC^2 are statistically significant, the correlation between private credit and growth is never positive and statistically significant. The only statistically significant part of correlation plotted by the curve in the left graph of Panel D is when credit to the private sector is greater than 115% of GDP and the correlation between financial depth and economic growth is negative.

4 Industry-Level Data

An influential paper by Rajan and Zingales (1998) provides strong evidence of a causal relationship going from finance to growth by showing that industrial sectors that, for technological reasons, need more financial resources have a relative advantage in countries with large domestic financial markets. This approach provides a test of a specific mechanism through which financial depth matters (namely, by relaxing financing constraints) and has the advantage of addressing the reverse causality problem because it is plausible to assume that the growth of a specific industry will not affect financial depth in a country as a whole.

In this section, we use the Rajan and Zingales (1998) approach to examine whether industry-level data support our previous finding of a threshold above which finance starts having a negative effect on growth. As in the previous section, we follow the existing literature but allow for non-linearities in the relationship between financial and economic development. In particular, we estimate the following model:

$$VAGR = SHVA + EF \; (PC + PC^2) + \quad + \quad + " \; ; \qquad (5)$$

where $VAGR$ is real value-added growth in industry j in country i over the 1990-2000 period; $SHVA$ is the initial share of value-added of industry j over total industrial value-added in country i; EF is the Rajan and Zingales (1998) index of external financial dependence for industry j in the 1990s; PC is credit to the private sector in country i in the 1990s; and and are a set of industry and country fixed effects. Because of standard convergence arguments, we expect < 0. A concave relationship between financial depth and industry growth would instead be consistent with > 0 and < 0.

While Rajan and Zingales (1998) considered the 1980s, we focus on the 1990s. We choose a different period because, as argued earlier, financial systems grew substantially during the past two decades. In 1985 there were only three countries in which credit to the private sector was greater than 100% of GDP (Singapore, Switzerland, and Japan; at 99% of GDP, the US value was close to but below this threshold). By 1995 there were 14 countries in which credit to the private sector was larger than GDP.

We begin by setting $= 0$ and show that we can use our 1990s data to reproduce Rajan and Zingales's (1998) original result that industries that need more external financial resources have a relative advantage in countries with larger financial sectors (column 1 Table 9).[20] Next, we introduce the quadratic term and find that both interactive terms are statistically significant at the 5% level of confidence with > 0 and < 0 (column 2 of Table 9). The point estimates suggest that financial depth starts having a negative effect on relative industry-level growth when credit to the private sector reaches 120% of GDP.[21] This threshold is surprisingly close to what we found in the country-level panel regressions of Table 5.

In Columns 3 and 4, we check whether our results are driven by the correlation between financial depth and GDP per capita. We find that controlling for the interaction between external dependence and GDP per capita does not change our results (Column 3). The same holds if we augment our model with the interaction between external dependence and the square of GDP per capita (Column 4). In Column 5, we a use a robust regression routine to check whether our results are driven by outliers and find results which are essentially

Finally, we substitute the 1990s index of external dependence with Rajan and Zingales's (1998) original index for the 1980s. We do this to check whether our results are robust to some point, become smaller than the cost of instability brought about by the dark side.

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Table 1: Cross-Country OLS Regressions

This table reports the results of a set of cross-country OLS regressions in which average real per capita GDP growth over di¤erent time periods is regressed over the log of initial GDP per capita (LGDP), the log of total credit to the private sector over GDP (LPC), the level of credit to the private sector over GDP (PC), the square of the level of the level of credit to the private sector over GDP (PC^2), the log of average years of education (LEDU), the log of government consumption over GDP (LGC), the log of trade openness (LOPEN), and the log of in‡ation (LINF).

	(1)	(2)	(3)	(4)	(5)	(6)
LGDP(t-1)	-0.560***	-0.548***	-0.541***	-0.556***	-0.627***	-0.626***
	(0.210)	(0.205)	(0.194)	(0.182)	(0.193)	(0.185)
LPC	0.743**		0.646*		0.701**	
	(0.354)		(0.327)		(0.316)	
PC		5.815**		6.170***		5.759***
		(2.354)		(2.066)		(1.875)
PC2		-3.503**		-3.753***		-3.275***
		(1.538)		(1.312)		(1.130)
LEDU	1.447***	1.488***	1.421***	1.427***	1.321**	1.332**
	(0.444)	(0.427)	(0.465)	(0.431)	(0.538)	
LINF	-0.304**	-0.351***	-0.256*	-0.296**	-0.125	
	(0.129)	(0.124)	(0.131)	(0.127)	(0.144)	(0.143)
LOPEN	0.0457	-0.107	0.0252	-0.165	0.114	-0.0331
	(0.287)	(0.286)	(0.285)	(0.276)	(0.270)	(0.268)
LGC	-0.210	-0.490	-0.424	-0.806	-0.383	-0.796
	(0.568)	(0.557)	(0.538)	(0.510)	(0.515)	(0.521)
Cons.	5.650***	4.624**	5.953***	5.614***	5.928***	5.342***
	(2.064)	(1.810)	(2.002)	(1.752)	(1.886)	(1.711)
N. Obs.	66	66	66	66	63	63
R2	0.435	0.458	0.412	0.465	0.347	0.398
Period	1970-00		1970-05		1970-10	
dGR/dPC=0		0.83		0.82		0.88

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2: Cross-Country OLS Regressions

This table reports the results of a set of cross-country OLS regressions in which average real per capita GDP growth over di¤erent time periods is regressed over the log of initial GDP per capita ($LGDP$), the log of total credit to the private sector over GDP (LPC), the level of credit to the private sector over GDP (PC), the square of the level of the level of credit to the private sector over GDP (PC^2), the log of average years of education ($LEDU$), the log of government consumption over GDP (LGC), the log of trade openness ($LOPEN$), and the log of in‡ation ($LINF$).

	(1)	(2)	(3)	(4)
LGDP(t-1)	-0.780***	-0.806***	-0.306*	-0.327*
	(0.211)	(0.197)	(0.174)	(0.170)
LPC	0.759**		0.429	
	(0.303)		(0.259)	
PC		5.262***		3.924***
		(1.947)		(1.343)
PC2		-2.633**		-2.028***
		(1.137)		(0.673)
LEDU	2.010***	1.975***	1.043**	0.993**
	(0.517)	(0.539)	(0.423)	(0.422)
LINF	-0.244*	-0.239	0.185	0.206*
	(0.141)	(0.164)	(0.118)	(0.122)
LOPEN	-0.193	-0.233	0.261	0.186
	(0.330)	(0.345)	(0.260)	(0.253)
LGC	-0.782	-0.951*	-1.097**	-1.234***
	(0.494)	(0.531)	(0.423)	(0.438)
Cons.	8.269***	6.777***	4.272**	3.593**
	(2.338)	(1.985)	(1.920)	(1.675)
N. Obs.	86	86	97	97
R2	00.394	0.420	0.243	0.284
Period	1980-10		1990-10	
dGR/dPC=0		1.00		0.97

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3: Tests for U-shape

This table reports the results of the Sasabuchi-Lind-Mehlum test for inverse U-shaped relationship. The …rst two columns are based on the estimates of columns 2 and 6 of Table 1, the third column is based on the estimates of column 4 of Table 2, the fourth column is based on column 4 of Table 5, and the …fth column is based on the estimates of column 4 of Table 6.

	(1)	(2)	(3)	(4)	(5)
Slope at PC_{min}	5.50***	5.48***	3.79***	3.61**	7.20***
	(2.22)	(1.78)	(1.30)	(1.73)	(2.01)
Slope at PC_{max}	-4.33***	-3.19***	-2.61***	-7.27***	-16.63***
	(2.32)	(1.41)	(0.97)	(2.38)	(4.53)

Table 4: Panel Estimations

This table reports the results of a set of panel regressions aimed at estimating the e¤ect of credit to the private sector on economic growth. All regressions consist of 5-year non-overlapping growth spells and are estimated using System GMM with all available lags used as instrument. The set

Table 5: Panel Estimations

Table 6: Panel Estimations: 10-year Growth Episodes

This table reports the results of a set of panel regressions aimed at estimating the e¤ect of credit to the private sector on economic growth. All regressions consist of 10-year non-overlapping growth spells and are estimated using System GMM with all available lags used as instrument. The set of controls include time …xed e¤ects and the lags of: log initial GDP per capita (LGDP); the level of credit to the private sector (PC) and its square (PC^2); the log of average years of education (LEDU); the log of government consumption over GDP (LGC); the log of trade openness (LOPEN); and the log of in‡ation (LINF). The bottom panel of the table reports the standard system GMM speci…cation tests.

	(1)	(2)	(3)	(4)
LGDP(t-1)	-0.024	-0.323	-0.169	-0.333
	(0.477)	(0.405)	(0.474)	(0.344)
PC(t-1)	2.832*	0.540	6.965**	7.270***
	(1.653)	(0.991)	(2.821)	(2.016)
PC2(t-1)			-3.912**	-4.430***
			(1.663)	(1.181)
LEDU(t-1)	1.044	2.226**	1.217	1.571*
	(1.018)	(0.988)	(1.201)	(0.811)
LGC(t-1)	-2.375**	-3.159***	-1.398	-2.443**
	(1.119)	(1.087)	(1.094)	(1.026)
LOPEN(t-1)	0.504	1.295	-0.300	0.319
	(0.935)	(0.805)	(0.769)	(0.585)
LINF(t-1)	-0.163	-0.957**	-0.401	-0.582
	(0.368)	(0.400)	(0.384)	(0.365)
Cons.	2.303	4.034	3.947	5.644*
	(3.507)	(4.441)	(2.836)	(3.035)
N. Obs.	360	479	360	479
N. Cy.	127	133	127	133
AR1	-3.30	-3.11	-3.14	-3.50
p-value	0.00	0.00	0.00	0.00
AR2	1.17	-0.01	0.71	-1.02
p-value	0.244	0.991	0.476	0.306
OID	30.96	64.49	30.44	56.77
p-value	0.155	0.0561	0.342	0.446
Period	1960-00	1960-10	1960-00	1960-10
dGR/dPC=0			0.89	0.82

Robust (Windmeijer) standard errors in parentheses

*** p<0.01, ** p

Table 7: Volatility and Banking Crises

System GMM estimations of 5-year non-overlapping growth spells with all available lags used as instrument. The set of controls include lags of the level of credit to the private sector (PC) and its square (PC^2); a dummy variable that takes a value of one for high volatility periods (HVOL); a dummy variable that takes a value of one in country-periods with banking crises (BKCR); and the interaction between PC and PC^2 and each of HV HV[illegible]

Table 8: Institutional Quality and Bank Regulation and Supervision

This table reports system GMM estimations similar to those of Table 7 but with PC and PC^2 interacted with a dummy variable that takes a value of one in country-periods with low quality of government (LQOG) and a set of time-invariant variables that take a value of one in countries with low o¢ cial banking superS1a

Table 9: Rajan and Zingales Estimations

This table reports the results of a set of regressions in which the dependent variable is real industry-

Table 10: Data Description and Sources

Variable	Description and Sources
Growth	Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2000 U.S. dollars. Source: World Bank World Development Indicators (WDI) 2011.
PC	Claims on private sector by deposit money banks and other financial institutions divided by GDP. Source: Beck et al. (November 2010 update) and Beck et al. (2000) when Beck et al. (2010) has missing data (and are the log and the square of PC).
EDUC	Average years of schooling of males and females above 25 years of age (the regressions use the inverse hyperbolic sine transformation = ln(+ $\sqrt{\quad}$ + 1)). Source: Barro and Lee (2010)
GC	General government final consumption expenditure as a percentage of GDP (the regressions use the log of this variable). Source: WDI, 2011.
OPEN	Trade openness (calculated as exports plus imports divided by GDP) (the regressions use the log of this variable). Source: WDI 2011.
INFL	Inflation as measured by the consumer price index (annual %). We drop all observations for which inflation is less than -10% and then set to zero all the observations for which inflation takes on negative value and apply the inverse hyperbolic sine transformation (= ln(+ $\sqrt{\quad}$ + 1)). Source: WDI 2011.
HVOL	Dummy variable that takes a value of one in country-periods for which the standard deviation of annual GDP growth (measured in constant US dollars) is greater than 3.5 %. Source: own calculations based on WDI 2011.
BKCR	Dummy variable that takes a value of one if a given country-period there was at least on banking crisis. Source: Laeven and Valencia (2010).
LQOG	Dummy variable that takes a value of one if the continuous quality of government index is smaller than 0.5. Source: The quality of government database maintained by the QOG Institute of the University of Gothenburg (www.qog.pol.gu.se). We use the icrg-qog variable which is the mean value of the ICRG variables "Corruption", "Law and Order' and "Bureaucracy Quality", scaled 0-1. The data only go back to 1984. For early periods we set the LQOG variable to be equal to its 1984 value.
LOSI	Time-invariant variable that takes a value of 1 if the Barth et al. (2008) index of official bank supervision rescaled on the 0-1 range is smaller than 0.32, takes a value of 0.5 if the index of official bank supervision if greater that 0.32 and smaller than 0.58, and takes a value of 0 if the index of official bank supervision is greater than 0.58. Missing values were imputed using a linear projection of the log of income per capita, the quality of government index, an index of rule of law, trade openness, financial depth, and an index of bank concentration. Source: own elaborations based on data from Barth et al. (2008) downloaded from Ross Levine's webpage (www.econ.brown.edu/fac/Ross-Levine/Publication/2007-better-worse-data.zip).
LKRI	Time-invariant variable that takes a value of 1 if the Barth et al. (2008) capital regulatory index rescaled on the 0-1 range is smaller than 0.42, takes a value of 0.5 if the index of official bank supervision if greater that 0.26 and smaller than 0.62, and takes a value of 0 if the index of official bank supervision is greater than 0.62. Missing values were imputed using the same linear projection used for LOSI Source: same as LOSI.
LPMI	Time-invariant variable that takes a value of 1 if the Barth et al. (2008) private monitoring index rescaled on the 0-1 range is smaller than 0.35, takes a value of 0.5 if the index of official bank supervision if greater that 0.26 and smaller than 0.5, and takes a value of 0 if the index of official bank supervision is greater than 0.62. Missing values were imputed using the same linear projection used for LOSI Source: same as LOSI.
VAGR	Real value added growth in industry i, country, c, over the period 1990-2000. Source: own computations based on UNIDO Industrial Statistics Database, 2006; Revisions 2 and 3. The CPI data used to deflate value added are from the IMF International Finance Statistics.
SHVA	Share of sector i's value added in total manufacturing value-added of country c in 1990. Source: own computations based on UNIDO data (see VAGR).
EF*PC	Index of External Financial Dependence for the US manufacturing sector in the 1990s interacted with credit to the private sector in the 1990s. Source: the index of external financial dependence is from Eichengreen et al. (2011), for credit to the private sector see PC.
EF*Y	Index of External Financial Dependence for the US manufacturing sector in the 1990s interacted with GDP per capita. Sources: see above.
OEF*PC	Index of External Financial Dependence for the US manufacturing sector in the 1980s interacted with credit to the private sector in the 1990s. Source: the index of external financial dependence is from Rajan and Zingales (1998); for credit to the private sector see PC.

Table 11: Summary Statistics

	N.Obs	Mean	Std. Dev.	Min	Max
Cross-sectional					
GROWTH	69	1.58	1.34	-4.20	4.53
LGDP	69	8.43	1.57	5.05	10.94
PC	69	0.46	0.34	0.04	1.37
LEDU	69	1.67	0.59	-0.30	2.50
LGC	69	2.68	0.30	1.94	3.46
LINF	69	2.40	1.03	1.03	5.84
LOPEN	69	4.09	0.50	3.02	5.36
Panel					
GROWTH	917	2.02	2.77	-21.00	13.86
LGDP	917	7.80	1.55	4.61	10.89
PC	917	0.40	0.37	0.01	2.70
LEDU	917	2.28	0.67	0.27	3.27
LGC	917	2.65	0.39	1.17	3.83
LINF	917	2.50	1.21	-3.56	6.91
LOPEN	917	4.12	0.60	2.05	6.08

Figure 1: Marginal E¤ect Using Cross-Country Data.

Figure 2: Semi-Parametric Regressions. The solid black lines plot the relationship between credit to the private sector obtained by allowing credit to the private to take a generic functional form. The dotted lines are 90% con…dence intervals and the light solid lines plot the quadratic …ts of columns 6 and 7 of Table 1. The left panel of the …gure is based on the model of column 6 of Table 1 and the right panel is based on the model of column 7 of Table 1 .

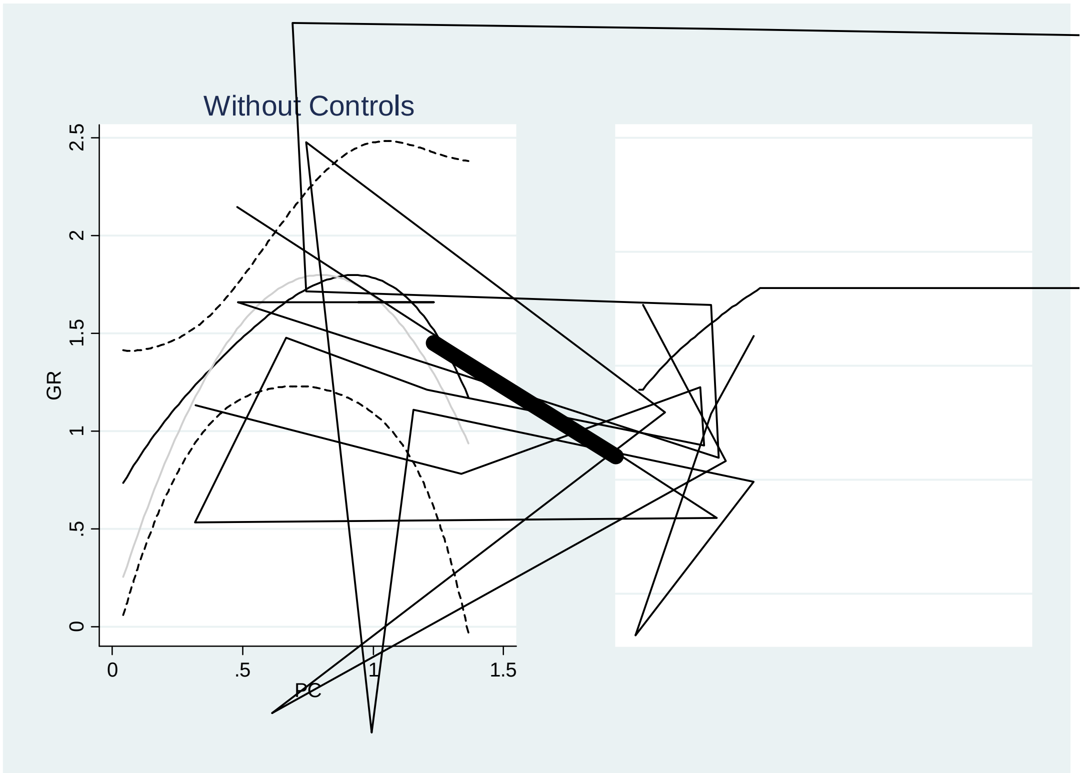

Figure 3:

Figure 4: Marginal Effect Using Panel Data. This figure plots the marginal effect of credit to the private sector on growth obtained from the regression of Table 5, column 4.

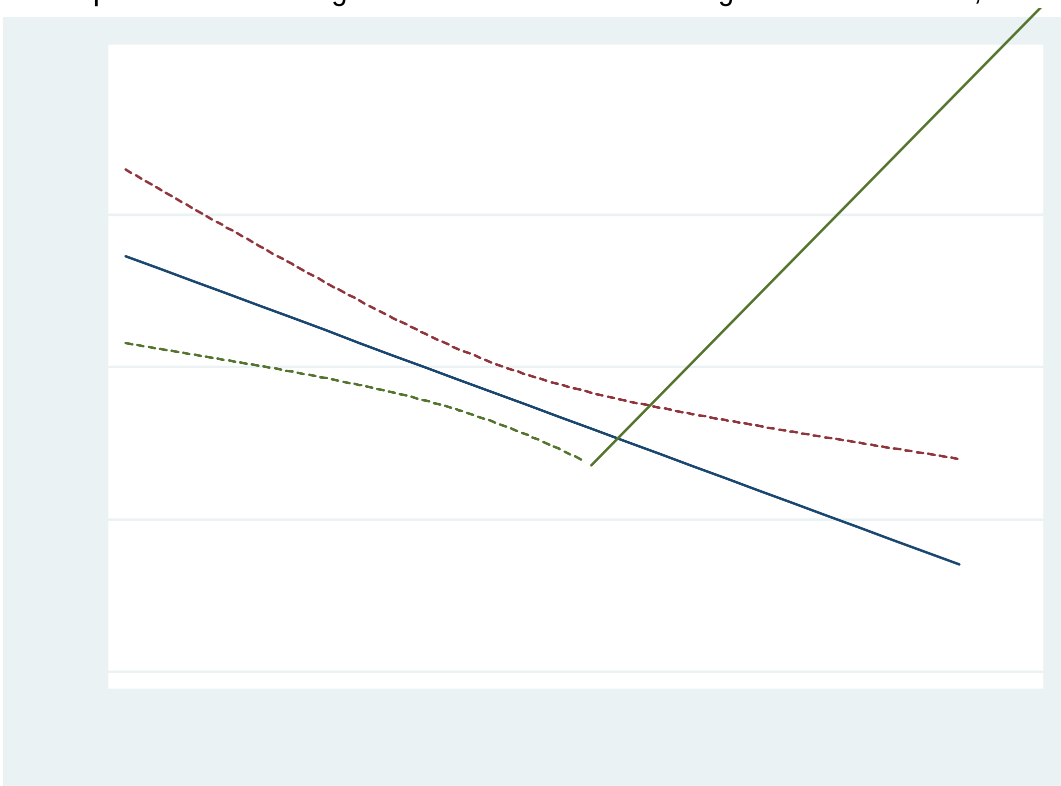

Figure 5: Countries with Large Financial Sectors (2006). This figure plots the 2006 level of credit to the private sector over GDP (PC) for all countries that in 2006 had values of PC>90%. The vertical line is at PC=110%.

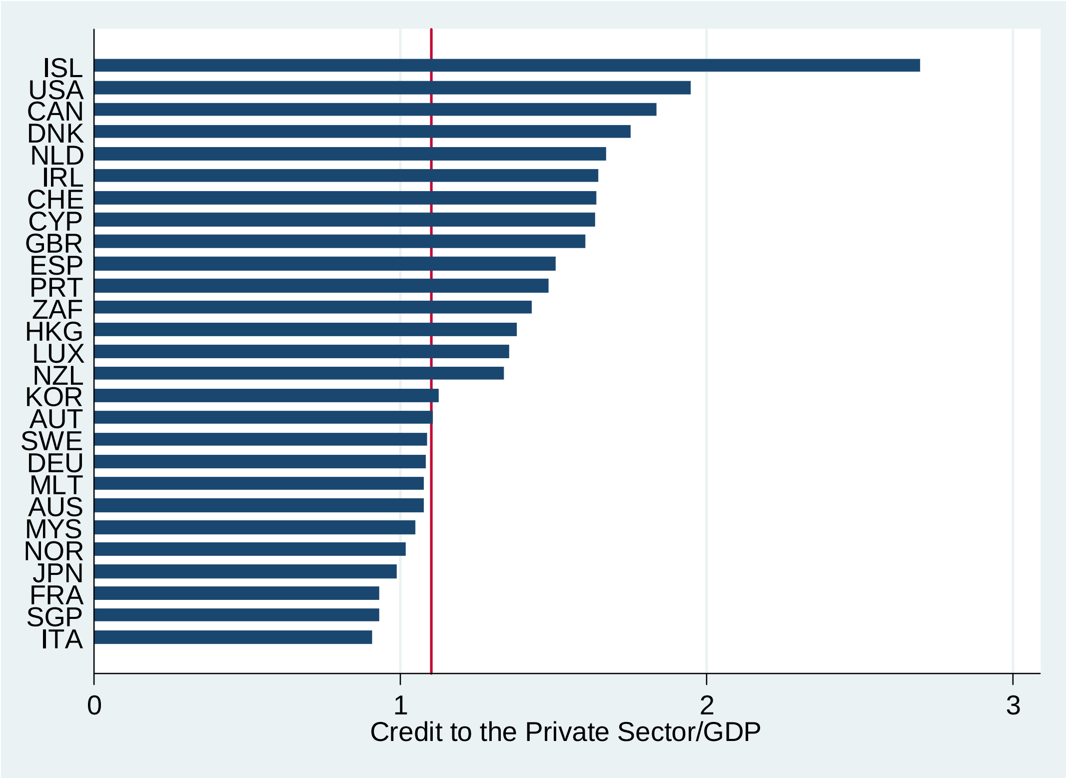

Figure 6: Semi-Parametric Regressions using Panel Data. The solid black lines plot the relationship between credit to the private sector obtained by allowing credit to the private to take a generic functional form and using the model of Column 7, Table 5. The dotted lines are 95% confidence intervals and the light solid lines plot the quadratic fits of column 7 of Table 5.

Figure 7: The Marginal Effect of Credit to the Private Sector with High and Low Output Volatility. This figure plots the marginal effect obtained from the regression of column 2 Table 7. The left panel is based on the coefficients of PC and PC^2. and the right panel is based on the coefficients of $PC + HVOL \quad PC$ and $PC^2 + HVOL \quad PC^2$.

Figure 8: The Marginal E¤ect of Credit to the Private Sector during Tranquil and Crisis Periods. This …gure plots the marginal e¤ect obtained from the regression of column 4 Table 7. The left panel is based on the coe¢ cients of PC and PC^2. and the right panel is based on the coe¢ cients of PC + BKCR PC and PC^2 + BKCR PC^2.

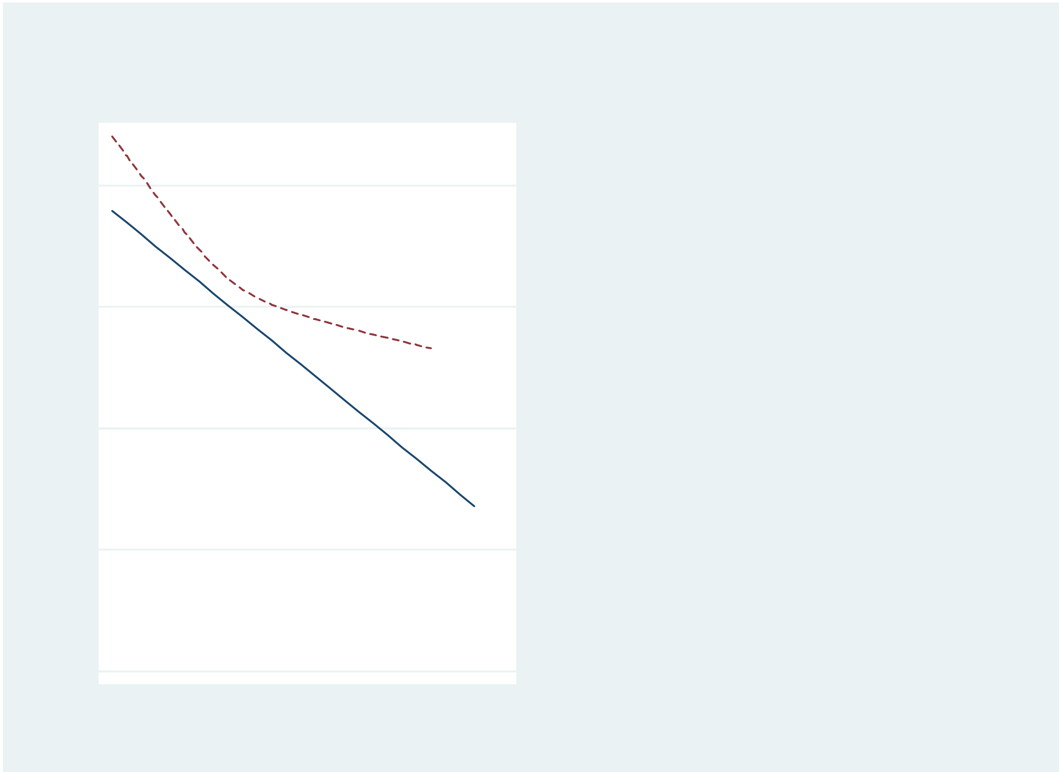

Figure 9: Heterogeneity in the the Marginal E¤ect of Credit to the Private Sector: