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Has Financial Deepening Done More Harm Than Good?

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Abstract

Looking back at half a century of financial expansion together with a host of financial crises, one can wonder if financial deepening has done more harm than good? No straight answer has emerged. The finance-growth literature and the banking crisis literature have left many researchers with conflicting and contradictory findings. Undoubtedly, there are both pros and cons to financial development, giving support to investigating the prevailing outcome of financial deepening over time. The present paper thereby contributes to analyzing the finance-growth nexus by providing new estimates supporting an overall damaging influence of financial deepening on economic growth. The evidence suggests that the negative influence of financial depth has stronger ties in high-income countries, with possibly growth-enhancing effects at the early stages of development. These estimates are robust to various time coverage, several estimators, two datasets, and an array of empirical exercises.

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1 Introduction

Looking back at half a century of financial expansion together with a host of financial crises, one can wonder what the prevailing outcome of financial deepening over time is. Has financial development done more harm than good?

No straight answer has emerged. The finance-growth literature and the banking crisis literature have left many researchers with conflicting and contradictory findings. Up to the financial crisis, the literature has been quite confident regarding the growth-enhancing properties of financial sector's expansion (King and Levine, 1993; Levine et al, 2000; Rioja and Valev, 2004; Demetriades and Law, 2006). However, recent studies show that the former positive relationship between finance and growth is not as strong as it was (Rousseau and Wachtel, 2011; Capelle-Blancard and Labonne, 2016; Demetriades and Rousseau, 2016). Together with the evident damaging impact of the financial crisis on subsequent economic growth (Kaminsky and Reinhart, 1999; Jordà et al, 2016; Grjebine and Tripier, 2017), these findings have led several studies to reconsider prior conclusions and investigate potential non-linearities. To provide a convincing reading through these puzzling conclusions, a strand of the literature concludes that financial deepening starts harming output growth when credit to the private sector roughly reaches a certain threshold (see, for instance, the contribution of Cecchetti and Kharroubi, 2012; Arcand et al, 2015; Benczur et al, 2019; Swamy and Dharani, 2020). However, far from gaining the full support of the entire economic community, recent contributions provide a body of evidence that dismisses a threshold's relevance in the finance-growth nexus (Karagiannis and Kvedaras, 2016; Botev et al, 2019; Fajeau, 2021). These studies emphasize that the threshold estimates are a byproduct of unaccounted heterogeneity and likewise sensitive to the estimation technique.

Undoubtedly, there are both pros and cons to financial development. The early work of Amable and Chatelain (1995) is among the first to document the ambivalence of financial deepening. Overall, the lack of a consensus is a defining characteristic of the finance-growth literature. One way to consider this issue and bridge these divergences is to consider that both strands document mutually compatible effects. On the one hand, financial development can funnel the growth process by enabling investments in physical and human capital (Galor and Zeira, 1993; Galor and Moav, 2004; Aghion et al, 2005). On the other hand, financial development can drain talents from the real sector (Tobin, 1984; Philippon and Reshef, 2013), stimulate unproductive allocation of resources, feed speculative bubble (e.g. mortgage credit, Beck et al (2012), encourage risk-taking and exacerbate fragility (Minsky, 1974) fostering "catastrophic meltdown" (Rajan, 2005).

These opposing strands of the literature give support to investigating the overall net effect. The average effect provides an answer as to the prevailing outcome of financial depth overtime. The present paper intends to contribute to the literature in this regard. Its primary contributions are: i) a focus on the soundness of the mainstream econometric methodology, i) a new dataset resulting in additional countries and observations, ii) the inclusion of data since the global financial crisis, iii) new and comprehensive evidence on the overall finance-growth nexus.

The paper proceeds as follows. Section 2 overviews data and methodology. Then, section 3 provides several estimates and discusses the results. Finally, section 4 concludes this study.

2 Methodology

This section provides an outlook at the econometric specification, the datasets and lastly the estimation method used.

2.1 Econometric Specification

This study aims to assess the overall finance-growth relationship. The standard estimated model proceeds as follows. Define the logarithmic growth in real GDP per capita for country i between t and $t+k$ as $\Delta y_{i,t+k}$. Let's denote $y_{i,t}$ as the initial level of log GDP per capita, and y_i^* the long-run (or steady-state) value. Generic forms of growth estimation equation are usually obtained from a first-order approximation of the neoclassical growth model (Mankiw, 1995), such that one can derive:

$$\Delta y_{i,t+k} = \lambda \left(y_{i,t} - y_i^* \right)$$

where λ is the classical conditional convergence parameter. For practical purposes, the literature implicitly assumes that y_i^* can be modeled as a linear function of several variables that impact the structure of the economy (Bekaert et al, 2005). Control variables enter the empirical growth studies on this account. The estimated finance-growth model has the following form:

$$\begin{aligned} \Delta y_{i,t+k} &= \lambda y_{i,t} + \beta PC_{i,t} + \gamma \mathbf{x}_{i,t} + \nu_{it+k} \\ \nu_{it+k} &= \mu_i + \kappa_{t+k} + \varepsilon_{i,t+k} \end{aligned} \tag{1}$$

where the subscripts i and t refer to cross-section unit and time period. $PC_{i,t}$ is the ratio of private credit over GDP used as a proxy for financial development. $\mathbf{x}_{i,t}$ is the set of control variables. Finally, ν_{it} follows a two-way error component model where μ_i, κ_t and $\varepsilon_{i,t}$ are respectively the country-specific effect, the period-specific effect and the error term. The inclusion of time dummies allows capturing period-specific effects, proxying for world economic conditions.

2.2 Data

Throughout the study, the independent variable is economic growth, measured as the log-difference of real GDP per capita (WDI, World Bank, 2018). The study rests on credit to the private sector by deposit money banks and other financial institutions as a ratio of GDP (private credit) as a proxy for financial depth.

All regressions are conducted based on a set of common control variables: the initial GDP per capita to capture convergence and provide a dynamic feature in the panel estimates (Barro, 1991; Bun and Sarafidis, 2015), average years of education gathered from Barro and Lee (2013) to account for human capital, a measure of trade openness (Frankel and Romer, 1999), and two measures of macroeconomic stabilization, the inflation rate[1] (Barro, 1995;

[1]To deal with possible negative value using log of this variable, we apply the inverse hyperbolic sine transformation: $\ln(\text{infl}) \equiv \ln\left(\text{infl} + \sqrt{\text{infl}^2 + 1}\right)$. The data is gathered from WDI, (World Bank, 2018).

Rousseau and Wachtel, 2002) and government consumption normalized by GDP to account for fiscal adjustments (Alesina and Wacziarg, 1998; Sala-i Martin et al, 2004).

As a robustness check and for comparison purposes with existing literature, this study also works with an older dataset gathered from Arcand et al (2015) and ranging from 1960 to 2010. It is worth noting that the new dataset does not exactly match the former. There are inevitable data revisions, where some values are reclassified as missing, and some become available. The correlations, however, are usually close to 0.98 within the sample (including the proxy for financial depth). For more details, see the Data Appendix page 14.

2.3 Estimation Methods

The finance-growth nexus is no exception to the well known empirical struggle to identify a causal impact. The recent finance-growth literature heavily relies on internal instrument identification strategies in the spirit of Arellano and Bond (1991) and Arellano and Bover (1995). The mainstream estimations boil down to dynamic panel data estimates based on System-GMM estimator using five-year periods to smooth out business cycle (Cecchetti and Kharroubi, 2012; Arcand et al, 2015; Sahay et al, 2015; Benczur et al, 2019; Cheng et al, 2020). However, recent studies emphasize that only limited attention is drawn to the potential fragility of such System-GMM identification strategies (Bazzi and Clemens, 2013; Fajeau, 2021).

The Difference-GMM estimator is a suited—albeit not ideal—candidate to address some of the System-GMM limitations, notably the instrument proliferation issue. It fully controls for both the country- and period-specific effects while providing a setup related closely to the mainstream estimation methodology. To complement these estimates, all regressions are estimated based on the fixed effect OLS estimator. Its advantage over other internal instrument estimators rests in is its transparency and simplicity. Well aware of the limitations arising from the various estimates, they are intended to offer grounds for future research. It follows the idea that economists should not refrain from "pursuing pressing research questions until the perfect methods arrive" (Bazzi and Clemens, 2013, p.31).

3 Results

This section provides the results from various specifications. The first subsection presents the baseline evidence. The following subsections provide additional robustness tests refining the conclusion.

3.1 Baseline Result : An Overall Adverse Effect

Table 1 provides Difference-GMM estimates throughout columns (1-4). Careful attention is paid to limit the instrument count to avoid problems stemming from excessive instrument proliferation. To this end, the estimations rely on only one lag of instruments, allowing a manageable number of instruments, mitigating concerns that excessive instrument prolifer-

Table 1: The damaging impact of financial deepening.

	GMM-Difference				OLS-FE			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dataset	Old	Old	New	New	Old	Old	New	New
Period	1960-2010	1980-2010	1960-2015	1980-2015	1960-2010	1980-2010	1980-2015	1990-2015
Private Credit	-4.904***	-6.890***	-6.502***	-8.540***	-1.795***	-2.474***	-1.485***	-2.051***
	(1.607)	(2.247)	(1.153)	(2.035)	(0.442)	(0.581)	(0.470)	(0.506)
	Other parameter estimates omitted for clarity							
N. instruments	99	47	112	60	–	–	–	–
N. countries	130	130	137	136	133	133	140	140
Observations	784	527	915	658	917	660	824	637
AR(2) (p-value)	0.29	0.06	0.99	0.36	–	–	–	–
Hansen test (p-value)	0.39	0.23	0.47	0.10	–	–	–	–
R^2	–	–	–	–	0.27	0.32	0.28	0.26

Notes: This table reports the results of a set of dynamic panel estimations in which the dependent variable is the average real GDP per capita growth rate. All regressions contain time and country fixed effects. While the first four columns present difference-GMM estimations with the instruments set restricted to one lag, the subsequent columns report OLS fixed effect regressions. The null hypothesis of the AR(2) serial correlation test is that the errors in the first difference regression exhibit no second-order serial correlation. Control variables are in logs. The null hypothesis of the Hansen test is that the instruments fail to identify the same vector of parameters (see Parentes and Silva, 2012). Robust Windmeijer standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

ation could compromise the estimation results' reliability.[2] Whether it is the new or the old dataset, the estimations display an overall negative association between finance and growth.

Focusing on post-1980s observations, in columns (2) and (4), magnifies the coefficient size. Moreover, including the Great Financial Crisis within the sample's scope lead to an even higher coefficient (columns 3 and 4). The relationship between finance and growth has degenerated over time, reinforcing the intuition that no economic association is an immutable law (Rousseau and Wachtel, 2011).

As the weak instrument issue is still of serious concern with this identification strategy, one should handle these estimates with caution. Columns (4-8) favor the OLS fixed effect estimator. The latter also deals with the endogeneity stemming from time-invariant country's specifics. The absence of instruments, and thereby weak instrument proliferation, reduces potential overfitting issue (Fajeau, 2021). These additional estimates provide support for an overall negative association. A similar pattern emerges with a stronger association for more recent periods.

Altogether, the various estimates displayed in Table 1 provide evidence of a rather damaging influence of financial development on economic growth. This finding is in line with a recent strand of the literature, unveiling similar conclusions on various sample sizes (Cournède and Denk, 2015; Demetriades et al, 2017; Karagiannis and Kvedaras, 2016; Cecchetti and Kharroubi, 2015; Benczur et al, 2019; Cheng et al, 2020). These first estimates constitute a starting point on which the analysis must presently be refined.

[2]The estimates from Table 1 are robust to collapsing the instrument set. See Table A4 on page 17 in the Appendix.

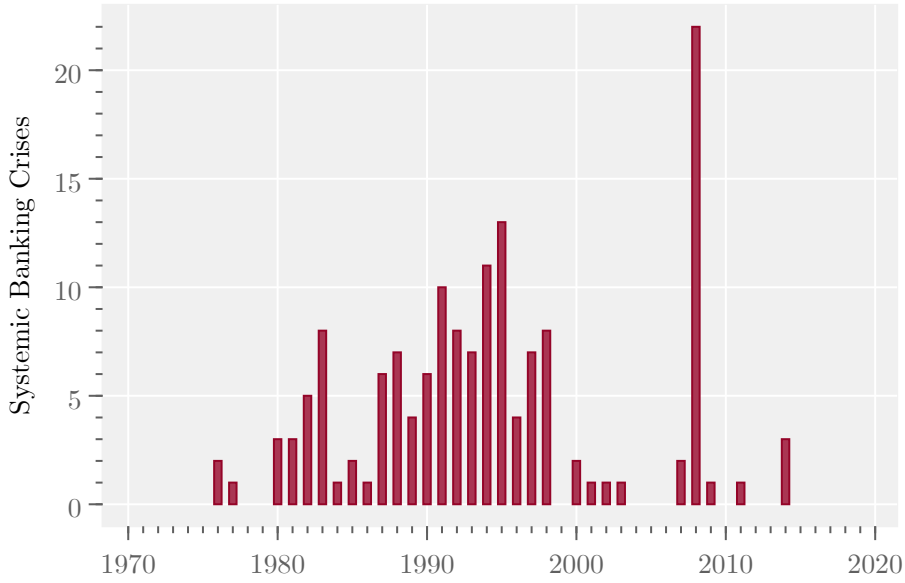

Figure 1: Occurrence of 151 systemic financial crises in the world since 1970. Source: *Systemic Banking Crisis Database* (Laeven and Valencia, 2018).

3.2 An Adverse Effect Beyond Systemic Banking Crises

Figure 1 underlines that systemic banking crises are legions since the 1970s, with a strong emphasis on 2008's financial crisis. As highlighted in the previous section, including the Great Financial Crisis within the sample's scope systematically lead to a higher coefficient. At this stage, the natural question is to wonder if the occurrence of financial crises is possibly driving the overall adverse result? To provide an answer to this question, Table 2 displays the same estimates, this time controlling for systemic banking crises based on Laeven and Valencia (2018). Banking crises are negatively related to GDP growth, which corroborates previous evidence on the matter (Kaminsky and Reinhart, 1999; Jordà et al, 2016; Grjebine and Tripier, 2017).

The estimates reveal that financial distress is a substantial channel underlying the adverse effect of private credit. This impact is certainly undersized due to the time fixed effects capturing part of the Global Financial Crisis. The size of the coefficients is sensitive to the inclusion of a crisis dummy. The coefficient falls by about one-third or a half when financial crises are controlled for. However, point estimates for the financial depth proxy remain statistically significant. Banking crises are not the sole driver of the negative association between finance and growth. Nonetheless, it can partially account for the overall negative association between finance and growth.

3.3 Does One Size Fit All?

However, as the literature documents ambivalent effects, the relationship between finance and growth may vary according to the general economic development level. Is the average overall effect documented in this study masking some disparities? To answer this question,

Table 2: Growth effects of financial development controlling for systemic banking crises (Laeven and Valencia, 2018).

	GMM-Difference				OLS-FE			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dataset	Old	Old	New	New	Old	Old	New	New
Period	1960-2010	1980-2010	1960-2015	1980-2015	1960-2010	1980-2010	1980-2015	1990-2015
Private Credit	-2.874**	-3.049*	-4.764***	-5.253***	-1.355***	-1.870***	-1.678***	-1.851***
	(1.182)	(1.586)	(1.121)	(1.972)	(0.433)	(0.591)	(0.525)	(0.689)
Banking Crisis	-1.906***	-1.935**	-2.534***	-1.917***	-1.232***	-1.201***	-1.285***	-0.832***
	(0.651)	(0.882)	(0.485)	(0.726)	(0.238)	(0.273)	(0.258)	(0.257)
	Other parameter estimates omitted for clarity							
Observations	739	527	915	658	872	660	666	487
N. Countries	130	130	137	136	133	133	136	135
R^2	–	–	–	–	0.29	0.35	0.37	0.32
N. Instruments	107	54	122	69				
AR(2) test p-value	0.301	0.173	0.753	0.200	–	–	–	–
Hansen test p-value	0.441	0.060	0.504	0.062	–	–	–	–

Notes: This table reports the results of a set of dynamic panel estimations in which the dependent variable is the average real GDP per capita growth rate. All regressions contain time and country fixed effects. See complete Table A17 in the appendix for omitted parameters. While the first four columns present difference-GMM estimations with the instruments set restricted to one lag, the subsequent columns report OLS fixed effect regressions. The null hypothesis of the AR(2) serial correlation test is that the errors in the first difference regression exhibit no second-order serial correlation. Control variables are in logs. The null hypothesis of the Hansen test is that the instruments fail to identify the same vector of parameters (see Parentes and Silva, 2012). Robust Windmeijer standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

I also explore the differential effects of private credit on growth across countries at various development stages. Focusing on smaller sub-groups of countries to investigate cross-country heterogeneity could reduce the degrees of freedom and thereby the estimator's reliability. Therefore, I account for differentiated effects based on income group dummies instead of dissociated estimations. To this purpose, the following model is estimated:

$$\Delta y_{i,t+k} = \lambda y_{i,t} + \beta_1 PC_{i,t} + \beta_2 (PC_{i,t} \times \mathbb{1}_{MH,i}) + \beta_3 (PC_{i,t} \times \mathbb{1}_{ML,i}) + \gamma \mathbf{x}_{i,t} + \nu_{it+k}$$
$$\nu_{it+k} = \mu_i + \kappa_{t+k} + \varepsilon_{i,t+k}$$

Table 3 reports the estimates for this interaction model along with the linear combinations of coefficients estimates with significance tests in the bottom panel. Consistent patterns emerge from high-income economies. The estimates show that high-income economies drive the overall adverse effect previously documented. *Private Credit* is rather positively associated with growth in medium-low and low-income economies, albeit not systematically in a significant way. These findings suggest that financial depth has a different effect on growth depending on the income region the economies belong to. These estimates support a non-monotonous finance-growth nexus, not based on the level of financial depth but rather on the development stage of an economy.

Table 3: Financial development growth effects with regions.

	GMM-Difference				OLS-FE			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dataset	Old	Old	New	New	Old	Old	New	New
Period	1960-2010	1980-2010	1960-2015	1980-2015	1960-2010	1980-2010	1980-2015	1990-2015
Private Credit	-4.941***	-7.872***	-5.542***	-8.394***	-2.280***	-2.894***	-2.125***	-3.132***
	(1.259)	(2.016)	(1.206)	(2.081)	(0.477)	(0.692)	(0.670)	(0.756)
Private Credit	1.807	-0.274	1.733	2.810	1.613**	0.829	2.495**	1.726
×𝟙Medium-high inc.	(2.311)	(5.094)	(2.064)	(2.472)	(0.794)	(1.029)	(0.978)	(1.853)
Private Credit	12.515**	15.961***	3.037	6.896	4.169***	5.375***	5.868***	6.388***
×𝟙Medium-low & Low inc.	(5.731)	(6.130)	(3.374)	(4.756)	(1.528)	(1.292)	(1.745)	(2.419)
	Other parameter estimates omitted for clarity							
Observations	784	527	915	658	917	660	666	487
N. Countries	130	130	137	136	133	133	136	135
R^2	–	–	–	–	0.28	0.35	0.33	0.32
N. Instruments	129	61	132	78				
AR(2) test (p-value)	0.264	0.078	0.864	0.195	–	–	–	–
Hansen test (p-value)	0.262	0.693	0.511	0.076	–	–	–	–
Linear combinations of parameters for private credit								
High income	-4.941***	-7.872***	-5.542***	-8.394***	-2.280***	-2.894***	-2.125***	-3.132***
	(1.259)	(2.016)	(1.206)	(2.081)	(0.477)	(0.692)	(0.670)	(0.756)
Medium-high income	-3.133	-8.145*	-3.809*	-5.583**	-0.667	-2.064**	0.370	-1.405
	(-2.159)	(4.625)	(2.106)	(2.401)	(0.769)	(0.983)	(0.959)	(1.798)
Medium-low & Low income	7.574	8.088	-2.505	-1.498	1.889	2.480**	3.742**	3.256
	(5.213)	(6.189)	(3.318)	(4.802)	(1.471)	(1.220)	(1.701)	(2.457)

Notes: This table reports the results of a set of dynamic panel estimations in which the dependent variable is the average real GDP per capita growth rate. All regressions contain time and country fixed effects. See complete Table A16 in the appendix for omitted parameters. While the first four columns present difference-GMM estimations with the instruments set restricted to one lag, the subsequent columns report OLS fixed effect regressions. The null hypothesis of the AR(2) serial correlation test is that the errors in the first difference regression exhibit no second-order serial correlation. Control variables are in logs. The null hypothesis of the Hansen test is that the instruments fail to identify the same vector of parameters (see Parentes and Silva, 2012). Robust Windmeijer standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

3.4 Growth, Financial Development and GDP level

Finance might be crucial at the early stages of development, by reducing the need to finance projects from own funds, it could enable firms to engage in growth-enhancing activities (Galor and Moav, 2004; Aghion et al, 2005; Levine, 2005). The estimates from Table 3 suggests a non-monotonous finance-growth nexus based on the development stage of an economy. This evidence calls for additional investigation.

Table 4 presents various estimations based on several estimations methods interacting *private credit* and GDP per capita. First, the Difference-GMM estimates in the first two columns are somewhat inconclusive and fail to find a precise threshold. However, turning to the OLS fixed-effects estimates in columns (3) and (4) provide precisely estimated thresholds around 8,500$ of GDP per capita. Figure 2 displays the marginal effect of *Private Credit*. Bellow the threshold private credit is positively associated with future growth, whereas it exerts an adverse effect on subsequent growth above this threshold. This finding is consistent with the evidence from previous Table 3.

Table 4: Institution interaction, inital GDP/capita.

Estimator:	DIFF-GMM		OLS-FE		HPT-FE	
NEW dataset	(1)	(2)	(3)	(4)	(5)	(6)
Period:	1960-2015	1980-2015	1960-2015	1980-2015	1960-2015	1980-2015
inital GDP/capita	-3.169***	-2.310*	-3.922***	-5.399***	-4.135***	-5.569***
	(0.806)	(1.206)	(0.397)	(0.708)	(0.618)	(0.472)
Private Credit	4.358	13.810	10.719***	12.298***		
	(5.827)	(9.053)	(2.645)	(3.339)		
Inital GDP/capita	-0.790	-1.784**	-1.184***	-1.375***		
× Private Credit	(0.582)	(0.860)	(0.267)	(0.325)		
Private Credit					8.201***	0.595
IF inital GDP/capita $< \tau$					(2.492)	(0.626)
Private Credit					-1.401***	-1.866***
IF inital GDP/capita $\geq \tau$					(0.497)	(0.448)
	Other parameter estimates omitted for clarity					
Observations	915	658	1055	798	352	546
N. Countries	137	136	140	140	32	78
R^2	–	–	0.28	0.31	0.41	0.39
N. Instruments	128	68	–	–	–	–
AR(2) test (p-value)	0.653	0.069	–	–	–	–
Hansen test (p-value)	0.330	0.034	–	–	–	–
Threshold τ	5.51	7.74	9.05	8.95	7.31	9.95
Threshold 90% CI	[2.80-8.22]	[5.03–10.45]	[8.63–9.48]	[8.30–9.58]	[7.24–7.32]	[9.91–9.96]
Threshold-effect F-test (p-value)	–	–	–	–	0.06	0.01

Notes: This table reports the results of a set of dynamic panel estimations in which the dependent variable is the average real GDP per capita growth rate. All regressions contain time and country fixed effects. The threshold τ is Log(inital GDP/capita). See complete Table A7 in the appendix for omitted parameters. The null hypothesis of the AR(2) serial correlation test is that the errors in the first difference regression exhibit no second-order serial correlation. Control variables are in logs. The null hypothesis of the Hansen test is that the instruments fail to identify the same vector of parameters (Parentes and Silva, 2012). Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

To ascertain these findings, I provide additional estimates based on a fixed-effect panel threshold method (Hansen, 1999; Wang, 2015):

$$\Delta y_{i,t+k} = \lambda y_{i,t} + \beta_1 \left(y_{i,t} < \tau\right) PC_{i,t} + \beta_2 \left(y_{i,t} \geq \tau\right) PC_{i,t} + \gamma \mathbf{x}_{i,t} + \nu_{it+k}\mu_i + \kappa_{t+k} + \varepsilon_{i,t+k}$$

where the threshold variable $y_{i,t}$ represents the GDP per capita (in logs), and τ is the threshold parameter that divides the equation into two regimes with β_1 and β_2 as respective coefficients. This technique has the advantage of not imposing a priori restriction on the relationship.

The results are reported in columns (5) and (6). For the first column covering 1960-2015, the threshold is evaluated at 1,500$. The estimates provide evidence of a highly positive association between finance and growth for low-income economies at very early development stages. Above the reasonably low threshold, the estimate supports a significantly negative effect corroborating the previous results in this section. Focusing on a more balanced and recent sample in column (6), the threshold is precisely estimated at a much higher level. However, this time, there is no significant association between finance and growth below this

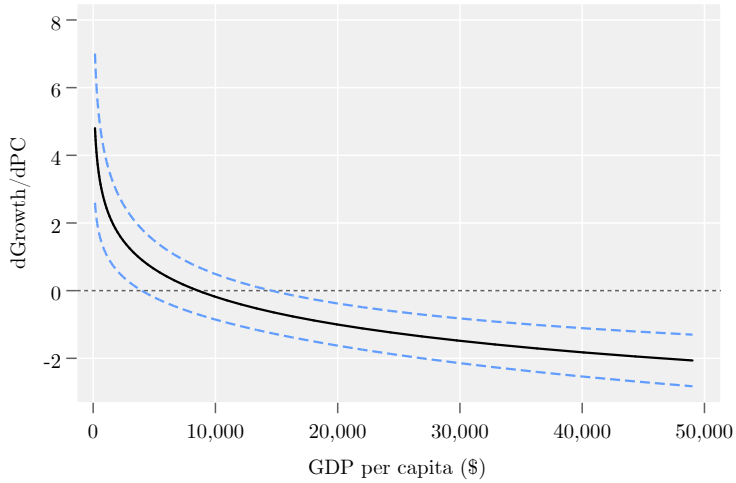

Figure 2: Estimated *Private Credit* parameter over the observed range of GDP per capita for 1960-2015 in the new sample. The solid black line plots the marginal effect of *Private Credit* from Table 4, column (3). The solid light lines are 90% confidence intervals. The threshold estimated is estimated at a level of GDP per capita of 8,518$.

threshold value. Above the threshold, economies once again experience the adverse effect of financial depth. The estimates from column (6) corroborate the evidence of the negative influence of financial depth being driven by economies at a higher stage of development.

For further robustness checks on the adverse effect of financial depth on growth, I also ran estimations controlling for 15 additional institutions proxies extracted from the Worldwide Governance Indicators database of Kraay et al (2010), the Economic Freedom of the World database of the Fraiser Institute (Gwartney et al, 2008), and the Quality of Governance database (Teorell et al, 2020). Overall, interactions with these various institution proxies failed to deliver a clear threshold, certainly due to a very scarce country and time coverage. For example, the Quality of Governance database covers only post-2000 observations. Nonetheless, the overall adverse effect remains robust to these smaller samples.[3]

4 Conclusions

The present paper analyzes the finance-growth nexus by providing alternative estimates supporting the hypothesis that overall financial deepening has done more harm than good. It contributes to the literature by establishing a globally negative finance-growth nexus, with a stronger emphasis in recent periods. The relationship between finance and growth has degenerated over time, reinforcing the intuition that no economic association is an immutable law. These estimates are robust to various time coverage, three estimation techniques, two datasets, and several empirical exercises.

Financial deepening undoubtedly has pros and cons. This paper's evidence suggests that the cons overweighted the pros. Indeed, financial expansion is known to drain talents from the

[3]See the appendix page 19.

real sector (Tobin, 1984; Philippon and Reshef, 2013), stimulate unproductive allocation of resources, feed speculative bubble (e.g. mortgage credit, Beck et al (2012), encourage risk-taking and exacerbate fragility (Minsky, 1974) fostering "catastrophic meltdown" (Rajan, 2005). The estimates reveal that financial crises are indeed a substantial channel underlying private credit's adverse effect. Along the liberalization process, many countries experienced episodes of financial distress. An inadequate sequencing of reform might be behind such a detrimental outcome, calling for proper supervision and regulation of the financial system. This paper invites additional research and provides grounds to explore further the impact of the financial sector development on economic growth.

Evidence suggests that the negative influence of financial depth is stronger in high-income countries, with ambivalent yet possibly growth-enhancing effects at the earliest stages of development. Thereby, these new estimates are not ruling out the plausibility of a non-monotonous finance-growth nexus based on the development stage of an economy.

From a policy perspective, the present paper's recommendations, far from advocating that financial deepening is irrelevant to growth, calls for a better alignment of the financial system to economic needs. Making the financial system more resilient would also certainly reduce the detrimental effect of financial deepening on growth. Regulators should further strengthen credit constraints to limit the excessive expansion of financial credit. The massive expansion associated with credit easing as a monetary answer to the great financial crisis should be considered cautiously in light of the unprecedented rise of household credit.

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Appendix

A Data Appendix

Table A1: Correlation matrix.

Panel 1960-2010 old						
	Growth	Init.GDP/cap	Priv. Credit	School	Inflation	Trade
init.GDP/cap	0.087***	1				
Private Credit	0.007	0.675***	1			
School	0.168***	0.719***	0.511***	1		
Inflation	-0.110***	-0.165***	-0.276***	-0.020	1	
Trade	0.059*	0.192***	0.206***	0.308***	-0.167***	1
Gov. cons.	-0.128***	0.348***	0.274***	0.274***	-0.0913***	0.322***

Panel 1960-2015 new						
	Growth	Init.GDP/cap	Priv. Credit	School	Inflation	Trade
init.GDP/cap	0.013	1				
Private Credit	-0.008	0.646***	1			
School	0.134***	0.706***	0.521***	1		
Inflation	-0.095***	-0.164***	-0.291***	-0.060*	1	
Trade	0.055*	0.208***	0.211***	0.286***	-0.190***	1
Gov. cons.	-0.089***	0.388***	0.266***	0.299***	-0.073**	0.266***

Table A2: Summary Statistics.

Panel 1960-2015 new sample	Mean	σ	Obs.	Min	Max
Growth	2.108	2.765	1055	-16.84	14.28
init.GDP/cap	8.432	1.492	1055	5.139	11.56
Private Credit	0.399	0.366	1055	0.011	2.261
School	2.331	0.667	1055	0.371	3.291
Inflation	2.475	1.378	1055	-2.065	10.06
Trade	4.127	0.641	1055	-1.743	6.047
Gov. cons.	2.643	0.372	1055	1.143	3.772
Panel 1960-2010 old sample	**Mean**	σ	**Obs.**	**Min**	**Max**
Growth	2.024	2.766	917	-21.00	13.86
init.GDP/cap	7.796	1.548	917	4.606	10.89
Private Credit	0.400	0.370	917	0.007	2.698
School	2.278	0.671	917	0.265	3.274
Inflation	2.495	1.211	917	-3.564	6.908
Trade	4.118	0.599	917	2.049	6.082
Gov. cons.	2.653	0.390	917	1.169	3.828

B Damaging Impact of Finance on Growth

Table A3: Alternative estimates: the damaging impact of financial deepening, Difference-GMM estimates, 1 lag IV matrix.

Difference-GMM	(1)	(2)	(3)	(4)
Dataset	Old	Old	New	New
Period	1960-2010	1980-2010	1960-2015	1980-2015
inital GDP/capita	-2.051	-3.059	-2.718**	-3.863**
	(1.493)	(2.297)	(1.141)	(1.646)
Private Credit	-4.904***	-6.890***	-3.818**	-8.540***
	(1.607)	(2.247)	(1.500)	(2.035)
School	-2.202*	-2.538	-2.316**	-3.923
	(1.166)	(2.973)	(1.019)	(2.764)
Government consumption	-0.501	-0.760	-2.188*	-1.742
	(1.065)	(1.401)	(1.245)	(1.299)
Trade openness	4.101***	4.911*	2.072	1.460
	(1.079)	(2.890)	(1.321)	(1.262)
Inflation rate	-0.198	-0.303	-0.286	-0.220
	(0.236)	(0.297)	(0.272)	(0.220)
Observations	784	527	436	658
N. Countries	130	130	95	136
N. Instruments	99	47	63	60
AR(2) test (p-value)	0.29	0.06	0.87	0.36
Hansen test (p-value)	0.39	0.23	0.53	0.10
Country FE	YES	YES	YES	YES
Time FE	YES	YES	YES	YES

Notes: This table reports the results of a set of dynamic panel estimations in which the dependent variable is the average real GDP per capita growth rate. All regressions contain time and country fixed effects. Difference-GMM estimations with the instruments set restricted to one lag. The null hypothesis of the AR(2) serial correlation test is that the errors in the first difference regression exhibit no second-order serial correlation. Control variables are in logs. The null hypothesis of the Hansen test is that the instruments fail to identify the same vector of parameters (see Parentes and Silva, 2012). Robust Windmeijer standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table A4: Alternative estimates: the damaging impact of financial deepening, Difference-GMM estimates, collapsed IV matrix.

Difference-GMM	(1)	(2)	(3)	(4)
Dataset	Old	Old	New	New
Period	1960-2010	1980-2010	1960-2015	1980-2015
inital GDP/capita	-3.539**	-9.579***	-3.245*	-5.178*
	(1.564)	(3.574)	(1.969)	(2.888)
Private Credit	-2.592	-8.361**	-5.671**	-7.035***
	(1.704)	(3.906)	(2.860)	(2.456)
School	-0.745	-8.483	-2.339	-3.716
	(2.021)	(5.510)	(2.355)	(4.268)
Government consumption	1.583	0.796	0.370	-1.245
	(1.393)	(2.070)	(2.373)	(1.448)
Trade openness	2.800	6.191	1.563	-0.103
	(2.414)	(3.795)	(2.554)	(1.659)
Inflation rate	-0.540	-0.591	-0.650	-0.378
	(0.330)	(0.380)	(0.465)	(0.249)
Observations	784	527	436	658
N. Countries	130	130	95	136
N. Instruments	57	29	39	36
AR(2) test (p-value)	0.06	0.17	0.93	0.66
Hansen test (p-value)	0.14	0.01	0.09	0.01
Country FE	YES	YES	YES	YES
Time FE	YES	YES	YES	YES

Notes: This table reports the results of a set of dynamic panel estimations in which the dependent variable is the average real GDP per capita growth rate. All regressions contain time and country fixed effects. Difference-GMM estimations with a collapsed instruments set. The null hypothesis of the AR(2) serial correlation test is that the errors in the first difference regression exhibit no second-order serial correlation. Control variables are in logs. The null hypothesis of the Hansen test is that the instruments fail to identify the same vector of parameters (see Parentes and Silva, 2012). Robust Windmeijer standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table A5: Alternative estimates: the damaging impact of financial deepening, OLS-FE estimates.

OLS-FE	(1)	(2)	(3)	(4)
Dataset	Old	Old	New	New
Period	1960-2010	1980-2010	1960-2015	1980-2015
inital GDP/capita	-3.537***	-5.488***	-5.602***	-5.778***
	(0.549)	(0.661)	(0.618)	(0.896)
Private Credit	-1.795***	-2.474***	-1.485***	-2.051***
	(0.442)	(0.581)	(0.470)	(0.506)
School	-1.801**	-1.613*	-0.913	-1.060
	(0.703)	(0.928)	(0.995)	(2.052)
Government consumption	-1.763***	-1.393***	0.079	1.471*
	(0.468)	(0.513)	(0.612)	(0.846)
Trade openness	2.426***	2.198***	1.037*	0.073
	(0.517)	(0.435)	(0.585)	(0.814)
Inflation rate	-0.201*	-0.349***	-0.203*	-0.145
	(0.106)	(0.111)	(0.111)	(0.124)
Observations	917	660	824	637
N. Countries	133	133	140	140
R^2	0.271	0.321	0.282	0.258
Country FE	YES	YES	YES	YES
Time FE	YES	YES	YES	YES

Notes: This table reports the results of a set of dynamic panel estimations in which the dependent variable is the average real GDP per capita growth rate. All regressions contain time and country fixed effects. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

C Non-linearities & Institutions

Table A6: Summary Statistics.

Worldwide Governance Indicators 1996-2015 (Kraay et al, 2010)					
Worldwide Governance Index (6 dimensions)	254	0.440	5.457	-9.643	11.36
Voice and Accountability	254	0.066	0.950	-1.858	1.733
Political Stability and Abs. of Violence/Terrorism	254	-0.069	.931	-2.675	1.595
Government Effectiveness	254	0.137	0.993	-1.629	2.241
Regulatory Quality	254	0.180	0.928	-2.236	1.876
Rule of Law	254	0.073	1.000	-1.818	1.968
Control of Corruption	254	0.051	1.037	-1.387	2.358
Economic Freedom of the World 1975-2015 (Gwartney et al, 2008)					
Economic Freedom Index	694	6.305	1.308	1.99	9.07
Credit market regulation	733	7.241	2.219	0	10
Regulation	673	6.349	1.239	2.473	9.381
Quality of Governance 2000-2015 (Teorell et al, 2020)					
State Fragility Index	336	8	6.154	0	24
Functioning of Government	308	61.82	9.287	32.8	88.6
Rule of Law	308	54.61	18.91	10	90
Economic Freedom Index	308	55.84	19.34	0	95
Systemic Banking Crises 1960-2015 (Laeven and Valencia, 2018)					
Systemic Banking Crisis (100 events)	1,055	0.094	0.293	0	1
Financial Liberalization 1975-2010 (Abiad et al, 2010)					
Financial Reform Index	410	0.585	0.286	0	1

Table A7: Institution interaction, inital GDP/capita.

Estimator:	DIFF-GMM		OLS-FE		HPT-FE	
	(1)	(2)	(3)	(4)	(5)	(6)
Period:	1960-2015	1980-2015	1960-2015	1980-2015	1960-2015	1980-2015
inital GDP/capita	-3.169***	-2.310*	-3.922***	-5.399***	-4.135***	-5.569***
	(0.806)	(1.206)	(0.397)	(0.708)	(0.618)	(0.472)
Private Credit	4.358	13.810	10.719***	12.298***		
	(5.827)	(9.053)	(2.645)	(3.339)		
inital GDP/capita	-0.790	-1.784**	-1.184***	-1.375***		
× Private Credit	(0.582)	(0.860)	(0.267)	(0.325)		
Private Credit					8.201***	0.595
IF inital GDP/capita $< \tau$					(2.492)	(0.626)
Private Credit					-1.401***	-1.866***
IF inital GDP/capita $\geq \tau$					(0.497)	(0.448)
School	-2.441***	0.621	-1.585**	-1.113	2.143***	0.027
	(0.844)	(1.620)	(0.636)	(0.935)	(0.754)	(0.640)
Inflation rate	-0.176	0.134	-0.123	-0.206**	-0.233**	-0.243***
	(0.178)	(0.245)	(0.088)	(0.099)	(0.103)	(0.086)
Trade openness	1.132	1.633	1.507***	1.535***	0.817*	1.586***
	(0.793)	(1.239)	(0.419)	(0.426)	(0.438)	(0.403)
Government consumption	-0.915	0.134	-1.052**	-0.755	-2.159***	-1.106***
	(0.854)	(1.445)	(0.429)	(0.534)	(0.496)	(0.413)
Observations	915	658	1055	798	352	546
N. Countries	137	136	140	140	32	78
R^2	–	–	0.28	0.31	0.41	0.39
N. Instruments	128	68	–	–	–	–
AR(2) test (p-value)	0.653	0.069	–	–	–	–
Hansen test (p-value)	0.330	0.034	–	–	–	–
Threshold τ	5.51	7.74	9.05	8.95	7.31	9.95
Threshold 90% CI	[2.80-8.22]	[5.03–10.45]	[8.63–9.48]	[8.30–9.58]	[7.24–7.32]	[9.91–9.96]
Threshold-effect F-test (p-value)	–	–	–	–	0.06	0.01
Country FE	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES

Notes: This table reports the results of a set of dynamic panel estimations in which the dependent variable is the average real GDP per capita growth rate. All regressions contain time and country fixed effects. The null hypothesis of the AR(2) serial correlation test is that the errors in the first difference regression exhibit no second-order serial correlation. Control variables are in logs. The null hypothesis of the Hansen test is that the instruments fail to identify the same vector of parameters. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

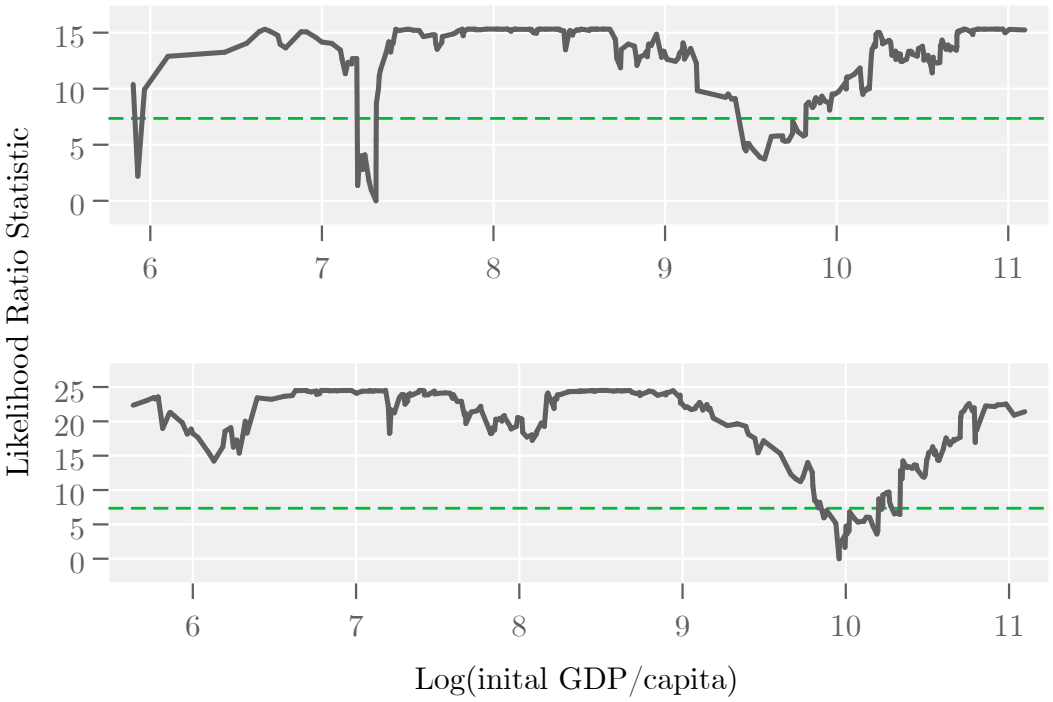

Figure A1: The LR statistic from Table A7 columns (5) and (6) is constructed as $\text{LR} = \frac{[\text{SSR}(\tau) - \text{SSR}(\hat{\tau})]}{\hat{\sigma}^2}$, where $\hat{\tau} = \arg\min \text{SSR}(\tau)$; SSR is the sum of squared residuals obtained by estimating the model for different values of the threshold variable. The green dashed line denotes the critical value (7.35) at the 95% confidence level for the LR statistic. Note that the LR statistic seems to identify several possible thresholds for the regression displayed in Table A7 column (5). For robustness, I check a multiple threshold regression based on the same setup. The single threshold model displayed in column (5) returns a F-stat of 25.07 with the associated p-value of 0.0075. In contrast, the double thresholds model returns a F-stat of 10.18 with a much higher p-value of 0.31. Therefore, I reported the single threshold estimates.

Table A8: Institution controls, Worldwide Governance Indicators from Kraay et al (2010).

1995-2015 NEW dataset DIFFERENCE-GMM	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
inital GDP/capita	2.018	1.924	1.826	-0.457	2.296	-0.056	0.486	0.302
	(3.913)	(5.181)	(4.004)	(4.870)	(3.925)	(4.779)	(3.242)	(5.269)
Private Credit	-5.130***	-4.341*	-5.133**	-3.323	-3.873*	-4.308**	-3.724*	-2.207
	(1.962)	(2.302)	(2.015)	(2.650)	(1.988)	(2.044)	(1.975)	(2.447)
School	0.130	-1.179	-0.458	0.070	-0.371	-0.206	2.102	-3.339
	(5.513)	(5.791)	(4.896)	(6.024)	(5.691)	(5.669)	(5.495)	(6.955)
Inflation rate	0.930	0.861	0.826	1.115	0.897	1.300	0.681	1.642*
	(0.598)	(0.937)	(0.527)	(0.731)	(0.655)	(0.915)	(0.553)	(0.955)
Trade openness	2.434	3.314	2.850	3.809	2.439	4.044*	0.628	4.492
	(2.184)	(3.156)	(1.882)	(2.483)	(2.272)	(2.414)	(2.437)	(4.101)
Government consumption	9.259*	8.173	9.128*	9.466**	7.517	9.770	6.576	11.315
	(4.936)	(5.684)	(4.665)	(4.466)	(4.788)	(6.349)	(4.239)	(6.970)
Worldwide Governance Index (6 dimensions)		-0.148						
		(1.115)						
Voice and Accountability			-1.109					
			(2.411)					
Political Stability and Absence of Violence/Terrorism				1.793				
				(2.321)				
Government Effectiveness					-1.738			
					(4.303)			
Regulatory Quality						2.687		
						(3.115)		
Rule of Law							-4.029	
							(2.716)	
Control of Corruption								4.804
								(4.782)
Observations	377	253	254	253	254	254	254	254
N. Countries	135	134	134	134	134	134	134	134
N. Instruments	20	20	20	20	20	20	20	20
AR(2) test p-value	0.156	.	.	.	.	.	.	.
Hansen test p-value	0.259	0.094	0.138	0.234	0.071	0.123	0.079	0.348

Notes: Set of dynamic panel estimations in which the dependent variable is the average real GDP per capita growth rate. All regressions contain time and country fixed effects. The sample starts in 1995 due to data availlability from the Worldwide Governance Indicators (Kraay et al, 2010). Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table A9: Institution interaction, Worldwide Governance Indicators from Kraay et al (2010).

1995-2015 NEW dataset DIFFERENCE-GMM	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
inital GDP/capita	2.018	2.931	1.281	1.325	0.878	1.975	0.724	2.845
	(3.913)	(4.863)	(4.169)	(4.046)	(3.949)	(4.159)	(4.655)	(4.745)
Private Credit	-5.130***	-8.605	-4.931*	-5.018**	-2.974	-7.143	-4.283	-7.325*
	(1.962)	(6.070)	(2.958)	(2.024)	(4.698)	(4.483)	(4.578)	(4.064)
School	0.130	1.570	0.925	0.932	-0.020	1.055	0.876	0.658
	(5.513)	(5.409)	(5.481)	(5.877)	(5.796)	(5.140)	(5.472)	(5.078)
Inflation rate	0.930	1.001*	0.898	0.951	1.004	0.984*	0.992*	1.043*
	(0.598)	(0.576)	(0.605)	(0.585)	(0.641)	(0.590)	(0.600)	(0.536)
Trade openness	2.434	2.526	3.095	3.136	3.044	2.096	2.939	2.402
	(2.184)	(2.441)	(2.260)	(2.217)	(2.636)	(2.395)	(2.571)	(2.373)
Government consumption	9.259*	8.880*	8.843*	8.485*	8.717*	8.753*	8.730*	9.253*
	(4.936)	(4.935)	(4.583)	(4.329)	(4.637)	(4.974)	(4.825)	(4.949)
Private Credit		0.626						
× Worldwide Governance Index		(0.842)						
Private Credit			0.707					
× Voice and Accountability			(2.662)					
Private Credit				1.815				
× Political Stability				(1.781)				
Private Credit					-0.987			
× Government Effectiveness					(2.792)			
Private Credit						2.012		
× Regulatory Quality						(2.951)		
Private Credit							0.188	
× Rule of Law							(2.653)	
Private Credit								2.588
× Control of Corruption								(2.950)
Observations	377	253	254	253	254	254	254	254
N. Countries	135	134	134	134	134	134	134	134
N. Instruments	20	20	20	20	20	20	20	20
AR(2) test p-value	0.156	.	.	.	.	.	.	.
Hansen test p-value	0.259	0.145	0.090	0.216	0.107	0.100	0.079	0.146

Notes: Set of dynamic panel estimations in which the dependent variable is the average real GDP per capita growth rate. All regressions contain time and country fixed effects. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table A10: Institution controls, Worldwide Governance Indicators from Kraay et al (2010).

1995-2015 NEW dataset OLS-FE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
inital GDP/capita	-4.614***	-6.132***	-6.612***	-7.169***	-5.603***	-5.710***	-6.154***	-6.449***
	(0.805)	(1.193)	(1.114)	(1.192)	(1.183)	(1.153)	(1.210)	(1.126)
Private Credit	-2.606***	-1.912***	-1.893***	-1.754***	-1.832***	-1.675**	-1.772***	-1.971***
	(0.515)	(0.647)	(0.646)	(0.664)	(0.657)	(0.651)	(0.660)	(0.664)
School	-0.224	0.731	0.881	1.345	0.757	0.873	0.864	0.985
	(2.515)	(3.091)	(3.078)	(2.834)	(3.116)	(3.026)	(2.996)	(3.106)
Inflation rate	-0.268**	-0.108	-0.095	-0.099	-0.106	-0.116	-0.111	-0.113
	(0.123)	(0.114)	(0.117)	(0.119)	(0.112)	(0.114)	(0.115)	(0.111)
Trade openness	0.958	1.523*	1.420	1.338	1.535*	1.463*	1.535*	1.442*
	(0.609)	(0.852)	(0.881)	(0.930)	(0.845)	(0.842)	(0.853)	(0.861)
Government consumption	0.325	0.559	0.671	0.631	0.408	0.540	0.461	0.616
	(0.686)	(0.834)	(0.807)	(0.810)	(0.811)	(0.805)	(0.814)	(0.818)
Worldwide Governance Index		-0.189						
		(0.138)						
Voice and Accountability			-0.355					
			(0.583)					
Political Stability and Absence of Violence				0.536				
				(0.425)				
Government Effectiveness					-1.712**			
					(0.657)			
Regulatory Quality						-1.587***		
						(0.481)		
Rule of Law							-1.351**	
							(0.677)	
Control of Corruption								-0.664
								(0.669)
Observations	517	392	393	392	393	393	393	393
N. Countries	140	139	139	139	139	139	139	139

Notes: This table reports the results of a set of dynamic panel estimations in which the dependent variable is the average real GDP per capita growth rate. All regressions contain time and country fixed effects. The sample starts in 1995 due to data availlability from the Worldwide Governance Indicators (Kraay et al, 2010). Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table A11: Institution interaction, Worldwide Governance Indicators from Kraay et al (2010).

1995-2015 NEW dataset OLS-FE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
inital GDP/capita	-4.614***	-6.717***	-7.008***	-6.723***	-6.715***	-6.716***	-6.570***	-6.555***
	(0.805)	(1.115)	(1.087)	(1.142)	(1.126)	(1.112)	(1.123)	(1.138)
Private Credit	-2.606***	-1.833*	-1.158	-1.976***	-1.695	-1.691*	-2.211**	-2.163**
	(0.515)	(1.090)	(0.902)	(0.728)	(1.088)	(0.996)	(1.090)	(0.969)
School	-0.224	0.933	0.682	1.051	0.926	0.918	1.047	1.003
	(2.515)	(3.124)	(3.108)	(3.147)	(3.093)	(3.101)	(3.136)	(3.101)
Inflation rate	-0.268**	-0.099	-0.110	-0.096	-0.096	-0.098	-0.098	-0.096
	(0.123)	(0.116)	(0.115)	(0.116)	(0.116)	(0.115)	(0.117)	(0.117)
Trade openness	0.958	1.385	1.428	1.361	1.358	1.357	1.317	1.320
	(0.609)	(0.920)	(0.911)	(0.923)	(0.911)	(0.907)	(0.911)	(0.908)
Government consumption	0.325	0.604	0.604	0.651	0.606	0.611	0.662	0.660
	(0.686)	(0.832)	(0.829)	(0.827)	(0.829)	(0.826)	(0.820)	(0.820)
Private Credit		-0.008						
× Worldwide Governance Index		(0.112)						
Private Credit			-0.918*					
× Voice and Accountability			(0.549)					
Private Credit				0.254				
× Political Stability				(0.414)				
Private Credit					-0.169			
× Government Effectiveness					(0.554)			
Private Credit						-0.173		
× Regulatory Quality						(0.575)		
Private Credit							0.313	
× Rule of Law							(0.594)	
Private Credit								0.304
× Control of Corruption								(0.485)
Observations	517	392	393	392	393	393	393	393
N. Countries	140	139	139	139	139	139	139	139

Notes: This table reports the results of a set of dynamic panel estimations in which the dependent variable is the average real GDP per capita growth rate. All regressions contain time and country fixed effects. The sample starts in 1995 due to data availlability from the Worldwide Governance Indicators (Kraay et al, 2010). Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table A12: Institution controls, from the Economic Freedom of the World database Gwartney et al (2008).

Estimator:	DIFF-GMM				OLS-FE			
1960-2015 NEW dataset	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
inital GDP/capita	-2.780***	-3.482***	-3.149***	-3.437***	-4.116***	-4.562***	-4.365***	-4.300***
	(0.784)	(1.010)	(0.890)	(1.016)	(0.406)	(0.484)	(0.463)	(0.459)
Private Credit	-4.423***	-2.434***	-3.615***	-3.230***	-1.108***	-1.149***	-1.166***	-1.349***
	(1.075)	(0.857)	(1.068)	(1.041)	(0.408)	(0.403)	(0.415)	(0.408)
School	-2.253***	-1.010	-1.395	-0.946	-0.932	-0.307	-0.945	-0.108
	(0.815)	(0.842)	(0.888)	(1.312)	(0.660)	(0.632)	(0.750)	(0.682)
Inflation rate	-0.202	0.123	-0.252	-0.143	-0.116	-0.109	-0.168	-0.211**
	(0.172)	(0.229)	(0.187)	(0.191)	(0.090)	(0.098)	(0.113)	(0.103)
Trade openness	1.286	1.085	1.311*	0.936	1.692***	1.662***	1.936***	2.005***
	(1.134)	(0.942)	(0.776)	(0.892)	(0.432)	(0.492)	(0.506)	(0.495)
Government consumption	-1.513*	0.451	-0.640	0.561	-0.978**	-0.928**	-0.578	-0.768
	(0.842)	(0.834)	(0.971)	(1.036)	(0.428)	(0.414)	(0.545)	(0.487)
Economic Freedom Index		0.978***				0.678***		
		(0.317)				(0.143)		
Credit market regulations			0.055				0.019	
			(0.126)				(0.066)	
Regulation				0.537*				0.228*
				(0.278)				(0.124)
Observations	915	696	734	673	1055	827	865	804
N. Countries	137	120	120	120	140	131	131	131
N. Instruments	111	116	116	116	–	–	–	
AR(2) test p-value	0.796	0.800	0.811	0.301	–	–	–	–
Hansen test p-value	0.294	0.177	0.255	0.258	–	–	–	–

Notes: This table reports the results of a set of dynamic panel estimations in which the dependent variable is the average real GDP per capita growth rate. All regressions contain time and country fixed effects. The null hypothesis of the AR(2) serial correlation test is that the errors in the first difference regression exhibit no second-order serial correlation. Control variables are in logs. The null hypothesis of the Hansen test is that the instruments fail to identify the same vector of parameters. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table A13: Institution interaction, from the Economic Freedom of the World database Gwartney et al (2008).

Estimator:	DIFF-GMM				OLS-FE			
1960-2015 NEW dataset	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
inital GDP/capita	-2.780***	-2.627***	-2.342**	-2.363**	-4.116***	-4.229***	-4.306***	-4.185***
	(0.784)	(0.895)	(1.025)	(1.115)	(0.406)	(0.461)	(0.462)	(0.453)
Private Credit	-4.423***	1.633	1.585	0.692	-1.108***	-1.411	0.817	-0.690
	(1.075)	(4.079)	(2.606)	(3.821)	(0.408)	(1.612)	(1.096)	(1.619)
School	-2.253***	-1.916*	-2.098**	-1.439	-0.932	-0.101	-1.049	-0.139
	(0.815)	(1.129)	(0.949)	(1.282)	(0.660)	(0.628)	(0.765)	(0.702)
Inflation rate	-0.202	-0.338	-0.232	-0.282	-0.116	-0.286***	-0.186*	-0.253**
	(0.172)	(0.211)	(0.188)	(0.177)	(0.090)	(0.094)	(0.103)	(0.099)
Trade openness	1.286	1.941**	1.377	1.186	1.692***	1.854***	1.934***	2.055***
	(1.134)	(0.789)	(0.850)	(0.838)	(0.432)	(0.498)	(0.488)	(0.489)
Government consumption	-1.513*	-0.713	-0.970	-0.141	-0.978**	-1.098**	-0.647	-0.867*
	(0.842)	(0.951)	(0.861)	(0.961)	(0.428)	(0.421)	(0.539)	(0.475)
Private Credit		-0.757				0.038		
× Economic Freedom Index		(0.537)				(0.213)		
Private Credit			-0.711**				-0.243**	
× Credit market regulation			(0.309)				(0.121)	
Private Credit				-0.567				-0.081
× Regulation				(0.463)				(0.195)
Observations	915	696	734	673	1055	827	865	804
N. Countries	137	120	120	120	140	131	131	131
N. Instruments	111	116	116	116				
AR(2) test p-value	0.796	0.799	0.834	0.332	–	–	–	–
Hansen test p-value	0.294	0.365	0.252	0.229	–	–	–	–

Notes: This table reports the results of a set of dynamic panel estimations in which the dependent variable is the average real GDP per capita growth rate. All regressions contain time and country fixed effects. The null hypothesis of the AR(2) serial correlation test is that the errors in the first difference regression exhibit no second-order serial correlation. Control variables are in logs. The null hypothesis of the Hansen test is that the instruments fail to identify the same vector of parameters. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table A14: Institution controls, from the Quality of Governance database Teorell et al (2020).

Estimator:	DIFF-GMM					OLS-FE				
1960-2015 NEW dataset	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
inital GDP/capita	-2.780***	-1.540	0.771	1.562	0.748	-4.116***	-5.191***	-5.369***	-5.063***	-5.242***
	(0.784)	(1.818)	(1.863)	(2.038)	(1.787)	(0.406)	(0.844)	(1.117)	(1.002)	(1.010)
Private Credit	-4.423***	-4.334**	-6.731***	-6.404***	-6.142***	-1.108***	-2.405***	-2.711***	-2.341***	-2.486***
	(1.075)	(1.842)	(1.470)	(1.653)	(1.789)	(0.408)	(0.571)	(0.617)	(0.582)	(0.650)
School	-2.253***	2.991	3.995**	2.778	4.732***	-0.932	1.795	2.741**	2.472**	2.753**
	(0.815)	(2.363)	(1.846)	(1.928)	(1.823)	(0.660)	(1.142)	(1.159)	(1.161)	(1.153)
Inflation rate	-0.202	0.136	0.447*	0.352	0.550**	-0.116	-0.276**	-0.173	-0.189	-0.177
	(0.172)	(0.251)	(0.246)	(0.261)	(0.218)	(0.090)	(0.137)	(0.138)	(0.138)	(0.138)
Trade openness	1.286	-0.101	0.036	0.791	0.164	1.692***	0.774	1.005	1.107*	1.119*
	(1.134)	(1.198)	(1.617)	(1.625)	(1.452)	(0.432)	(0.557)	(0.650)	(0.615)	(0.635)
Government consumption	-1.513*	-0.688	1.455	1.096	1.741	-0.978**	-0.191	-0.223	-0.286	-0.252
	(0.842)	(1.458)	(1.912)	(2.632)	(1.941)	(0.428)	(0.638)	(0.701)	(0.776)	(0.758)
State Fragility Index		-0.362*					-0.177**			
		(0.214)					(0.082)			
Economic Freedom Index			0.014					0.022		
			(0.089)					(0.033)		
Financial Freedom				-0.036					-0.019*	
				(0.024)					(0.010)	
Investment Freedom					-0.015					-0.004
					(0.026)					(0.009)
Observations	915	340	312	312	312	1055	472	447	447	447
N. Countries	137	125	126	126	126	140	132	135	135	135
N. Instruments	111	41	41	41	41	–	–	–	–	–
AR(2) test p-value	0.796	0.963	0.369	0.410	0.296	–	–	–	–	–
Hansen test p-value	0.294	0.056	0.058	0.089	0.102	–	–	–	–	–

Notes: This table reports the results of a set of dynamic panel estimations in which the dependent variable is the average real GDP per capita growth rate. All regressions contain time and country fixed effects. The null hypothesis of the AR(2) serial correlation test is that the errors in the first difference regression exhibit no second-order serial correlation. Control variables are in logs. The null hypothesis of the Hansen test is that the instruments fail to identify the same vector of parameters. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table A15: Institution interactions, from the Quality of Governance database Teorell et al (2020).

Estimator:	DIFF-GMM					OLS-FE				
1960-2015 NEW dataset	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
inital GDP/capita	-2.780***	0.118	0.424	0.270	0.618	-4.116***	-4.732***	-5.318***	-5.453***	-5.370***
	(0.784)	(1.622)	(2.059)	(2.027)	(1.989)	(0.406)	(0.828)	(0.997)	(0.966)	(0.961)
Private Credit	-4.423***	-6.368***	-5.610	-3.336	-6.448	-1.108***	-2.596***	-0.906	-0.647	-1.760
	(1.075)	(1.985)	(8.020)	(4.083)	(4.589)	(0.408)	(0.562)	(2.913)	(1.260)	(1.326)
School	-2.253***	5.463**	4.094**	3.161	3.667*	-0.932	2.506**	2.688**	2.606**	2.711**
	(0.815)	(2.195)	(1.884)	(2.188)	(2.109)	(0.660)	(1.115)	(1.169)	(1.163)	(1.149)
Inflation rate	-0.202	0.081	0.557**	0.418	0.519*	-0.116	-0.261*	-0.183	-0.183	-0.183
	(0.172)	(0.308)	(0.268)	(0.277)	(0.271)	(0.090)	(0.136)	(0.137)	(0.136)	(0.137)
Trade openness	1.286	-0.038	0.811	0.519	1.108	1.692***	0.938*	1.091*	0.995	1.116*
	(1.134)	(1.245)	(1.573)	(1.665)	(1.734)	(0.432)	(0.559)	(0.632)	(0.616)	(0.638)
Government consumption	-1.513*	-0.299	1.532	1.288	1.803	-0.978**	-0.108	-0.286	-0.298	-0.243
	(0.842)	(1.932)	(2.187)	(2.124)	(2.806)	(0.428)	(0.688)	(0.752)	(0.742)	(0.743)
Private Credit × State Fragility Index		-0.077					0.038			
		(0.384)					(0.117)			
Private Credit × Economic Freedom Index			-0.007					-0.023		
			(0.104)					(0.036)		
Private Credit × Financial Freedom				-0.039					-0.025*	
				(0.048)					(0.014)	
Private Credit × Investment Freedom					0.000					-0.010
					(0.055)					(0.013)
Observations	915	340	312	312	312	1055	472	447	447	447
N. Countries	137	125	126	126	126	140	132	135	135	135
N. Instruments	111	41	41	41	41	–	–	–	–	–
AR(2) test p-value	0.796	0.514	0.325	0.320	0.422	–	–	–	–	–
Hansen test p-value	0.294	0.032	0.083	0.056	0.100	–	–	–	–	–

Notes: This table reports the results of a set of dynamic panel estimations in which the dependent variable is the average real GDP per capita growth rate. All regressions contain time and country fixed effects. The null hypothesis of the AR(2) serial correlation test is that the errors in the first difference regression exhibit no second-order serial correlation. Control variables are in logs. The null hypothesis of the Hansen test is that the instruments fail to identify the same vector of parameters. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table A16: Financial development growth effects with regions.

	GMM-Difference				OLS-FE			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dataset	Old	Old	New	New	Old	Old	New	New
Period	1960-2010	1980-2010	1960-2015	1980-2015	1960-2010	1980-2010	1980-2015	1990-2015
inital GDP/capita	-2.828***	-3.747**	-4.006***	-5.791***	-3.648***	-5.809***	-7.143***	-7.554***
	(1.032)	(1.508)	(0.967)	(1.434)	(0.545)	(0.662)	(0.888)	(1.044)
Private Credit	-4.941***	-7.872***	-5.542***	-8.394***	-2.280***	-2.894***	-2.125***	-3.132***
	(1.259)	(2.016)	(1.206)	(2.081)	(0.477)	(0.692)	(0.670)	(0.756)
Private Credit	1.807	-0.274	1.733	2.810	1.613**	0.829	2.495**	1.726
× Medium-high income countries	(2.311)	(5.094)	(2.064)	(2.472)	(0.794)	(1.029)	(0.978)	(1.853)
Private Credit	12.515**	15.961***	3.037	6.896	4.169***	5.375***	5.868***	6.388***
× Medium-low & Low income countries	(5.731)	(6.130)	(3.374)	(4.756)	(1.528)	(1.292)	(1.745)	(2.419)
School	-3.343**	-2.285	-3.958***	-5.573**	-2.252***	-2.069**	-1.104	0.840
	(1.412)	(2.053)	(1.134)	(2.236)	(0.665)	(0.933)	(0.899)	(1.008)
Government consumption	-0.910	-0.060	-1.293	-1.139	-1.853***	-1.562***	-0.988*	-0.482
	(0.996)	(1.046)	(0.891)	(1.092)	(0.471)	(0.505)	(0.556)	(0.614)
Trade openness	3.435***	3.166	1.072	2.476**	2.303***	2.057***	1.654***	1.231**
	(1.131)	(1.946)	(0.939)	(1.201)	(0.503)	(0.423)	(0.414)	(0.549)
Inflation rate	-0.306	-0.326	-0.215	-0.194	-0.214**	-0.325***	-0.261**	-0.203**
	(0.187)	(0.278)	(0.179)	(0.245)	(0.102)	(0.108)	(0.109)	(0.101)
Observations	784	527	915	658	917	660	666	487
N. Countries	130	130	137	136	133	133	136	135
R^2	–	–	–	–	0.28	0.35	0.33	0.32
N. Instruments	129	61	132	78				
AR(2) test (p-value)	0.264	0.078	0.864	0.195				
Hansen test (p-value)	0.262	0.693	0.511	0.076				

Notes: This table reports the results of a set of dynamic panel estimations in which the dependent variable is the average real GDP per capita growth rate. All regressions contain time and country fixed effects. While the first four columns present Difference-GMM estimations with the instruments set restricted to one lag, the subsequent columns report OLS fixed effect regressions. The null hypothesis of the AR(2) serial correlation test is that the errors in the first difference regression exhibit no second-order serial correlation. Control variables are in logs. The null hypothesis of the Hansen test is that the instruments fail to identify the same vector of parameters (see Parentes and Silva, 2012). Robust Windmeijer standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table A17: Financial development growth effects controlling for banking crises (Laeven and Valencia, 2018).

	GMM-Difference				OLS-FE			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dataset	Old	Old	New	New	Old	Old	New	New
Period	1960-2010	1980-2010	1960-2015	1980-2015	1960-2010	1980-2010	1980-2015	1990-2015
inital GDP/capita	-2.384*	-3.524	-3.431***	-3.161**	-3.688***	-5.263***	-6.482***	-6.887***
	(1.217)	(2.336)	(0.858)	(1.524)	(0.554)	(0.663)	(0.896)	(1.089)
Private Credit	-2.874**	-3.049*	-4.764***	-5.253***	-1.355***	-1.870***	-1.678***	-1.851***
	(1.182)	(1.586)	(1.121)	(1.972)	(0.433)	(0.591)	(0.525)	(0.689)
Systemic Banking Crisis	-1.906***	-1.935**	-2.534***	-1.917***	-1.232***	-1.201***	-1.285***	-0.832***
	(0.651)	(0.882)	(0.485)	(0.726)	(0.238)	(0.273)	(0.258)	(0.257)
School	-1.920	-1.009	-4.100***	-2.241	-1.882***	-1.624*	-0.656	0.965
	(1.187)	(3.148)	(1.022)	(2.855)	(0.662)	(0.892)	(0.869)	(1.068)
Government consumption	-0.951	-0.745	-2.146***	-1.946*	-1.620***	-1.412***	-0.934	-0.420
	(0.945)	(1.196)	(0.802)	(1.069)	(0.507)	(0.506)	(0.571)	(0.661)
Trade openness	3.481***	3.505	1.373	0.374	2.417***	1.844***	1.455***	1.022*
	(1.117)	(2.395)	(0.979)	(1.171)	(0.560)	(0.443)	(0.412)	(0.540)
Inflation rate	-0.238	-0.262	-0.138	-0.204	-0.152	-0.318***	-0.258**	-0.225**
	(0.229)	(0.344)	(0.146)	(0.190)	(0.106)	(0.109)	(0.106)	(0.108)
Observations	739	527	915	658	872	660	666	487
N. Countries	130	130	137	136	133	133	136	135
R^2	–	–	–	–	0.29	0.35	0.37	0.32
N. Instruments	107	54	122	69				
AR(2) test p-value	0.301	0.173	0.753	0.200	–	–	–	–
Hansen test p-value	0.441	0.060	0.504	0.062	–	–	–	–

Notes: This table reports the results of a set of dynamic panel estimations in which the dependent variable is the average real GDP per capita growth rate. All regressions contain time and country fixed effects. While the first four columns present Difference-GMM estimations with the instruments set restricted to one lag, the subsequent columns report OLS fixed effect regressions. The null hypothesis of the AR(2) serial correlation test is that the errors in the first difference regression exhibit no second-order serial correlation. Control variables are in logs. The null hypothesis of the Hansen test is that the instruments fail to identify the same vector of parameters (see Parentes and Silva, 2012). Robust Windmeijer standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table A18: Financial development growth effects controlling for financial liberalization (Abiad et al, 2010).

	GMM-Difference				OLS-FE			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dataset	Old	Old	New	New	Old	Old	New	New
Period	1960-2010	1980-2010	1960-2015	1980-2015	1960-2010	1980-2010	1980-2015	1990-2015
inital GDP/capita	-2.935	-0.852	-4.060***	-3.321	-4.035***	-4.901***	-5.425***	-6.426***
	(2.094)	(2.751)	(1.414)	(2.766)	(0.771)	(0.796)	(0.790)	(1.438)
Private Credit	-2.941**	-8.030***	-6.823***	-8.057***	-1.564**	-2.285***	-1.877***	-2.780***
	(1.445)	(2.824)	(1.816)	(2.834)	(0.598)	(0.641)	(0.530)	(0.661)
Financial Reform Index	4.182**	3.923	1.682	0.609	2.869***	2.109*	2.036**	3.178***
	(1.769)	(2.994)	(1.795)	(2.350)	(0.956)	(1.078)	(0.872)	(0.974)
School	-2.035*	-6.561*	-3.479**	-2.210	-1.519	-1.865**	0.100	0.263
	(1.155)	(3.584)	(1.622)	(3.410)	(0.930)	(0.931)	(0.814)	(1.136)
Government consumption	-1.947*	-2.814**	-1.592	-2.122*	-2.190***	-2.736***	-1.579***	-1.223*
	(1.166)	(1.163)	(1.165)	(1.185)	(0.701)	(0.682)	(0.461)	(0.640)
Trade openness	3.225***	0.956	1.489	1.092	1.987***	2.447***	1.599***	1.601**
	(1.046)	(1.297)	(1.589)	(1.492)	(0.586)	(0.465)	(0.535)	(0.749)
Inflation rate	0.001	-0.373	-0.087	-0.158	-0.141	-0.435***	-0.270*	-0.191
	(0.221)	(0.447)	(0.230)	(0.260)	(0.144)	(0.149)	(0.149)	(0.145)
Observations	319	263	410	350	400	344	431	308
N. Countries	79	79	81	81	81	81	81	81
R^2	–	–	–	–	0.32	0.40	0.35	0.33
N. Instruments	72	39	87	54	–	–	–	–
AR(2) test p-value	0.230	0.114	0.549	0.200	–	–	–	–
Hansen test p-value	0.249	0.159	0.380	0.052	–	–	–	–

Notes: This table reports the results of a set of dynamic panel estimations in which the dependent variable is the average real GDP per capita growth rate. All regressions contain time and country fixed effects. While the first four columns present Difference-GMM estimations with the instruments set restricted to one lag, the subsequent columns report OLS fixed effect regressions. The null hypothesis of the AR(2) serial correlation test is that the errors in the first difference regression exhibit no second-order serial correlation. Control variables are in logs. The null hypothesis of the Hansen test is that the instruments fail to identify the same vector of parameters (see Parentes and Silva, 2012). Robust Windmeijer standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table A19: Institution interactions, from the Financial Reform database Abiad et al (2010).

	GMM-Difference				OLS-FE			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dataset	Old	Old	New	New	Old	Old	New	New
Period	1960-2010	1980-2010	1960-2015	1980-2015	1960-2010	1980-2010	1980-2015	1990-2015
inital GDP/capita	-2.839*	-0.886	-4.058***	-3.593	-4.030***	-4.907***	-5.439***	-6.418***
	(1.506)	(2.967)	(1.350)	(2.626)	(0.774)	(0.799)	(0.801)	(1.467)
Private Credit	-1.910	-9.405**	-3.308	-5.115	-0.897	-1.884	0.469	-2.934
	(1.758)	(3.872)	(3.535)	(4.461)	(1.017)	(1.145)	(1.200)	(1.859)
Financial Reform Index	3.708***	2.767	1.985	0.780	3.067***	2.221**	2.483***	3.158***
	(1.274)	(3.024)	(1.641)	(2.468)	(0.970)	(1.075)	(0.890)	(0.992)
Private Credit × Financial Reform Index	-1.567	2.080	-3.473	-0.556	-0.853	-0.488	-2.735*	0.174
	(1.988)	(4.061)	(3.177)	(4.074)	(1.085)	(1.252)	(1.400)	(1.926)
School	-2.673**	-5.583*	-3.928**	-0.380	-1.695*	-1.944**	-0.307	0.277
	(1.067)	(3.349)	(1.601)	(2.872)	(0.931)	(0.950)	(0.859)	(1.112)
Government consumption	-2.085**	-2.910***	-1.608	-1.805*	-2.187***	-2.740***	-1.565***	-1.221*
	(0.913)	(1.107)	(1.260)	(1.074)	(0.701)	(0.681)	(0.465)	(0.641)
Trade openness	2.746***	1.202	0.759	2.127	1.937***	2.418***	1.442***	1.604**
	(0.934)	(1.471)	(1.402)	(1.529)	(0.594)	(0.477)	(0.534)	(0.755)
Inflation rate	-0.101	-0.462	-0.023	-0.192	-0.138	-0.429***	-0.256*	-0.192
	(0.215)	(0.463)	(0.211)	(0.262)	(0.145)	(0.149)	(0.153)	(0.146)
Observations	319	263	410	350	400	344	431	308
N. Countries	79	79	81	81	81	81	81	81
R^2	–	–	–	–	0.32	0.40	0.35	0.33
N. Instruments	79	44	96	61				
AR(2) test p-value	0.261	0.093	0.489	0.114	–	–	–	–
Hansen test p-value	0.347	0.372	0.780	0.068	–	–	–	–

Notes: This table reports the results of a set of dynamic panel estimations in which the dependent variable is the average real GDP per capita growth rate. All regressions contain time and country fixed effects. While the first four columns present Difference-GMM estimations with the instruments set restricted to one lag, the subsequent columns report OLS fixed effect regressions. The null hypothesis of the AR(2) serial correlation test is that the errors in the first difference regression exhibit no second-order serial correlation. Control variables are in logs. The null hypothesis of the Hansen test is that the instruments fail to identify the same vector of parameters (see Parentes and Silva, 2012). Robust Windmeijer standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.