Finance and Income Inequality:

Test of Alternative Theories

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Abstract: Although theoretical models make distinct predictions about the relation between financial sector development and income inequality, little empirical research has been conducted to compare their relative explanatory power. We examine the relation between financial intermediary development and income inequality in a panel data set of 91 countries for the period of 1960-95. Our results provide evidence that inequality decreases as economies develop their financial intermediaries, consistent with the theoretical models in Galor and Zeira (1993) and Banerjee and Newman (1993). Moreover, consistent with the insight of Kuznets, the relation between the Gini coefficient and financial intermediary development appears to depend upon the sectoral structure of the economy: a larger modern sector is associated with a smaller drop in the Gini coefficient for the same level of financial intermediary development. However, there is no evidence of an inverted-U shaped relation between financial sector development and income inequality, as suggested by Greenwood and Jovanovic (1990). The results are robust to controlling for biases introduced by simultaneity.

JEL Classification: D3, G2, O1
Keywords: Income inequality; financial intermediary development; Kuznets curve

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I. INTRODUCTION

Economists have been concerned about the distribution of income for a long time. Kuznets (1955), which is perhaps the seminal study on the distribution of income, argued that economic development is associated first with an increase and then a decrease in income inequality, resulting in an inverted u-shaped relationship between the two variables. In the 1990s, economists started to consider the link between financial sector development and income inequality. Building on the Kuznets' hypothesis, Greenwood and Jovanovic (1990) show how the interaction of financial and economic development can give rise to an inverted u-shaped relationship between income inequality and financial intermediary development. Other models, however, have shown that financial market imperfections can perpetuate the initial distribution of wealth in the presence of indivisible investments (Banerjee and Newman, 1993; Galor and Zeira, 1993), suggesting a negative relationship between the two. While the recent empirical literature has established a positive impact of financial development on economic growth, less is known about the empirical link between finance and income distribution.[1]

This paper analyzes the relationship between income distribution and financial intermediary development using panel data from both developing and developed countries between 1960 and 1995, Specifically, we analyze whether financial intermediary development has an impact on income inequality and whether this impact depends on the level of financial intermediary development or the sectoral structure of the economy, as implied by alternative

[1] For the relationship between financial development and growth see, among others, Beck *et al*. (2000b), Levine *et al*. (2000) and Rousseau and Wachtel (2000). In addition, see Li *et al*. (1998), and Li *et al*. (2000) for the relationship between income inequality and financial sector development. None of these papers aims to test for the

existing theories. We allow for a non-linear relationship between financial sector development and income inequality. Since causation could run either from financial sector development to inequality or from initial inequality to financial sector development, we attempt to allow for endogeneity using instruments for financial sector development suggested in the financial sector development-growth literature (see, for example, Levine, 1997b, 1999).

The empirical investigation yields several results. First, on average there appears to be a negative relationship between financial sector development and income inequality. This is consistent with the conjecture in Banerjee and Newman (1993) and Galor and Zeira (1993). Second, we find little evidence to support the Greenwood-Jovanovic hypothesis of an inverted u-shaped relationship between inequality and finance. Third, consistent with insights based on Kuznets (1955), sectoral structure appears to affect how financial intermediaries impact inequality. In particular, the inequality-reducing effects of financial intermediaries is muted in countries with larger modern (i.e., non-agricultural) sectors.

The relationship between financial development and income distribution is important for policy makers. While recent work has established a robust link between financial sector development and economic growth, policy makers are also interested in the distribution of the benefits of accelerated growth. Moreover, given concerns about income distribution *per se*, a policymaker faced with certain policy options may wish to know how policies affect both growth and income distribution. Finally, it is important for policy makers to know whether finance can be used as an instrument to affect income inequality and in what context it might be useful in doing so.

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distinct implications of alternative existing theories regarding income distribution and financial sector development,

The remainder of the paper is organized as follows. We review the theoretical literature on the relationship between income inequality and financial sector development in section 2 and discuss the data that we use to test the theoretical hypotheses in section 3. After discussing the empirical model specification and some estimation issues in section 4, we present empirical results in section 5 and conclude in section 6.

II. THEORETICAL PERSPECTIVES ON FINANCE AND INEQUALITY

Several recent models suggest that capital market imperfections might affect income inequality during economic development. For example, Greenwood and Jovanovic (1990) present a theoretical model in which financial development fosters economic development, which, in turn, facilitates necessary investment in financial infrastructure. In their model, agents operate the more profitable, but more risky, of two technologies only when they can diversify risk by investing in financial intermediary coalitions. However, the fixed costs (e.g., membership fees) associated with these coalitions prevent low-income individuals from joining them. Assuming that poor individuals save less, and thus accumulate wealth more slowly, income differences between (high-income) members of intermediary coalitions and (low-income) outsiders will widen, resulting in an increase in income inequality. However, since the entrance fee is fixed, all agents eventually join these coalitions, resulting in an eventual reversal in the upward trend. Consequently, Greenwood and Jovanovic's (1990) model predicts an inverted u-shaped relationship between income inequality and financial sector development, with income inequality first increasing and then decreasing – before eventually stabilizing – as more people join financial coalitions (the *inverted u-shaped hypothesis).*

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as intended by this paper.

Contrary to Greenwood and Jovanovic (1990), Banerjee and Newman (1993) and Galor and Zeira (1993) suggest that long-run convergence in the income levels of rich and poor will not necessarily happen in economies with capital market imperfections *and* indivisibilities in investment in human or physical capital. Depending on the initial wealth distribution, income inequality might persist. Galor and Zeira (1993) construct a two-sector model with bequests between generations, where agents who make an indivisible investment in human capital can work in a skill-intensive sector. However, given capital market imperfections, only individuals with bequests larger than the investment amount or who can borrow will be able to make this investment. This results in income inequality that is perpetuated through bequests to the next generation. In their model, an economy with capital market imperfections and an initially unequal distribution of wealth will maintain this inequality and grow more slowly than a similar economy with a more equitable initial distribution of wealth. Similarly, Banerjee and Newman (1993) construct a three-sector model, in which two of the technologies require indivisible investment. Due to capital market imperfections, only rich agents can borrow enough to run these indivisible, higher-return technologies. Once again, the initial distribution of wealth has long-run effects on income distribution and growth. Holding all else equal, these models suggest that countries with larger capital market imperfections (i.e. higher hurdles to borrow funds to finance indivisible investment) should have higher income inequality. Consequently, we should observe a negative relationship between financial development and income inequality (the *linear hypothesis)*.

The predictions of these models can also be combined with the insights of Kuznets (1955) to suggest potential links between the sectoral structure of the economy, financial sector development, and income inequality. Focusing on the transition from agriculture to industry,

Kuznets (1955) conjectured that there might be an inverted u-shaped relationship between income inequality and economic development. As people move from the low-income, but more egalitarian, agricultural sector to the high-income, but less egalitarian, industrial sector, income inequality initially increases. However, as the agricultural sector shrinks and agricultural wages increase, this trend reverses and income inequality decreases.[2] More general models involving a traditional sector with a simple technology and a modern sector that employs an advanced technology that requires familiarization and possibly re-education before adoption can make similar predictions (Aghion and Howitt, 1998; Helpman, 1998). Since only a minority of people initially benefit from the higher income possibilities in the modern sector, income inequality increases at the initial stage of economic development. However, as more people adopt the new technology, and as new entrants catch up with those who started earlier, this reverses and income inequality starts to fall.

Financial sector development might affect income inequality if agents require access to finance in order to migrate to the modern sector. Since, as suggested by Kuznets (1955), income inequality is likely to be higher in the modern sector (industry and services), and if entry into this sector is made easier when it is easier to gain access to finance, inequality will be greater in economies with larger modern sectors. Further, if highly talented individuals can garner larger rewards in the modern sector, these individuals might be able to gain especially large rewards when they have easier access to finance, resulting in greater within-sector income inequality in the modern sector than would have been possible in the traditional sector. Consequently, inequality will be higher in countries with large modern sectors and greater financial depth than

[2] See also the analysis by Lewis (1954) and Todaro (1969) who formally model the idea.

in countries with only one (or neither) of these characteristics. In other words, holding constant the direct impact of financial sector development on inequality, the coefficient on an interaction term between financial depth and the size of the modern sector would be positive. We thus arrive at the *augmented Kuznets hypothesis: sector structure will affect how financial depth impacts inequality. In particular, we expect a positive interaction between financial depth and the importance of the modern sector (as characterized by industry and service sectors).*

Theory thus makes different predictions about the relation between financial intermediaries and income inequality. In the following, we use data from a broad cross-section of countries between 1960 and 1995 to assess the empirical validity of the different hypotheses.

III. DATA

This section describes our indicators and data for financial intermediary development and income inequality as well as the set of conditioning information. Table 1 presents descriptive statistics and correlations.[3] The income inequality data are based on a new data set of Gini coefficients compiled by Deininger and Squire (1996) and extended by Lundberg and Squire (2000). While the original data set contained over 2,600 observations, Deininger and Squire (1996) and Lundberg and Squire (2000) limited the data set by imposing several quality conditions. First, all observations had to be from national household surveys for expenditure or

[3] The sample includes Australia, Austria, Belgium, Brazil, Canada, Chile, Colombia, Germany, Denmark, Ecuador, Egypt, Spain, Finland, France, United Kingdom, Greece, Hong Kong (China), Indonesia, India, Ireland, Italy, Jordan, Japan, Kenya, Korea, Sri Lanka, Mexico, Malaysia, Nigeria, Netherlands, Norway, New Zealand, Pakistan, Peru, Philippines, Portugal, Singapore, Sweden, Thailand, Turkey, United States of America, Venezuela, South Africa, Zimbabwe

income. Second, the coverage had to be representative of the national population. Third, all sources of income and uses of expenditure had to be accounted for, including own consumption.[4]

To explore whether there is an inverted U-shaped relation between economic development and income inequality, as proposed by Kuznets, we regress the logarithm of the Gini coefficient on the log of real per capita GDP and its square. Figure 1 shows the result for the panel sample. The graph suggests the existence of an inverted U-shaped curve. However, this graph does not control for alternate explanations of income inequality, such as financial depth.

The recent literature on the relationship between financial intermediary development and economic growth has developed several indicators to proxy for the ability of financial intermediaries to identify profitable projects, monitor and control managers, ease risk management and facilitate resource mobilization. We concentrate on credit to the private sector by financial intermediaries over GDP (private credit). This indicator, which comprises credits to private firms and households from banks and non-bank financial intermediaries (but which excludes central banks as lenders and government and state-owned enterprises as borrowers), seems a good proxy variable for the extent to which private sector agents have access to financial intermediation (as in Greenwood and Jovanovic, 1990), or access to loans (as in Banerjee and Newman, 1993; Galor and Zeira, 1993). Many recent studies have shown that growth is faster in countries where private credit is higher (see, for example, Beck *et al.*, 2000b; Levine *et al.*, 2000). To assess the robustness of our results, we also use an alternative measure of financial

[4] To account for different sampling methods, we adjust the data using a method suggested by Deininger and Squire (1996), and also applied by Li *et al*. (1998) and Lundberg and Squire (2000). Specifically, Deininger and Squire

intermediary development – claims on the non-financial domestic sector by deposit money banks divided by GDP (bank assets). In contrast to private credit, this measure excludes credits by non-bank financial intermediaries but includes credits to governments and state-owned enterprises.

Our sample shows a large variation in financial intermediary development. Private credit ranges from 5% of GDP in Chile (1970-75) to over 200% in Japan (1990-95). The two indicators of financial intermediary development are positively and significantly correlated (see Table 1). The pairwise correlations indicate that income inequality is lower in countries with deeper financial markets; both indicators of financial sector development are significantly and negatively correlated with the Gini coefficient. To visualize the relation between the Gini coefficient and financial intermediary development, Figure 2 plots the logarithm of the Gini coefficient and the fitted value from the regression of the logarithm of the Gini Coefficient on the logarithm of private credit against the logarithm of private credit. The plot in Figure 2 suggests a negative, and possible non-linear, relationship between financial sector development and income inequality.

IV. EMPIRICAL FRAMEWORK

To further explore the relationship between financial intermediary development and income inequality, we estimate the following regression.

$$\ln(\text{Gini Coef.}_{it}) = a_0 + f(Finance_{it}) + a_2 CV_{it} + e_{it} \qquad (1)$$

(1996) find a systematic difference of 6.6 points between the means of income-based and expenditure-based Gini coefficients. We therefore add 6.6 points to the expenditure-based Gini coefficients.

As discussed previously, bank assets or claims on the private sector by financial institutions (private credit) – both as a share of GDP – are the measures of financial sector development used in this study. The focus of the analysis is *f(Finance $_{it}$)* which, based upon the discussion of theoretical models linking income distribution to financial sector development, we assume has the following functional form:

$$a_{11}Finance_{it} + a_{12}Finance_{it}^{2} + a_{13}Finance_{it} * Modern_{it}$$

Modern is value added in industry and services (i.e., non-agricultural) sectors over GDP. The *linear hypothesis* predicts $\alpha_{11}<0$ and $\alpha_{12}=0$, but makes no predictions about α_{13}. The *inverted u-shaped hypothesis* predicts $\alpha_{11}>0$ and $\alpha_{12}<0$, but again makes no predictions about α_{13}. The a*ugmented Kuznets hypothesis* predicts $\alpha_{13}>0$.

In addition to the financial sector variables, we include several variables to control for other factors that might affect inequality. Specifically, we include linear and squared terms of the log of (initial) real per capita GDP to control for a direct "Kuznets-effect" of economic development on income inequality that is independent of any effect of financial intermediary development. We also include the inflation rate conjecturing that monetary instability hurts the poor and the middle class relatively more than the rich, because the latter have better access to financial instruments that allow them to hedge their exposure to inflation.[5] We therefore expect inflation to have a positive coefficient. Finally, we include measures of government consumption, ethno-linguistic fractionalization and a measure of the protection of property rights (the risk of expropriation). We might expect income inequality to be higher in countries where

[5] See, for example, Easterly and Fischer (2001).

ethnic fractionalization is greater if, for example, people are averse to redistribution in countries where ethnic diversity is greater.[6] It is less clear whether government consumption and the property rights protection will increase or decrease income inequality. For example, although the protection of property rights might protect the rich against expropriation by the poor, it could also have the opposite effect (i.e., protecting the poor against exploitation by the rich). Similarly, if most redistribution through the tax and transfer system is towards low-income groups, government consumption might result in greater equality. However, it could also have the opposite effect if rich households use their greater political power to exploit the poor. Since Kuznets (1955) argues that income inequality depends on the sectoral structure of an economy, we include a variable representing the share of value-added accounted for by services and industry (as opposed to agriculture). The correlation of the modern (i.e., non-agricultural sector) share of GDP and GDP per capita indicates that richer countries have smaller agricultural sectors. Although the simple correlation between the modern sector's share of GDP and the Gini coefficient is negative, this appears to be because poorer countries have greater inequality and larger agricultural sectors. After controlling for per capita income, the partial correlation becomes positive and significant.

Following the convention of the vast majority of cross-country empirical studies, we split the sample period 1960-95 into seven non-overlapping 5-year periods. We use 5-year periods rather than shorter time spans because while financial intermediary data are available on a yearly basis for most countries in our sample, they might be subject to business cycle fluctuations, which we can control for by averaging over longer time periods. To take account of the panel

[6] Consistent with this Alesina *et al*. (1999) find that spending on productive public goods (e.g., on schools) is lower in US cities where ethnic diversity is greater.

structure of the data, we considered using random or fixed effects estimators. However, in this case it is not clear that fixed effects estimation would be appropriate. The major problem is that the fixed-effects estimator, which focuses on within-country variation of financial development and income inequality, might seriously exacerbate problems related to measurement error (Griliches and Hausman, 1986). Since income inequality tends to change relatively slowly over time and is often poorly measured, it is likely that measurement error would be a significant problem in fixed-effects estimation.[7] We did, however, estimate the model allowing for random effects. The results from this estimation were very similar in terms of size and statistical significance to the results from OLS.[8]

Estimating equation (1) with Ordinary Least Squares (OLS) would introduce various biases since OLS does not allow for the possibility of reverse causality—that is, for the possibility that inequality affects the provision of financial services—something suggested in some of the theoretical models. For example, in Greenwood and Jovanovic's (1990) model, the initial distribution of wealth affects who is able to join financial intermediary coalitions and, therefore, might affect the size of the financial sector. Since we are primarily interested in the effect of financial sector development on income inequality, we use an instrumental variables approach – adopting instruments for financial sector development similar to the ones used in Levine (1997b; 1999), which assesses the exogenous impact of financial intermediary development on economic growth. The instruments are a set of dummy variables proposed by

[7] Further, as noted by Easterly (2002), it is unclear whether standard panel methods are appropriate given that income distribution is relatively stable over time.
[8] Results are available from authors upon request.

La Porta *et al*. (1998) that identify the origin of the country's legal system.[9] We use the legal origin dummy variables, rather than the measures of creditor rights, also proposed by La Porta *et al*. (1998), because they are available for a wider sample of countries. Several papers have shown that differences in legal origins are significantly related to financial sector development, perhaps because different legal traditions put different levels of emphasis on the rights of property owners or because some systems are more adaptable to exogenous changes than others.[10] In the empirical analysis, we examine the validity of the instruments using Hansen's J-test to test the over-identifying restrictions.[11]

V. EMPIRICAL RESULTS

V.1 Main Results

To test the *linear hypothesis* suggested by Galor and Zeira (1993) and Banerjee and Newman (1993), we regress the natural log of the Gini coefficient on linear terms for the two measures of financial sector development, private credit and bank assets, and the additional control variables. Before we control for the possible endogeneity of the measures of financial sector development, the results are not consistent across the two measures (see column 1 of Table 2 for private credit and column 1 of Table 3 for bank assets). The coefficient on private

[9] The measures of legal origin were taken from the Global Development Network Growth Database produced by William Easterly and Mirvat Sewadeh (see Easterly, 2001).

[10] Beck *et al*., (2001) provide an excellent summary of much of the empirical and theoretical literature on this topic. La Porta *et al*. (1998) show that protection for corporate shareholders and creditors are strongest in common law countries and weakest in French Civil Law countries. La Porta *et al*. (1997) relates these variables to some measures of capital market development (external market capitalization over GDP, number of listed firms per capita, initial public offerings), showing that they are generally lower in civil law (especially French Civil law) countries than in common law countries. Beck *et al*. (2001) shows that private credit is lower in French Civil law countries than in German Civil law and Common law countries.

[11] In similar regressions of financial sector development on economic growth, Levine (1997b; 1999) fails to reject the null hypothesis that the over-identifying restrictions are valid.

credit is statistically significant and positive when private credit is used as the measure of financial sector development, while the coefficient on bank assets is statistically significant but negative when bank assets is used as the measure of financial sector development.

However, after controlling for endogeneity using the indicators of legal origin as instruments (see Section IV), the coefficients on both variables are negative and statistically significant, suggesting that financial sector development reduces income inequality. We are unable to reject the null hypothesis that the legal origin dummies are uncorrelated with the error term after controlling for the other control variables, suggesting that they are appropriate instruments (see Hansen J-Stats in Table 2 and Table 3). Based upon the coefficient estimates in column 1, a 1 percent increase in private credit or bank assets results in about a 0.25 percent decrease in the Gini coefficient. To test the inverted u-shaped hypothesis, we include a squared term for the measures of financial sector development (see column 5). Since the coefficient on the squared term is never statistically significant in any model specification, the results fail to provide any support for this hypothesis.

After controlling for endogeneity for the financial sector variables, many of the coefficients on the other control variables are statistically insignificant (see column 4 of Table 2 and Table 3). However, the coefficients on both the linear and squared terms for initial GDP per capita are statistically significant. The positive coefficient on the linear term and the negative coefficient on the squared term suggest an inverted u-shape, with income inequality increasing with income at low levels of income and decreasing at high levels. Based upon the coefficients in column 4 of Table 2, the turning point is at about $2350. When private credit is used as the measure of financial sector development, the coefficient on government consumption is statistically significant and negative, suggesting that income inequality might be lower in

countries with higher government spending. However, this final result is not robust to using bank assets as the measure of financial sector development (see Table 3).

Finally, the results appear to provide some support for the Kuznets' hypothesis that income inequality increases during the transition from agriculture to industry. After controlling for other factors that might affect income inequality, including per capita income and financial sector development, the coefficient on the share of the economy accounted for by services and industry (i.e., sectors other than agriculture) is positive and statistically significant. This suggests that income inequality is lower in countries where agriculture accounts for a greater share of GDP.

To test the *augmented Kuznets' hypothesis* that financial sector development might have a greater effect on income inequality in countries with smaller modern sectors, we include an interaction between value added in industry and services and the measures of financial sector development. Consistent with this hypothesis, the coefficient on the interaction between finance and value-added in the modern (i.e., non-agricultural) sector of the economy is positive when either bank assets or private credit is used as the measure of financial sector development (see column 6 in Table 2 and Table 3). However, it is statistically significant only when private credit is used as the measure of financial sector development. Based upon the point estimates of the coefficients in column 6 of Table 2, financial sector development reduces income inequality so long as the modern sector accounts for less that 99.6 percent of GDP – slightly lower that the maximum value observed in the sample. At the sample mean for value added in the modern sector (87.4 percent of GDP – see Table 1), a 1 percent increase in private credit reduces inequality by 0.3 percent. Similarly, based upon the point estimates, an increase in the size of the modern sector will increase inequality whenever private credit accounts for over 14 percent

of GDP – far below the sample mean but fractionally higher than the sample minimum (see Table 1). In summary, financial sector development reduces inequality most in countries with relatively small 'modern' sectors, while increases in the size of the modern sector increase inequality most in countries with more developed financial markets. Based upon the point estimates of the coefficients in Table 2, however, it is important to note that increases in financial depth will decrease inequality for almost all of the countries in the sample, while increases in the size of the modern sector will increase inequality for most of the countries in the sample.

To summarize the empirical results, we find strong evidence to support the *linear hypothesis* that inequality is lower in countries with better-developed financial sectors. Further, we also find some evidence that supports the *augmented Kuznets hypothesis* – inequality is generally higher in countries with smaller agricultural sectors (i.e., larger industrial and service sectors) and that this effect appears stronger in countries with more developed financial sectors. In contrast, we do not find any support for the *inverted u-shaped hypothesis*. When squared terms for the indicators of financial sector development are included in the base specification, the coefficients on these terms are statistically insignificant.

VI. CONCLUSIONS

There has been little systematic empirical study on the relationship between finance and inequality. This paper attempts to examine this issue by testing empirically distinct predictions made by alternative theories. Specifically, Galor and Zeira (1993) and Banerjee and Newman (1993) predict a negative and linear relationship between finance and the Gini coefficient (*the linear hypothesis)*, while Greenwood and Jovanovic (1990) suggest an inverted U-shaped relationship (*the inverted-U shaped hypothesis)*. In addition, an important insight of Kuznets

(1955)—that the sectoral structure is important for the relation between economic development and income inequality—suggests that finance might reduce inequality to a lesser extent in countries with larger modern sectors (i.e., smaller agricultural sectors). Exploring the link between indicators of financial intermediary development and the Gini coefficient in a large cross-country sample for the period 1960-95, we experiment with both simple specifications and more sophisticated specifications that control for simultaneity. Overall, our results provide reasonably strong support for the *linear* and somewhat more modest support for the a*ugmented Kuznets hypotheses*. We find a significant negative coefficient on the measures of financial intermediary development, while we find a positive interaction of finance with the size of the modern sector. The results are least consistent with the *inverted-U shape hypothesis*—the coefficient on the squared term for the financial intermediary indicators is never statistically significant and, in fact, often has the wrong sign.

Overall, our results suggest that the growth-spurring effects of financial intermediary development are likely to be associated with positive effects on aggregate income distribution as well.[12] The dampening effect of financial intermediaries on income inequality, however, appears to depend upon the economic structure of the economy.

We recognize some limitation of our results, which stem mostly from the limitations of our measure of income inequality. Changes in the Gini coefficient can come about in different ways, by absolute and relative changes in one or several of the different income quintiles. We do not explore the impact that a higher level of financial intermediary development has on the income level of a specific quintile, for instance the poor. Moreover, even results obtained by

using quintile data have to be regarded with caution, since they do not control for migration between the quintiles over the sample period. To analyze directly the effect of financial development on specific groups of the population, one would have to use disaggregated data, preferably at the household level. This poses new challenges for future research.

[12] See Levine (1997a) for a recent literature survey on this topic. See also, Beck *et al*. (2001) for a discussion of more recent results.

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VIII. FIGURES AND TABLES

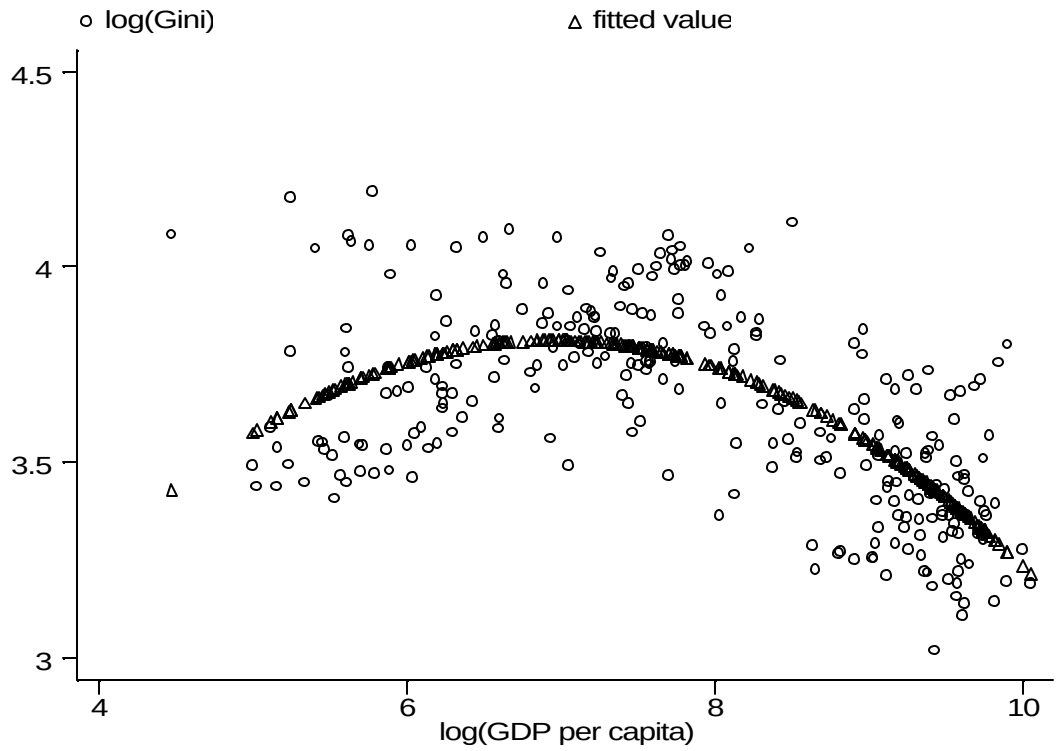

Figure 1: Log (Gini) and Log(GDP per capita) in a panel of 91 countries

Note: The fitted line is from a regression of log(Gini) on the log of real per capita GDP and its square.
All data are averaged over seven 5-year periods between 1960 and 1995.

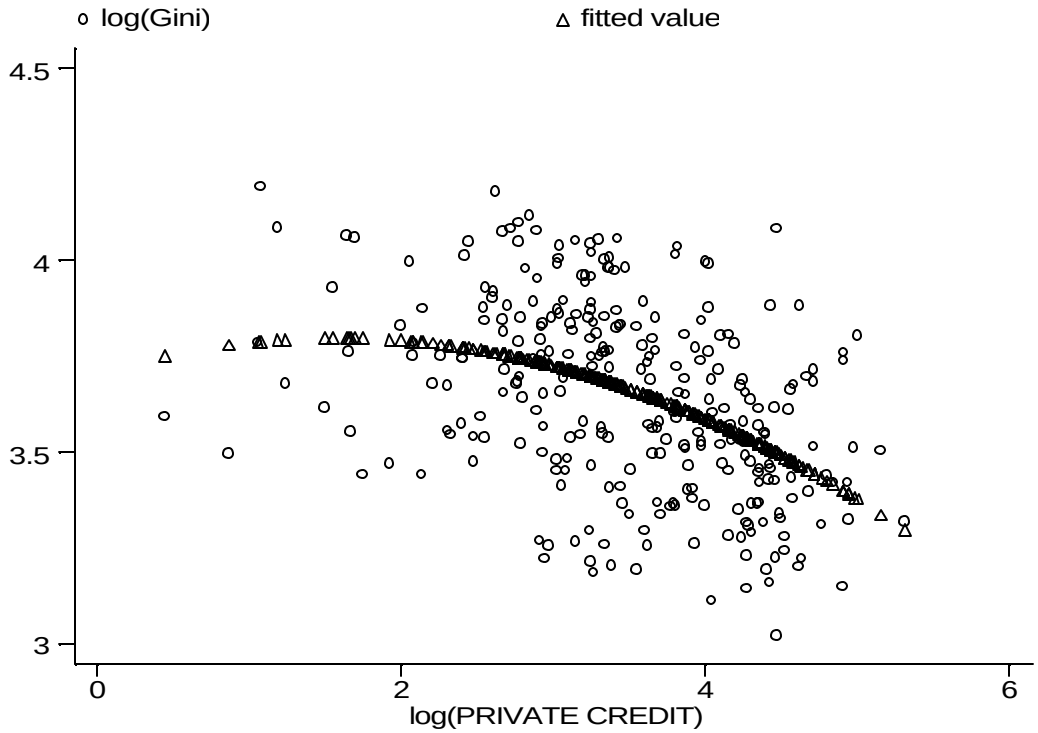

Figure 2: Log (Gini) against Log (Private Credit) in a panel of 91 countries

Note: The fitted line is from a regression of log(Gini) on the log of Private Credit and its square.
All data are averaged over seven 5-year periods between 1960 and 1995.

Table 1: Descriptive Statistics

	Gini Coef.	Private Credit	Bank Assets	Initial GDP per Capita	Risk of Exprop.	Ethno-linguistic Fract.	Gov't Cons.	Inflation Rate	Mod Sect. Val. Add.
Number of Observations	170	170	170	170	170	170	170	170	170
Mean	37.147	51.367	46.184	6327.2	7.6646	0.2552	14.67871	0.1255	87.443
Minimum	20.459	5.246	5.338	215.7	3.3000	0.0000	5.572046	0.0072	51.454
Maximum	60.001	202.759	141.725	20134.8	10.0000	0.8567	27.85384	1.1704	99.813
	Gini Coef.	**Private Credit**	**Bank Assets**	**Initial GDP per Capita**	**Risk of Exprop.**	**Ethno-linguistic Fract.**	**Gov't Cons.**	**Inflation Rate**	**Mod Sect. Val. Add.**
Gini Coefficient	1.00								
Private Credit	-0.33	1.00							
	(0.00)								
Bank Assets	-0.45	0.85	1.00						
	(0.00)	(0.00)							
Initial GDP per Capita	-0.58	0.70	0.62	1.00					
	(0.00)	(0.00)	(0.00)						
Risk of Expropriation	-0.52	0.64	0.65	0.80	1.00				
	(0.00)	(0.00)	(0.00)	(0.00)					
Ethno-linguistic Fractionalization	0.20	-0.36	-0.34	-0.46	-0.50	1.00			
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)				
Government Consumption	-0.46	0.28	0.29	0.62	0.49	-0.28	1.00		
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)			
Inflation Rate	0.44	-0.35	-0.37	-0.30	-0.31	-0.02	-0.25	1.00	
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.81)	(0.00)		
Modern Sector Value Added/GDP	-0.25	0.58	0.57	0.71	0.73	-0.66	0.45	-0.06	1.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.45)	

Note. **Gini** = measurement-adjusted Gini coefficient from Deininger and Squire (1996) and Lundberg and Squire (2000). **GDP per capita** = real per capita GDP. Source: Loayza *et al*. (1999). **Private Credit** = claims on the private sector by financial institutions divided by GDP. Source: Beck *et al*. (2000a). **Bank Assets** = claims on domestic non-financial sector by deposit money banks divided by GDP. Source: Beck *et al*. (2000a). **Risk of Expropriation** = Index indicating risk of expropriation through confiscation or forced nationalization. Higher values indicate that risk is lower. Source: International Country Risk Guide collected by the PRS Group. **Ethno-linguistic Fractionalization** = Average value of five indices of ethno-linguistic fractionalization, with values ranging from 0 to 1, with higher values indicating greater fractionalization. Source: Levine, Loayza and Beck (2000). **Government Consumption** = Government Consumption as share of GDP. Source: World Bank (2002). **Inflation Rate** = log difference of Consumer Price Index. Source: International Monetary Fund (2002). **Modern Sector Value Added/GDP** = value added of service and industrial sectors as share of GDP. Source: World Bank (2002).

drop correlation? note the negative correlation between modern sector & gini.

(alternatively, holding income level constant, the conditional correlation between Modern & Gini is positive.)

Table 2: Financial Intermediary Development and Income Inequality in a Panel: Private Credit

	Ordinary Least Squares			**Generalized Method of Moments**		
Dependent Variable	**Gini Coefficient (Natural Log)**					
Number of Observations	170	170	170	170	170	170
Number of Countries	44	44	44	44	44	44
Financial Sector Development						
Private Credit	0.0556**	-0.1723	-0.3536	-0.2362***	-0.0224	-1.4352**
(Natural Log, as share of GDP)	(2.04)	(-1.13)	(-1.50)	(-3.19)	(-0.01)	(-2.23)
Squared Private Credit		0.0317			-0.0265	
(Square of Natural Log, share of GDP)		(1.46)			(-0.09)	
Modern Sector*Private Credit			0.0046*			0.0144**
(Interaction Term)			(1.75)			(2.03)
Initial GDP						
Initial GDP per Capita	0.8242***	0.9656***	1.0736***	0.8076***	0.6807	1.3866***
(Natural Log)	(4.18)	(5.01)	(4.69)	(3.38)	(0.54)	(2.90)
Initial GDP per Capita Squared	-0.0578***	-0.0666***	-0.0740***	-0.0520***	-0.0444	-0.0913***
(Square of Natural Log)	(-4.70)	(-5.49)	(-5.09)	(-3.47)	(-0.59)	(-3.02)
Other Controls						
Risk of Expropriation	-0.0285**	-0.0281**	-0.0308**	-0.0116	-0.0138	-0.0275**
(Index – higher values mean lower risk)	(-2.26)	(-2.24)	(-2.52)	(-0.76)	(-0.55)	(-2.15)
Ethno-linguistic Fractionalization	0.0919	0.0992	0.1078	0.1623	0.1558	0.2149**
(Higher values mean greater fractionalization)	(1.24)	(1.38)	(1.54)	(1.63)	(1.05)	(2.54)
Government Consumption	-0.1007**	-0.0815	-0.0696	-0.1596**	-0.1745	-0.0496
(Natural Log, Share of GDP)	(-2.15)	(-1.62)	(-1.41)	(-2.32)	(-1.19)	(-0.68)
Inflation	0.2822***	0.2418**	0.2590***	-0.1275	-0.0603	-0.0114
(Natural Log)	(3.29)	(2.59)	(2.90)	(-0.74)	(-0.08)	(-0.08)
Modern Sector (Services and Industry)	0.0037	0.0027	-0.0108	0.0082**	0.0087	-0.0379
(Share of GDP)	(1.26)	(0.93)	(-1.17)	(2.02)	(1.27)	(-1.50)
Constant	0.6993	0.5804	0.9899	1.1797	1.2926	2.6746***
	(1.00)	(0.88)	(1.39)	(1.30)	(1.19)	(3.36)
R-Squared	0.57	0.57	0.58			
Hansen's J-Test (Significance Level)				0.50	0.32	0.19

***, **, * denote statistical significance at the 1, 5, and 10 percent levels.
The instruments for GMM specifications are dummies indicating legal origin. The null hypothesis of the Hansen test is that the instruments are not correlated with the error terms. White (heteroskedastic) t-statistics are reported in parentheses.

Table 3: Financial Intermediary Development and Income Inequality in a Panel: Bank Assets.

	Ordinary Least Squares			**Generalized Method of Moments**		
Dependent Variable	**Gini Coefficient (Natural Log)**					
Number of Observations	170	170	170	170	170	170
Number of Countries	44	44	44	44	44	44
Financial Sector Development						
Bank Assets	-0.0439*	-0.1402	-0.2557	-0.2418***	0.6200	-1.0973*
(Natural Log, as share of GDP)	(-1.77)	(-0.80)	(-1.19)	(-3.55)	(0.35)	(-1.66)
Squared Bank Assets		0.0140			-0.1162	
(Square of Natural Log, share of GDP)		(0.54)			(-0.49)	
Modern Sector* Bank Assets			0.0024			0.0092
(Interaction Term)			(0.99)			(1.26)
Initial GDP						
Initial GDP per Capita	0.8074***	0.8338***	0.8870***	0.7179***	0.5557	0.7498**
(Natural Log)	(4.07)	(4.08)	(4.13)	(3.11)	(1.29)	(2.23)
Initial GDP per Capita Squared	-0.0557***	-0.0574***	-0.0612***	-0.0500***	-0.0395	-0.0528**
(Square of Natural Log)	(-4.49)	(-4.47)	(-4.47)	(-3.51)	(-1.44)	(-2.47)
Other Controls						
Risk of Expropriation	-0.0199	-0.0204	-0.0223*	0.0008	-0.0013	-0.0084
(Index – higher values mean lower risk)	(-1.64)	(-1.64)	(-1.85)	(0.05)	(-0.08)	(-0.52)
Ethno-linguistic Fractionalization	0.1088	0.1119	0.1133	0.1411	0.1087	0.1778**
(Higher values mean greater fractionalization)	(1.41)	(1.43)	(1.50)	(1.60)	(0.94)	(2.04)
Government Consumption	-0.1020**	-0.0886	-0.0839	-0.0662	-0.1891	-0.0334
(Natural Log, Share of GDP)	(-2.08)	(-1.53)	(-1.59)	(-1.14)	(-0.71)	(-0.40)
Inflation	0.1571*	0.1518	0.1451	-0.0718	0.0500	-0.1367
(Natural Log)	(1.74)	(1.62)	(1.54)	(-0.47)	(0.20)	(-0.77)
Modern Sector (Services and Industry)	0.0053*	0.0050	-0.0020	0.0094**	0.0105**	-0.0165
(Share of GDP)	(1.73)	(1.61)	(-0.24)	(2.37)	(2.24)	(-0.66)
Constant	0.8694	0.9229	1.2016	1.3227	0.6339	3.6491***
	(1.21)	(1.30)	(1.54)	(1.54)	(0.41)	(2.82)
R-Squared	0.56	0.56	0.56			
Hansen's J-Test (Significance Level)				0.81	0.72	0.71

***, **, * denote statistical significance at the 1, 5, and 10 percent levels.
The instruments for GMM specifications are dummies indicating legal origin. The null hypothesis of the Hansen test is that the instruments are not correlated with the error terms. White (heteroskedastic) t-statistics are reported in parentheses.