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Abstract: While theory predicts different effects of household credit and enterprise credit on the economy, the empirical literature has mainly used *aggregate* measures of overall bank lending to the private sector. We construct a new dataset from 45 developed and developing countries, decomposing bank lending into lending to enterprises and lending to households and assess the different effects of these two components on real sector outcomes. We find that: 1) enterprise credit raises economic growth whereas household credit has no effect; 2) enterprise credit reduces income inequality whereas household credit has no effect; and 3) household credit is negatively associated with excess consumption sensitivity, while there is no relationship between enterprise credit and excess consumption sensitivity.

Who Gets the Credit? And Does It Matter?
Household vs. Firm Lending across Countries

1. Introduction

The theoretical literature linking the financial sector to the real economy makes a clear distinction between the roles of enterprise and household credit. Most theoretical models with endogenous financial intermediation focus on an enterprise in need of external finance for investment or production purposes (see Levine, 2005, for an overview). These models were motivated by the observation of financing constraints experienced by enterprises in many developing countries (McKinnon, 1973). In contrast, most of the empirical cross-country literature has used aggregate credit measures that combine enterprise and household credit (e.g. Beck, Levine and Loayza, 2000; Demirguc-Kunt and Maksimovic, 1998; Rajan and Zingales, 1998).[1] However, the focus on enterprise credit in both the theoretical and the empirical finance literature does not sit well with reality. Lending to the household sector has increased over time and, in fact, in many countries banks lend more to households than to firms. This observation puts into perspective the large theoretical and empirical literature that has studied the effects of private credit from the standpoint of firm credit only.

This paper assesses whether bank lending to enterprises and bank lending to households have independent impacts on GDP per capita growth, changes in income inequality, and the consumption sensitivity to output variation using a newly constructed data set from 45 developed and developing countries. In addition to building a broad disaggregated data set, our contribution is in matching theory more closely to empirics by considering the effects of household and enterprise lending separately. First, we assess whether measures of bank lending to enterprises

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[1] One exception is Büyükkarabacak and Krause (2009) who study the relationship between credit composition and trade balance.

and to households enter independently in standard OLS and IV cross-country growth regressions. Second, we explore whether enterprise credit and household credit are independently associated with reductions in income inequality. Third, we study whether enterprise and household credit are associated with consumption smoothing over the business cycle.

Analyzing the impact of cross-country variation in household and enterprise credit is important for several reasons. First, understanding the consequences of credit composition can have important repercussions for theory. If household credit has an independent impact on growth, this has implications for how theory should model the link between financial sector development and economic growth. Second, decomposing overall bank lending into its components might help us understand why the effect of financial development on growth varies across countries at different levels of economic development and provide insights into the channels through which financial systems foster economic development. Specifically, Aghion, Howitt, and Mayer-Foulkes (2005) and Rioja and Valev (2004 a,b) show that the effects of financial development on growth in high-income countries are relatively smaller. Third, understanding whether enterprise credit, household credit or both explain the negative relationship between financial sector development and income inequality can help us understand the channels through which this relationship works. Fourth, while theory has shown that better access to credit by households can help them cushion income shocks, thus smoothing consumption over the business cycle, empiricists have not assessed this hypothesis using data on household credit at the cross-country level. Finally, finding a differential impact of enterprise and household credit on growth, changes in income inequality and consumption smoothing can have important implications for policy makers who are interested in maximizing the real sector effect of financial sector policies.

While theory has suggested ample mechanisms through which enterprise credit helps economic growth, it provides ambiguous predictions about the effect of household credit on economic growth. Jappelli and Pagano (1994) argue that alleviating credit constraints on households reduces the savings rate, with negative repercussions for economic growth. Specifically, they show for a sample of 25 middle- and high-income countries that lower liquidity constraints on households, proxied by the loan-to-value ratio for mortgages, are associated with a lower savings rate and lower GDP per capita growth. On the other hand, Galor and Zeira (1993) and De Gregorio (1996) argue that household credit can foster economic development if it increases human capital accumulation. Empirical results by De Gregorio (1996) show for a sample of 20 OECD countries that higher loan-to-value ratios are associated with higher secondary school enrolment, but not with economic growth. Both theory and previous empirical work thus provide ambiguous predictions, with the effect of household credit on economic growth mainly depending on the use of the credit. Unlike our paper, most previous empirical work has been limited to OECD countries.

Recent cross-country comparisons have shown that countries with higher levels of financial intermediary development experience faster reductions in income inequality (Beck, Demirgüç-Kunt and Levine, 2007), thus confirming theories that predict that financial development helps the poor both by accelerating aggregate growth, and reducing income inequality. Theory, however, points to different channels through which this relationship can work. On the one hand, there might be a direct impact by enabling the poor to invest in their human capital and in microenterprises by gaining access to credit, an effect, which is more likely to be captured by household credit (Galor and Zeira, 1993; Banerjee and Newman, 1993). On the other hand, financial deepening might result in a more efficient capital allocation across

incumbent and new enterprises, fostering structural change, higher growth and lower income inequality, an effect, which is more likely to be captured by enterprise credit (Gine and Townsend, 2004; Beck, Levine and Levkov, 2007). Disentangling the exact mechanisms requires more detailed data on the use of credit. Here we aim to provide tentative evidence by showing whether credit to enterprises or credit to households contributes more to reductions in income inequality.

A third aspect addressed by this study is whether higher levels of household credit leads to consumption smoothing by easing credit constraints households face. While the permanent income hypothesis states that consumption is determined by permanent income and not by transitory changes to income, empirical work shows that consumption varies with output in an economy. The extent to which changes to consumption are explained by changes to income is referred to as the "excess sensitivity" of consumption to income. Theory points to a positive impact of household credit on relaxing liquidity constraints on households, thus resulting in lower excess sensitivity of household consumption to business cycle variations (Jappelli and Pagano, 1989; Bacchetta and Gerlach, 1997; Ludvigson, 1999). None of these papers, however, have focused on household credit for a large set of countries as we do. Regarding the effect of enterprise credit on excess consumption sensitivity, a priori, there is no theoretical reason for a direct link.

Summarizing, the effect of household credit on economic growth is a-priori ambiguous, while theory suggests a dampening impact of household credit on the excess sensitivity of consumption to income fluctuations. Enterprise credit, on the other hand, can be expected to be positively related to economic growth, while there is no theoretical argument suggesting a relationship between consumption smoothing and enterprise credit. Also, theory makes

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ambiguous predictions about whether enterprise credit, household credit or both explain the negative relationship between financial sector development and changes in income inequality.

Analyzing credit composition across countries and over time shows that the share of household credit increases as countries develop economically and financially. Cross-country regressions with data averaged over 1994 to 2005 suggest, however, that only bank lending to enterprises, but not to households, is linked to GDP per capita growth. This finding is robust to the use of instrumental variables, sample composition and controlling for a large array of other country factors. We also find that the relationship between enterprise lending and growth is more precisely estimated than the relationship between overall bank lending and growth and significant for a broader range of countries. Cross-country regressions also show a negative and robust relationship between Enterprise Credit to GDP and changes in income distribution, while there is no robust link between Household Credit to GDP and changes in income inequality after we control for enterprise lending. This relationship is again robust. Finally, cross-country regressions show a negative relationship between household credit and consumption smoothing, but no significant association of enterprise lending with excess consumption sensitivity. Specifically the extent to which consumption reacts to output volatility is negatively associated with higher levels of Household Credit to GDP; a relationship, however, that is not robust when controlling for simultaneity bias and reverse causation.

This paper is a first attempt at understanding the composition of bank lending across countries and its impact and is therefore subject to several caveats. First, the definition of household vs. firm credit is not homogenous across countries and our variable is therefore subject to measurement error. Further, a strict separation into firm and household credit might not be possible in the case of proprietorships. Second, cross-country regressions are subject to

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the usual biases of endogeneity and simultaneity. While we control for these biases by employing instrumental variables, our estimations are subject to the usual caveats of cross-country regressions. Finally, due to data constraints, we focus on bank lending to households and ignore lending to households by non-financial institutions, an increasing phenomenon in many high- and middle-income countries.

The remainder of the paper is organized as follows. Section 2 discusses the construction of our main variable of interest. Section 3 discusses the methodology, while Section 4 presents the results. Section 5 concludes.

2. Decomposing Bank Lending

Standard financial sector indicators focus on the aggregate value of credit to the private sector by deposit money banks, but do not distinguish between lending to households and lending to firms. We compile data from national central bank reports, annual bulletins, and other statistical sources where disaggregated credit data are available. Our dataset includes 45 countries spanning different time periods depending on data availability but with a significant overlap during the period from 1994 to 2005. In order to avoid discrepancies between different countries we standardized our data collection methodology by focusing on the collection of data on credit to non-financial corporations and/or private enterprises/businesses by deposit money banks, where available. If private credit is reported for various economic sectors, we define business credit as the sum of loans to industry, construction, services, agriculture, and trade. We then use the credit series from the Financial Structure Database of Beck, Demirgüç-Kunt and Levine (2000) to obtain the distribution of credit into enterprise credit and household credit as

the difference between overall credit and enterprise credit. While we have annual data available, we will use mostly averages over the period 1994 to 2005.

Table 1 presents the large variation in overall banking sector development and the relative importance of enterprise and household credit across our 45 sample countries. Specifically, we present Bank Credit to GDP – total claims of deposit money banks on the private sector as ratio of GDP - and its two components – Enterprise Credit to GDP and Household Credit to GDP. We also present the relative share of enterprise and household credit in total bank credit. Whereas Bank Credit to GDP was 15% over the sample period in Russia, it was 164% in the Netherlands. Enterprise Credit to GDP varied from 9% in Argentina and Mexico to 114% in Malaysia, while Household Credit to GDP varied from 3% in Russia to 101% in the Netherlands. Whereas Canada, Denmark and the U.S. had a household credit share well over 70% of total bank credit during 1994-2005, the household credit share was 10% in Malaysia during the same period.

The correlations in Table 2 Panel A indicate that both Enterprise Credit to GDP and Household Credit to GDP are positively and significantly correlated with Bank Credit to GDP. As banking sectors develop, however, the share of household credit increases, as can be seen from the negative and significant correlation of Enterprise Credit Share with Bank Credit to GDP. Similarly, while economically more developed countries have higher ratios of both enterprise and household credit to GDP, the relative importance of household credit increases. This is not surprising, as economic development can influence the provision of household credit both through the supply and demand channels. On the one hand, rising incomes will allow a larger share of households to overcome the threshold of minimum loan size for consumer and mortgage loans (Beck, Demirgüç-Kunt and Martinez Peria, 2008). On the other hand, the cost of

financial service provision declines with economic development (Harrison, Sussman and Zeira, 1999). Both trends should increase the share of household credit in total bank lending.

3. Methodology

We run cross-country regressions to assess the independent effect of enterprise and household lending on (i) GDP per capita growth, (ii) changes in income inequality, and (iii) excess consumption sensitivity to output variations. In this section, we will discuss dependent variables and methodologies of each of these three tests. In all our empirical analysis, we are limited to cross-country rather than panel analysis, as data on credit composition are only available for few years for most countries.

3.1. Credit composition and economic growth

We run cross-country growth regressions to assess the impact of bank lending to enterprises and households on economic growth, averaged over the sample period 1994 to 2005. By averaging data over ten years, we are confident that we abstract from business cycle variations and focus on the effect of different credit components on medium- to long-term growth. Specifically, we utilize Barro-style growth regressions of the following form:

$$g(i) = [y(i,t) - y(i,t-1)]/11 = \alpha_1 + \beta_1 \text{Enterprise Credit to GDP}(i) +$$

$$+ \beta_2 \text{Household Credit to GDP}(i) + \gamma'C(i) + \delta y(i,t-1) + \varepsilon(i),$$

where $y(i)$ is log of real GDP per capita and C is a set of conditioning information. The coefficients of interest are β_1 and β_2. We run regressions where we force $\beta_1 = \beta_2$, thus replicating the standard finance and growth regression with the aggregate measure of Bank

Credit to GDP, regressions with $\beta_1 = 0$, regressions with $\beta_2 = 0$ and regressions where we allow β_1 and β_2 to enter independently.

To assess the strength of the independent link between bank lending to enterprises and households and economic growth, we control for other potential determinants of economic growth in our regressions. Following the finance and growth literature, our set of conditioning information includes (i) the log of initial real GDP per capita to control for convergence, (ii) secondary school enrolment to control for human capital accumulation, (iii) the share of exports and imports to GDP, (iv) the inflation rate and (v) the ratio of government expenditures to GDP.[2] In robustness tests, we include additional variables, which we will discuss below. All data are averaged over the sample period 1994 to 2005, with the exception of initial GDP per capita, measured in 1994. We include most regressors, including Enterprise Credit to GDP and Household Credit to GDP in logs, to take account of potential non-linearities in their relationship with GDP per capita growth. Our main findings, however, are confirmed when using the financial development indicators in levels rather than logs.

GDP per capita growth, calculated as the average annual real growth rate in GDP per capita, varied significantly across our sample over the period 1994 to 2005, ranging from -0.6% in Russia to 5.5% in Korea. While it is positively and significantly correlated with Bank Credit to GDP and Enterprise Credit to GDP, it is not significantly correlated with Household Credit to GDP (Table 2 Panel A). In sensitivity analyses, we also consider capital per capita growth and productivity per capita growth. We use capital data from the Penn World Tables in 1992 and – following King and Levine (1994) - use the perpetual inventory method with a depreciation rate of seven percent to compute capital stocks through 2005. Following Beck, Levine and Loayza

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[2] Similar sets of conditioning information were used by Beck, Levine and Loayza (2000) and Beck and Levine (2004).

(2000), we then compute productivity growth as GDP per capita growth minus 0.3*Capital per capita growth, where 0.3 is the capital share in the aggregate production function that we assume to be common across countries.

OLS regressions suffer from several biases, including omitted variable, measurement and endogeneity biases. We therefore use instrumental variable regressions to extract the exogenous components of bank lending to enterprises and households and relate them to GDP per capita growth. Following the seminal work by La Porta et al. (1997, 1998) who identified variation in countries' legal origin of countries as a historical exogenous factor explaining current variation in countries' level of financial development, an extensive literature has utilized this variable to extract the exogenous component of financial development. Specifically, Common Law countries are typically found to have deeper financial systems than French Civil Code systems, with German and Scandinavian Civil Law systems somewhere in between (Beck, Demirgüç-Kunt and Levine (2003). Transition economies are often as a separate group of countries given their relative recent history of market-based financial service provision. Stulz and Williamson (2003), on the other hand, suggest religious composition as an important driver of cross-country differences in financial development. Specifically, they show that countries with predominantly Protestant population have stronger creditor rights. We will test the validity and relevance of our instruments with two tests. First, the F-test of the excluded exogenous instruments in the first stage will indicate whether the instruments explain variation in Enterprise Credit to GDP and Household Credit to GDP and are thus relevant. Second, the Sargan test of overidentifying restrictions tests for correlations between the error terms of the second stage and the exogenous excluded variables. Not rejecting the null hypothesis suggests that the exogenous variables are only correlated with the dependent variables through the included explanatory variables.

3.2. Credit composition and changes in income distribution

We utilize the same regression set-up as in (1) to assess the effect of Enterprise Credit to GDP and Household Credit to GDP on changes in income inequality. Following Beck, Demirgüç-Kunt and Levine (2007), we use two measures of income inequality; the Gini coefficient and the income share of the poorest quintile. The Gini coefficient is derived from the Lorenz curve, where larger values imply greater income inequality. **Growth of Gini** equals the annual growth rate of each country's Gini coefficient, computed over the latest multi-year time period, for which data are available.[3] Specifically, we compute the log difference between the last and the first available observation and divide by the number of years between these two observations, with the time span being between at least five and at most seven years. **Growth of Lowest Income Share** equals the annual growth rate of the share of the lowest income quintile, computed over the same period as Growth of Gini. Specifically, Growth of Lowest Income Share is defined as the difference between the logarithm of the share of the lowest income quintile for the last observation and the logarithm of the share of the lowest income quintile for the first observation, divided by the number of years between the two observations. These data are available for 33 of our 45 sample countries. In our regression analysis, we will control for the same country factors as in the growth regressions, plus the annual growth rate in real GDP per capita, following Beck, Demirgüç-Kunt and Levine (2007). As in the growth regressions, we will also control for reverse causation and simultaneity bias by utilizing legal origin dummies and religious composition indicators as instrumental variables for enterprise and household lending.

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[3] We use income quintile and Gini data from Dollar and Kraay (2002) and UNU-WIDER (2006) to compute the level and growth rate of this variable. Dollar and Kraay obtain income share and Gini data from Deininger and Squire (1996), the UN-WIDER World Income Inequality Database, Chen and Ravallion (2000) and Lundberg and Squire (2000). We update their data with more recent data points from UNU-WIDER (2006). Unlike in the case of GDP numbers, income inequality data are not available for every year.

Not only the level, but also changes in income inequality vary significantly across countries. The Gini dropped, on average, by 7% per year in Japan over the period 1989 to 1995, while it increased by 8% in Jamaica over the period 1993 to 97. The share of the lowest income quintile grew by an annual 18% in Macedonia between 1996 and 2001, while it dropped by an annual 15% in Australia over the period 1993 to 98. While Bank Credit to GDP and Enterprise Credit to GDP are both significantly and negatively correlated with Growth in Gini, Household Credit to GDP is not. None of the three financial sector indicators is significantly correlated with Growth in Lowest Income Share at the 5% level.

3.3. Credit composition and excess consumption sensitivity

The permanent income hypothesis states that consumption is determined by permanent income and not by transitory changes to income. Contemporaneous changes to income and consumption should therefore not be correlated. However, empirical work shows that they are. The extent to which changes to consumption are explained by changes to income is referred to as the "excess sensitivity" of consumption to income. In estimating this "excess sensitivity" coefficient, which we denote as λ, we follow the basic approach of Campbell and Mankiw (1989, 1990) and Jappelli and Pagano (1989) and estimate the following equation, using quarterly data from 1980 to 2005:

$$\Delta c_t = \alpha + \lambda \Delta y_t + \varepsilon_t,$$

where Δc_t is the four-quarter change in real aggregate consumption and Δy_t is the four-quarter change in real GDP.[4] The coefficient λ measures how sensitive consumption is to changes in income. Since Δy_t is likely correlated with the disturbance ε_t, we follow Campbell and Mankiw

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[4] Ideally, we would like to distinguish between durable and non-durable consumption; however, such data are not available for a sufficiently large group of countries. We use a longer time span starting in 1980 to generate more precise estimates of λ. We obtain very similar results with estimates based on 1994-2005.

(1989) and instrument Δy_t with its own lags Δy_{t-2}, Δy_{t-3}, and Δy_{t-4}. We use an F-test to test the validity of the instruments and keep in the sample only countries for which the instruments are statistically significant predictors of the change in income. This reduces the sample by seven countries.[5] In addition, quarterly data on GDP and/or consumption were not available for another seven countries (Egypt, Jamaica, Kenya, Macedonia, Pakistan, Russia, and Uruguay), which leaves us with a sample of 31 countries for which we have estimates of λ. The excess consumption sensitivity ranges from 0.42 in Australia to 1.32 in Estonia.[6] While in Australia, only 42% of transitory income shocks translate into corresponding changes in consumption, consumption in Estonia is even more volatile than output. While the excess consumption sensitivity is negatively and significantly at the 1% level correlated with income per capita and Household Credit to GDP, it is not significantly correlated with either Bank Credit to GDP or Enterprise Credit to GDP.

We then use cross-country regressions to estimate the relationship between Bank Credit to GDP, Enterprise Credit to GDP, Household Credit to GDP and λ, the excess sensitivity of consumption. We include three additional variables that have been used in the literature to explain the excess sensitivity of consumption. First, following Jappelli and Pagano (1989) and Bacchetta and Gerlach (1997) we add the spread between the lending and the deposit interest rate, which reflects imperfections in capital markets that contribute to the liquidity constraints facing households. A greater spread is expected to be associated with a greater value of λ.

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[5] We also tried using different lag combinations as instruments in some cases where the benchmark lag structure did not pass the F-test. This approach was successful for a couple of countries, but not for 7 countries whose λ's were not used in our subsequent analysis.

[6] While a $\lambda>1$ is prima facie surprising, one possible explanation is that some countries are more likely to face internal and international credit constraints which tend to amplify shocks. Kaminsky, Reinhart, and Vegh (2004), for example, argue that external borrowing increases in good times and falls in bad times, especially in emerging economies. Also, internal credit constraints, which are tied to housing values or income, are eased in good times due to higher housing prices and income levels and get more restricted during downturns (Bernanke et al., 1999; Kiyotaki and Moore, 1997). This pro-cyclical nature of internal and international credit provides important insights in understanding the high consumption to income volatility ratios.

Second, we include savings as percent of the Gross National Income (GNI), following Evans and Karras (1996). A sustained high savings rate leads to accumulation of assets that, in turn, increase access to financing. Third, we control for the volume of government transfers and other social safety net spending as percent of GDP. Evans and Karras (1996) show, for a sample of 54 countries, evidence for substitutability between private consumption and government consumption. Therefore, a more generous safety net that serves as an automatic stabilizer to consumption might reduce the sensitivity of private consumption to changes in income. We entered the three variables into the regressions using their 1994-2005 averages, which matches the period of the credit variables.[7] Although the literature has not raised concerns about endogeneity, for consistency with the previous sections, we will also utilize legal origin dummies and religious composition indicators as instrumental variables.

4. Results

4.1. Credit composition and economic growth

The Table 3 results show a positive and significant relationship between enterprise credit and GDP per capita growth, but an insignificant relationship between household credit and GDP per capita growth. Columns 1 to 4 present simple OLS regression utilizing indicators of overall banking sector credit to GDP, enterprise credit to GDP and household credit to GDP controlling for an array of other country characteristics.

The column 1 regression confirms the previous finding of a positive and significant relationship between banking sector development and GDP per capita growth. Bank Credit to GDP enters positively and significantly at the 5% level. The column 2 regression shows a

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[7] We obtained similar results with averages over longer periods of time, e.g. 1980-2005.

positive and significant relationship between Enterprise Credit to GDP and GDP per capita growth, while the column 3 regression shows an insignificant relationship between Household Credit to GDP and GDP per capita growth. When we include both Enterprise Credit to GDP and Household Credit to GDP, our findings are confirmed (column 4).[8] Among the variables in the set of conditioning information, only government consumption enters consistently with a negative and significant coefficient. In unreported regressions, we confirm our findings in a smaller sample that excludes 11 transition economies. Throughout all of the analyses in this paper, we identify and assess the potential impact of outliers by following the methodology of Besley, Kuh, and Welsch (1980).[9] While for regression (4) we could not identify any influential outlier for enterprise credit, we dropped Korea, Latvia, Russia, Switzerland, and South Africa as potentially influencing the result on household credit. Even when excluding these countries, Household Credit to GDP does not enter significantly at the 5% level, while Enterprise Credit to GDP continues to enter positively and significantly.

The effect of Enterprise Credit to GDP is not only statistically, but also economically significant. Take Bulgaria and Iceland, the countries at the 25th and 75th percentiles of Enterprise Credit to GDP. The regression results in column 2 suggest that if Bulgaria had the level of Enterprise Credit to GDP as Iceland, it would have grown 0.7 percentage points faster per year over the period 1994 to 2005. This economic effect is somewhat smaller than the economic effect of Bank Credit. Specifically, using the column 1 estimate and comparing Hungary and

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[8] Further, a difference test between the coefficient on Enterprise Credit to GDP and Household Credit to GDP is significant.
[9] Specifically, we (i) compute the change in the coefficient on Enterprise Credit to GDP when the ith observation is omitted from the regression, (ii) scale the change by the estimated standard error of the coefficient, (iii) take the absolute value, and (iv) call the result $\Delta\beta_i$. Then, we use the Besley, Kuh, and Welsch recommendation of a critical value of two, and identify those observations where abs $(\Delta\beta_i) > 2/\text{sqrt}(n)$, where abs(x) yields the absolute value of x, sqrt(x) yields the square root of x, and n represents the number of observations in the regression.

Canada, the countries at the 25th and 75th percentiles of Bank Credit to GDP, yields an economic effect of Bank Credit to GDP of 1.1 percentage points higher growth per year.

The relationship between Enterprise Credit to GDP and GDP per capita growth is robust to controlling for endogeneity and simultaneity and measurement biases (column 5). When instrumenting for both Enterprise and Household Credit to GDP with indicators of country's legal origin and religious composition, Enterprise Credit to GDP continues to enter positively and significantly, although only at the 10% significance level. The first-stage F-tests reject the hypotheses that the legal origin and religious composition indicators cannot explain variation in Enterprise Credit to GDP and Household Credit to GDP. Interestingly, the religious composition variables enter jointly significantly at the 5% level in the first-stage regression of Enterprise Credit to GDP, while the legal origin dummies enter jointly significantly only at the 7% level. In contrast, the legal origin dummies enter jointly significantly at the 1% level in the first-stage regressions of Household Credit to GDP, while the religious composition variables do not enter significantly. Legal origin seems to be doing a better job in explaining cross-country variation in household lending across countries, while religious composition is better in explaining enterprise lending across countries. Our set of instrumental variables therefore do not only have the characteristics that they can explain well variation in the endogenous variables, but that we can separate the effect of historical determinants on enterprise and on household lending. The Sargan test of overidentifying restrictions is not rejected, suggesting that legal origin and religious composition affect GDP per capita growth only through one of the explanatory variables.[10] While subject to the usual caveats of cross-country instrumental variable regression

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[10] We considered additional specification tests, available on request. Specifically, the Anderson canonical correlations likelihood ratio test of instrument relevance, Shea's partial R squares measure of instrument relevance and the Cragg-Donald test of weak instruments provide evidence that both the legal origin and the religious composition variables are valid and relevant instruments. Similar, we do not find that either the legal origin or the

– bias due to lagged dependent variable, potentially weak instruments and lack of instruments for other explanatory variables – these findings suggest that the relationship between Enterprise Credit to GDP and GDP per capita growth is not driven by endogeneity, simultaneity or measurement biases.

Taken together, the results in Table 3 suggest that only the component of private sector lending going to enterprises is robustly linked with economic growth, while bank lending to households is not.   Our results confirm theoretical predictions that financial institutions and markets foster economic growth through alleviating firms' financing constraints.   They are consistent with the empirical finance and growth literature analyzing the relationship between financial sector development and firms' financing constraints and growth.   They are also consistent with an ambiguous relationship between household credit and economic growth, with positive effects through human capital allocation and negative effects through dampening the savings rate canceling each other out.

The Table 4 results confirm the robustness of our findings to (i) adding control variables and (ii) looking at the sources of growth. The result in column 1 suggests that the positive effect of Enterprise Credit to GDP is independent of the positive effect that stock market development has on economic growth. Specifically, here we control for Value Traded to GDP, an indicator of stock market liquidity that previous studies have found to be positively and significantly associated with GDP per capita growth (Levine and Zervos, 1998; Beck and Levine, 2004). While we confirm the positive impact of liquid stock market, Enterprise Credit to GDP continues to enter positively and significantly. The columns 2 -4 regressions shed light on the channels

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religious composition set of instrumental variables are redundant in the sense that including either set of instrumental variables improves the asymptotic efficiency of the estimation. See Baum, Shaffer and Stillmann (2003) for a discussion of these different test statistics.

through which Enterprise Credit fosters economic growth. Specifically, column 2 shows that Enterprise Credit to GDP continues to enter significantly – though only at the 10% level -and with similar size when controlling for Investment to GDP, while the investment ratio itself does not enter significantly. This suggests that it is not necessarily through capital accumulation but through productivity growth and resource allocation that higher levels of bank lending to enterprises enhance economic growth. This finding is confirmed in columns 3 and 4 where we use two dependent variables that capture the sources of economic growth – capital accumulation and productivity growth. The column 3 regression shows no significant relationship between capital accumulation and Enterprise Credit to GDP, while column 4 shows a significant and positive relationship between productivity growth per capita and Enterprise Credit to GDP. This confirms findings by Beck, Levine and Loayza (2000) of a robust and positive relationship between financial intermediary development and productivity growth and an at most tenuous relationship between financial intermediary development and capital accumulation. Household Credit to GDP does not enter significantly in any of the Table 4 regressions.

Several studies have found significant country heterogeneity in the finance-growth relationship; Aghion, Howitt and Mayer-Foulkes (2005) found that the finance-growth link is much weaker or even non-existent for high-income countries, while Rioja and Valev (2004a, b) found that the relationship is strongest for middle-income countries. Can the cross-country variation in credit composition explain this country heterogeneity?

The regressions in Table 5 show that Bank Credit to GDP and Enterprise Credit to GDP are significant at the 25th and 50th of initial income per capita, while Household Credit to GDP does not enter significantly at any level of economic development. Here, we add interaction terms of Bank Credit to GDP (column 1), Enterprise Credit to GDP (column 2) and Household

Credit to GDP (column 3) with the log of initial GDP per capita to assess whether there is a differential effect of banking sector development across different levels of economic development. Further, we report the overall effect of banking sector development at different levels of initial GDP per capita. The column 1 regression of Table 5 shows that the relationship between banking sector development and GDP per capita growth decreases in the level of economic development and turns insignificant for high income countries.[11] Specifically, while Bank Credit to GDP is significant both at the 25th and 50th percentile of GDP per capita, it is insignificant at the 75th percentile. Overall, the relationship between Bank Credit to GDP and GDP per capita growth is significant at the 5% for 24 of the 45 countries in our sample. Similarly, the column 2 regression shows that Enterprise Credit/GDP has a significant relationship with GDP per capita growth at the 25th and 50th percentile of initial income per capita, while it insignificant at the 75th percentile of GDP per capita. A more detailed analysis, however, shows that the relationship between Enterprise Credit to GDP and GDP per capita growth is significant at the 5% level for 29 of our 45 sample countries. The relationship between Household Credit to GDP and GDP per capita growth is insignificant, irrespective of the level of initial GDP per capita.

Figures 1 and 2 illustrate that the estimation of the relationship between enterprise credit to GDP and growth is more precise than the estimation of the relationship between overall credit to GDP and growth. Specifically, we show the marginal effect of Bank Credit to GDP (Figure 1) and Enterprise Credit to GDP (Figure 2) on GDP per capita growth at different levels of initial GDP per capita, as well as the 5% level significance band. While both relationships clearly slope downwards, the significance bands for Bank Credit to GDP are wider, resulting in an

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[11] The fact that both Bank Credit to GDP, initial income and their interaction are insignificant, can be explained by the very high correlation between the three variables.

insignificant relationship with GDP per capita both at the low end of our sample in terms of initial economic development, as well as in the upper third. The relationship between Enterprise Credit to GDP and GDP per capita growth, on the other hand, is more precisely estimated. Specifically, the relationship between Bank Credit to GDP and growth is significant for GDP per capita between 1,000 and 8,000 dollars, while the relationship between Enterprise Credit to GDP and growth is significant for GDP per capita of up to 13,000 dollars, including New Zealand. While the relationship between Bank Credit to GDP and economic growth is thus significant mostly for middle-income countries, the relationship between Enterprise Credit to GDP and economic growth is significant for low-, middle- and even some high-income countries.

Summarizing, the positive impact of financial development on growth has been driven by bank lending to enterprises rather than to households.   The increasing importance of household credit in total credit in high-income countries documented in section 2 also partly explains why the impact of overall bank lending on GDP per capita growth in these countries is insignificant. The relationship between Enterprise Credit to GDP and GDP per capita growth turns insignificant at higher levels of GDP per capita than the relationship between Bank Credit to GDP and GDP per capita growth.

4.2. Credit composition and income inequality

The results in Table 6 show a negative relationship between Enterprise Credit to GDP and changes in the Gini coefficient and the income share of the lowest quintile, but no significant relationship of Household Credit to GDP with either measure of changes in income distribution. Here, we regress Growth of Gini and Growth of Lowest Income Share on the initial dependent variable, government consumption, trade share, inflation, GDP per capita growth as well as our

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financial sector indicators. While both Bank Credit to GDP (Column 1) and Enterprise Credit to GDP (Column 2) enter negatively and significantly, Household Credit to GDP does not (Column 2). When instrumenting for both Enterprise and Household Credit to GDP in column 3, we confirm our finding of a negative and significant relationship between enterprise lending and reductions in the Gini coefficient, while household lending continues to enter insignificantly. The Sargan test and the first stage F-tests both confirm the validity of our model. Columns 4 – 6 show similar findings for our second measure of changes in income inequality, the average annual growth rate in the lowest income share. While Bank Credit to GDP does not enter significantly (column 4), Enterprise Credit to GDP enters positively and significantly in both OLS and IV regression (columns 5 and 6). Household Credit to GDP does not enter significantly in the OLS regression and even negatively and significantly in the IV regression. As before, Sargan and first stage F-tests confirm the validity of our instruments and specification for the IV regression.

Together, these results suggest that the impact of financial sector development on reductions in income inequality goes through enterprise rather than household lending, a finding that is consistent with Gine and Townsend (2004) and Beck, Levine and Levkov (2007) and inconsistent with theories focusing on credit for the poor helping them to pull themselves out of poverty by investing in human capital or microenterprises (Galor and Zeira, 1993; Banerjee and Newman, 1993). While our small sample does not allow us to use changes in poverty levels, such as the headcount as dependent variable, the findings in Table 6 underline that it is Enterprise Credit that drives the pro-poor nature of financial sector development, as changes in poverty can be decomposed in economic growth and changes in income inequality (Kakwani, 1993; Datt and Ravallion, 1992).

4.3. Credit composition and consumption smoothing

The results in Table 7 show that Household credit as percent of GDP is negative and significantly associated with excess consumption sensitivity. While the column 1 regression shows an insignificant relationship between overall bank lending to the private sector and consumption smoothing, the column 2 and 3 regressions document a negative relationship between Household Credit to GDP and excess consumption sensitivity, significant at least at the 10% level. In addition, the size of its coefficient estimate is fairly uniform across the estimations, thus independent of other country traits we control for. Conversely, Enterprise Credit to GDP does not enter significantly in any of the regressions. In addition, none of the other control variables – the interest rate spread, savings to GNI and government transfers to GDP enter significantly at the 5% in any of the regressions.

The negative association of household lending with excess consumption sensitivity cannot be confirmed in the last column of Table 7 where we use instrumental variable techniques to extract the exogenous components of household and enterprise credit. The column 4 results show an insignificant coefficient Household Credit to GDP, a result we confirm when leaving out Enterprise Credit to GDP or the other control variables. This might not be surprising given the small number of observations and the insignificant value of the first stage F-test on household credit.[12] Yet, we cannot reject the possibility that the negative relationship between household lending and excess consumption sensitivity is driven by endogeneity or simultaneity biases.

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[12] When considering separate F-tests for legal origin and religious composition, we find that the legal origin variables predict household credit, but religious composition does not. Using only legal origin to instrument for household credit produces similar results to column 4.

5. Concluding Remarks

This paper is a first attempt to decompose bank credit to the private sector into household and firm credit for a large sample of countries and test various theoretical hypotheses about their effects on the real economy. The data show that household credit is an important part of the lending activities of banks. In fact, in many countries, banks lend more to households than to firms. This observation puts into perspective the large theoretical and empirical literature that has studied the determinants and effects of private credit from the standpoint of firm credit only.

We find that it is bank lending to enterprises, not to households that drives the positive impact of financial development on economic growth. Our findings justify the focus of the existing finance and growth literature on enterprise as opposed to household credit. They add further evidence that financial systems foster economic growth by alleviating firms' financing constraints. Further, the insignificant relationship between household lending and growth together with the increasing share of bank lending to households in economically more developed countries go some way towards explaining the non-linear finance-growth relationship. Specifically, while total bank lending to GDP is not robustly linked to GDP per capita growth in high-income countries, the relationship between enterprise lending to GDP and economic growth is much more precisely estimated across our sample, with even many high-income countries showing a significant relationship.

We also find that it is enterprise rather than household lending that drives the dampening effect that financial sector development has on income inequality. This provides tentative evidence that it is rather through improved capital allocation and economic transformation that finance reduces inequality than through expanding access to credit, and is consistent with previous work looking at specific countries, such as Thailand and the U.S. and the ambiguous

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evidence that the empirical literature has found on the effect of microcredit (see World Bank, 2007). Finally, with a caveat about possible endogeneity, we find that household lending is associated with lower excess sensitivity of consumption to business cycle fluctuations whereas enterprise credit has no statistically significant effects.

This exploration of enterprise versus household credit across countries is an initial assessment of the factors that drive credit composition and its effects. As longer time-series data become available, allowing the construction of longer panel data sets, more rigorous hypothesis will be possible.

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Appendix Table A1. Enterprise credit definitions

| Country	Variable definitions
Argentina	Financing by activities: credit to production, industry, construction, services, electricity, and commerce.
Australia	Bank lending classified by sector: commercial lending
Austria	Financial liabilities of non-financial corporations: short-term and long-term loans.
Belgium	Loans originally granted by credit institutions to Belgian non-financial corporation
Bulgaria	Commercial banks credit: credit to private enterprises, total
Canada	Business loans from chartered banks
Costa Rica	Credit from deposit money banks: credit to production, industry, construction, services, electricity, and commerce.
Czech Republic	Banking statistics: loans: sectoral breakdown, commercial banks, non-financial corporations
Denmark	Bank lending to non-financial corporations.
Egypt	Banks lending by private sector: private businesses: local and foreign currency
Estonia	Loans granted by groups of customers: commercial undertakings
Finland	Finnish MFIs' euro-denominated loans, non-financial corporations, stock
France	Lending by credit institutions to non-financial corporations: total
Germany	Lending to domestic enterprises and self-employed persons/total/commercial banks
Greece	Domestic MFI credit to domestic enterprises
Hungary	Credits to enterprises and small entrepreneurs
Iceland	Deposit money banks credit to industries
India	Distribution of outstanding credit of scheduled commercial banks according to occupation: everything but personal and miscellaneous.
Indonesia	Outstanding credit by commercial banks by group of debtor: Rupiah and foreign currency by private enterprises
Ireland	Sectoral distribution of advances: All financial institutions
Jamaica	Commercial banks analysis of loans and advances: everything but government and personal credit
Japan	Loans and discounts outstanding by sector (by Type of Major Industries):domestically licensed banks
Kenya	Commercial banks: distribution of credit facilities: private sector credit to industry, trade and business services
Korea	Financial assets and liabilities outstanding: bank Loans: business Sector
Latvia	Banking and monetary statistics: loans granted by credit institutions: loans to domestic enterprises and private persons: private enterprises
Lithuania	Loads to Non-financial Corporations and Households: Non-financial Corporations
Macedonia	Deposit Money Banks : Total Claims to Enterprises
Malaysia	Loans by Sector: Commercial Banks: Industry, Construction, Business Services (Everything but Consumption Credit)
Mexico	Credit granted by the commercial bank: Enterprises and persons with enterprise activity
Netherlands	Monetary Financial Institutions Loans to the Private Sector: non-financial Corporations

New Zealand	Sector Credit: Resident NZ Claims of registered banks: Agriculture and Business Credit
Pakistan	Classification of Scheduled Banks Advances by Borrower: Industry, Commerce, Construction (Everything but Personal and Other Credit)
Poland	Commercial banks credit to non-financial corporations
Portugal	Domestic credit to non-financial Corporations
Russia	Bulletin of Banking Statistics: Credit extended to Enterprises
Slovak Republic	Analytical Accounts of the Banking Sector: Domestic Credit: Credit to Enterprises
Slovenia	Deposit Money Banks Claims on Domestics Non-Monetary sectors: Claims on Enterprises
South Africa	Total Credit Extended by All Monetary Institutions Net of Household Credit
Sweden	Lending to non-financial enterprises: banks
Switzerland	Lending to companies by company size and type of loan:total
Thailand	Commercial Bank Credit to Industry, construction, Trade and Services
Turkey	Deposit Money Banks Credit to Enterprises
UK	UK resident banks lending to private sector, net of lending to individuals
USA	Commercial Banks Credit: Commercial and Industrial Loans
Uruguay	Commercial Bank Credit to Agriculture, Industry, Commerce and Services

Appendix Table A2. Variables - definitions and sources

Variable	Definition	Source
Bank Credit to GDP	Total outstanding claims of deposit money banks on private sector as ratio to GDP	Beck, Demirgüç-Kunt and Levine (2000)
Enterprise Credit to GDP	Total outstanding claims of deposit money banks on enterprise sector as ratio to GDP	See Appendix Table A1
Household Credit to GDP	Total outstanding claims of deposit money banks on households as ratio to GDP	See Appendix Table A1
GDP per capita growth	Annual average real GDP per capita growth, 1995 to 2005	World Development Indicators (WDI)
Growth of Gini	Annual log change in Gini, averaged over country-specific periods between 1992 and 2005	Beck, Demirguc-Kunt and Levine (2007)
Growth of Lowest Income Share	Annual log change in the income share of poorest quintile, averaged over country-specific periods between 1992 and 2005	Beck, Demirguc-Kunt and Levine (2007)
GDP per capita		WDI
Secondary enrolment	Share of the respective age cohort enrolled in secondary schools	WDI
Government consumption	Total govt. expenditures relative to GDP	WDI
Trade	Ratio of exports and imports to GDP	WDI
Inflation	Average log difference in the Consumer Price Index over the sample period	WDI
Legal origin dummies	Origin country of each country's legal system	La Porta, Lopez-de-Silanes, Shleifer and Vishny (1999)
Catholic, Protestant and Muslim population shares	Share of population with the respective religious belief in total population	La Porta, Lopez-de-Silanes, Shleifer and Vishny (1999)
Interest Rate Spread	Lending rate – borrowing rate	WDI
Savings as Percent of GNI	Gross savings as percent of Gross National Income	WDI
Government Transfers	Subsidies and other transfers	WDI

Figure 1: The relationship between Bank Credit to GDP and GDP per capita growth at different levels of GDP per capita
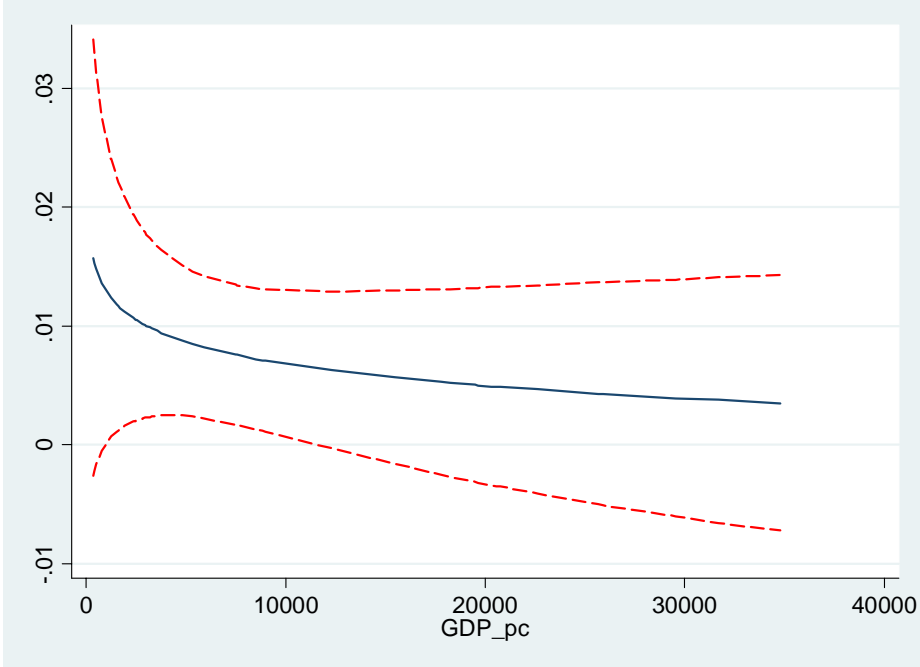
The graph shows the marginal effect of Bank Credit to GDP across different levels of initial GDP per capita. The dotted lines indicate the 95% confidence intervals.

Figure 2: The relationship between Enterprise Credit to GDP and GDP per capita growth at different levels of GDP per capita
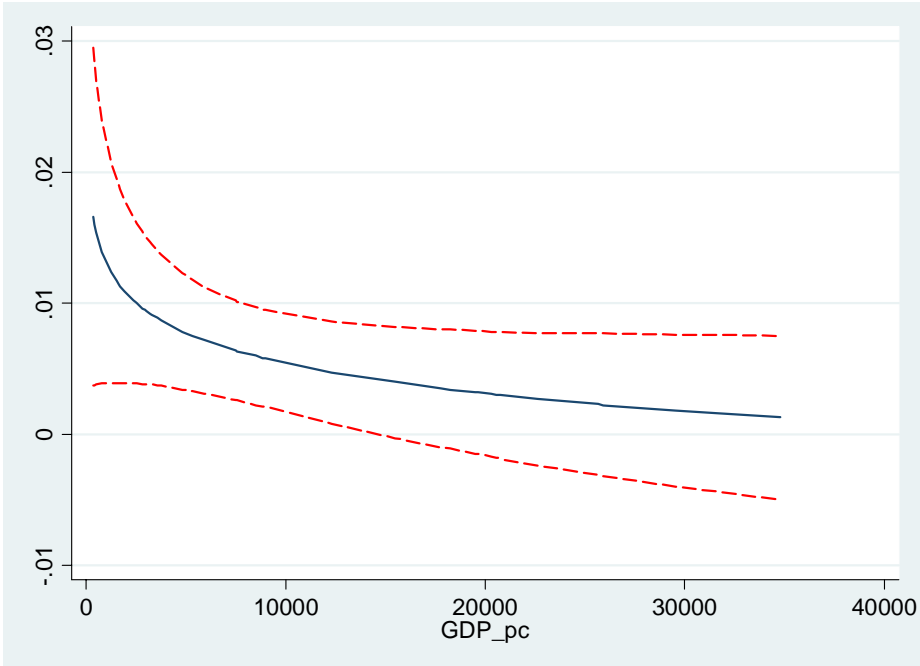
The graph shows the marginal effect of Enterprise Credit to GDP across different levels of initial GDP per capita. The dotted lines indicate the 95% confidence intervals.

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Table 1: Banking sector development and credit composition across countries, 1994-2005

Bank Credit to GDP is total claims of deposit money banks on private domestic non-financial sector as ratio to GDP. Enterprise Credit to GDP is total claims of deposit money banks on enterprises as ratio to GDP. Household Credit to GDP is total claims of deposit money banks on households as ratio to GDP. Enterprise and Household Credit Share are the relative shares in total credit.

	Bank Credit to GDP	Enterprise credit to GDP	Household Credit to GDP	Enterprise Credit Share	Household Credit Share
Argentina	0.212	0.087	0.125	0.410	0.590
Australia	0.823	0.279	0.544	0.339	0.661
Austria	1.005	0.653	0.352	0.650	0.350
Belgium	0.744	0.314	0.430	0.422	0.578
Bulgaria	0.219	0.145	0.075	0.660	0.340
Canada	0.962	0.188	0.773	0.196	0.804
Costa Rica	0.245	0.113	0.132	0.461	0.539
Czech Republic	0.484	0.314	0.171	0.648	0.352
Denmark	0.894	0.133	0.761	0.149	0.851
Egypt	0.446	0.372	0.075	0.833	0.167
Estonia	0.286	0.176	0.111	0.613	0.387
Finland	0.630	0.227	0.403	0.361	0.639
France	0.850	0.339	0.511	0.399	0.601
Germany	1.053	0.653	0.400	0.620	0.380
Greece	0.663	0.379	0.283	0.572	0.428
Hungary	0.231	0.189	0.042	0.820	0.180
Iceland	0.918	0.492	0.426	0.536	0.464
India	0.219	0.156	0.063	0.713	0.287
Indonesia	0.252	0.170	0.082	0.676	0.324
Ireland	1.128	0.704	0.424	0.624	0.376
Jamaica	0.213	0.110	0.103	0.517	0.483
Japan	1.549	1.070	0.479	0.691	0.309
Kenya	0.240	0.190	0.049	0.794	0.206
Korea	0.698	0.313	0.385	0.448	0.552
Latvia	0.199	0.160	0.039	0.805	0.195
Lithuania	0.149	0.104	0.045	0.699	0.301
Macedonia	0.187	0.140	0.046	0.751	0.249
Malaysia	1.278	1.145	0.133	0.896	0.104
Mexico	0.186	0.087	0.099	0.468	0.532
Netherlands	1.639	0.630	1.010	0.384	0.616
New Zealand	1.118	0.703	0.415	0.629	0.371
Pakistan	0.225	0.175	0.050	0.776	0.224
Poland	0.244	0.135	0.110	0.552	0.448
Portugal	1.103	0.507	0.596	0.460	0.540
Russia	0.147	0.114	0.033	0.777	0.223
Slovak Republic	0.415	0.265	0.150	0.638	0.362
Slovenia	0.340	0.240	0.099	0.707	0.293
South Africa	0.625	0.309	0.316	0.494	0.506
Sweden	0.636	0.233	0.402	0.367	0.633
Switzerland	1.603	0.604	1.000	0.377	0.623
Thailand	1.226	1.001	0.225	0.816	0.184
Turkey	0.179	0.115	0.064	0.645	0.355

United Kingdom	1.269	0.557	0.712	0.439	0.561
United States	0.498	0.118	0.380	0.236	0.764
Uruguay	0.392	0.194	0.198	0.495	0.505

Table 2: Correlations

Bank Credit to GDP is total claims of deposit money banks on private domestic non-financial sector as ratio to GDP. Enterprise Credit to GDP is total claims of deposit money banks on enterprises as ratio to GDP. Household Credit to GDP is total claims of deposit money banks on households as ratio to GDP. Enterprise and Household Credit Share are the relative shares in total credit.

Panel A: 45 country sample for growth regressions

	GDP p.c. growth	Log(initial GDP p.c.)	Bank Credit to GDP	Enterprise Credit to GDP	Household Credit to GDP
Log(initial GDP p.c.)	0.012				
Bank Credit to GDP	0.252*	0.668***			
Enterprise Credit to GDP	0.382***	0.349**	0.84***		
Household Credit to GDP	0.031	0.7716***	0.8262***	0.3884***	
Enterprise Credit Share	0.137	-0.680***	-0.271*	0.225	-0.694***

Panel B: 33 country sample for income inequality regressions

	Growth of Gini	Growth of lowest income share	Bank Credit to GDP	Enterprise Credit to GDP	Household Credit to GDP
Growth of lowest income share	-0.596***				
Bank Credit to GDP	-0.470***	0.257			
Enterprise Credit to GDP	-0.495***	0.301*	0.866***		
Household Credit to GDP	-0.264	0.108	0.791***	0.379**	
GDP pc growth	-0.124	0.292*	-0.160	0.292*	-0.653***

Table 3: Enterprise Credit, Household Credit and Economic Growth

Dependent variable is the average annual growth rate of real GDP per capita. Initial income per capita is the log of real GDP per capita in 1994, secondary enrolment is the share of the respective age cohort enrolled in secondary schools, government consumption is total govt. expenditures relative to GDP, Trade is the ratio of exports and imports to GDP, Inflation is the average log difference in the Consumer Price Index over the sample period, Bank Credit to GDP is total claims of deposit money banks on private domestic non-financial sector as ratio to GDP. Enterprise Credit to GDP is total claims of deposit money banks on enterprises as ratio to GDP, Household Credit to GDP is total claims of deposit money banks on households as ratio to GDP. Regressions (1) – (4) are OLS regressions, regression (5) is IV regression, with legal origin and religious composition as excluded exogenous and Enterprise Credit to GDP and Household Credit GDP as endogenous variables. P-values calculated from robust standard errors are reported. *,**,*** indicate significance at the 10%, 5% and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Initial income per capita	-0.002	-0.000	-0.001	-0.001	0.001
	(0.442)	(0.973)	(0.682)	(0.696)	(0.728)
Secondary enrolment	0.000	0.000	0.000	0.000	0.000
	(0.464)	(0.468)	(0.763)	(0.474)	(0.611)
Government consumption	-0.020**	-0.020**	-0.022**	-0.020**	-0.020***
	(0.026)	(0.025)	(0.012)	(0.025)	(0.007)
Trade	0.004	0.004	0.006**	0.004	0.003
	(0.101)	(0.165)	(0.047)	(0.141)	(0.390)
Inflation	0.003	-0.003	-0.012	-0.001	-0.005
	(0.906)	(0.879)	(0.601)	(0.966)	(0.855)
Bank Credit to GDP	0.008***				
	(0.006)				
Enterprise Credit to GDP		0.006***		0.005**	0.008*
		(0.004)		(0.014)	(0.089)
Household Credit to GDP			0.004	0.002	-0.003
			(0.199)	(0.621)	(0.586)
Constant	0.075	0.065	0.074	0.074	0.053
	(0.001)***	(0.002)***	(0.021)**	(0.018)**	(0.144)
Observations	45	45	45	45	45
R-squared	0.333	0.326	0.273	0.331	
Sargan test (p-value)					0.400
F test legal origin (p-value) Enterprise Credit					0.0682*
F test religion (p-value) Enterprise Credit					0.0217**
F test all excluded var.(p-value) Enterprise Credit					0.0089***
F test legal origin (p-value) Household Credit					0.0039***
F test religion (p-value) Household Credit					0.7952
F test all excluded var.(p-value) Household Credit					0.0127**

Table 4: Enterprise Credit, Household Credit and Economic Growth – Robustness Tests

Dependent variables are the average annual growth rate of real GDP per capita, average annual capital per capita growth rate and the average annual productivity per capita growth, computed as GDP per capita growth – 0.3*Capital per capita growth. Initial income per capita is the log of real GDP per capita in 1994, secondary enrolment is the share of the respective age cohort enrolled in secondary schools, government consumption is total govt. expenditures relative to GDP, Trade is the ratio of exports and imports to GDP, Inflation is the average log difference in the Consumer Price Index over the sample period, Bank Credit to GDP is total claims of deposit money banks on private domestic non-financial sector as ratio to GDP. Enterprise Credit to GDP is total claims of deposit money banks on enterprises as ratio to GDP, Household Credit to GDP is total claims of deposit money banks on households as ratio to GDP. Investment ratio is investment relative to GDP and Value Traded to GDP is total value traded on national stock exchanges relative to GDP. P-values calculated from robust standard errors are reported. *,**,*** indicate significance at the 10%, 5% and 1% level, respectively.

	(1)	(2)	(3)	(4)
	GDP per capita growth	GDP per capita growth	Capital per capita growth	Productivity per capita growth
Initial income per capita	-0.001	-0.001		-0.002
	(0.645)	(0.631)		(0.380)
Secondary enrolment	0.000	0.000	0.000	0.000
	(0.356)	(0.626)	(0.784)	(0.577)
Government consumption	-0.019**	-0.016*	-0.014	-0.010
	(0.028)	(0.054)	(0.287)	(0.256)
Trade	0.004*	0.002	0.003	0.003
	(0.099)	(0.571)	(0.466)	(0.144)
Inflation	-0.003	0.006	0.061***	-0.018
	(0.895)	(0.759)	(0.004)	(0.143)
Enterprise Credit to GDP	0.005**	0.004*	0.002	0.005**
	(0.021)	(0.092)	(0.428)	(0.028)**
Household Credit to GDP	0.000	0.003	0.003	-0.001
	(0.983)	(0.444)	(0.637)	(0.754)
Value traded to GDP	0.002**			
	(0.016)			
Investment ratio		0.017		
		(0.117)		
Initial capital per capita			0.004	
			(0.468)	
Constant	0.071**	0.021	0.019	0.050
	(0.017)	(0.606)	(0.749)	(0.142)
Observations	45	45	35	35
R-squared	0.371	0.382	0.232	0.359

Table 5: Enterprise Credit, Household Credit and Economic Growth – Non-linearities

Dependent variable is the average annual growth rate of real GDP per capita. Initial income per capita is the log of real GDP per capita in 1994, secondary enrolment is the share of the respective age cohort enrolled in secondary schools, government consumption is total govt. expenditures relative to GDP, Trade is the ratio of exports and imports to GDP, Inflation is the average log difference in the Consumer Price Index over the sample period, Bank Credit to GDP is total claims of deposit money banks on private domestic non-financial sector as ratio to GDP. Enterprise Credit to GDP is total claims of deposit money banks on enterprises as ratio to GDP, Household Credit to GDP is total claims of deposit money banks on households as ratio to GDP. All regressions are run with OLS and p-values calculated from robust standard errors are reported. *,**,*** indicate significance at the 10%, 5% and 1% level, respectively. The effects of Bank, Enterprise and Household Credit to GDP are evaluated at the 25th, 50th and 75th percentile of initial income per capita using lincom commands in Stata.

	(1)	(2)	(3)
Initial income per capita	-0.004	-0.005	-0.004
	(0.311)	(0.227)	(0.590)
Secondary enrollment	0.000	0.000	0.000
	(0.599)	(0.601)	(0.886)
Government consumption	-0.018*	-0.018*	-0.021**
	(0.059)	(0.057)	(0.024)
Trade	0.003	0.003	0.005
	(0.334)	(0.382)	(0.155)
Inflation	0.004	0.004	-0.014
	(0.869)	(0.855)	(0.557)
Bank Credit to GDP	0.031		
	(0.225)		
Bank Credit to GDP*	-0.003		
Initial income per capita	(0.355)		
Enterprise Credit to GDP		0.036**	
		(0.042)	
Enterprise Credit to GDP*		-0.003*	
Initial income per capita		(0.083)	
Household Credit to GDP			0.017
			(0.496)
Household Credit to GDP*			-0.001
Initial income per capita			(0.599)
Constant	0.097	0.108	0.101
	(0.008)***	(0.001)***	(0.153)
Observations	45	45	45
R-squared	0.355	0.365	0.283
Effect on 25th percentile of initial income	0.010**	0.010***	0.006
Effect on 50th percentile of initial income	0.008***	0.007***	0.005
Effect on 75th percentile of initial income	0.005	0.003	0.003

Table 6: Enterprise Credit, Household Credit and Changes in Income Distribution

Growth of Gini is the annual growth rate in the Gini coefficient, while of lowest income share is the annual growth rate in the income share of the poorest quintile. Initial dependent variable is in logs and for the first year of the respective sample period, secondary enrolment is the share of the respective age cohort enrolled in secondary schools, government consumption is total govt. expenditures relative to GDP, Trade is the ratio of exports and imports to GDP, Inflation is the average log difference in the Consumer Price Index over the sample period, Bank Credit to GDP is total claims of deposit money banks on private domestic non-financial sector as ratio to GDP. Enterprise Credit to GDP is total claims of deposit money banks on enterprises as ratio to GDP, Household Credit to GDP is total claims of deposit money banks on households as ratio to GDP. Regressions (1), (2), (4), and (5) are OLS regressions, while regressions (3) and (6) are IV regressions, with legal origin and religious composition as excluded exogenous and Enterprise Credit to GDP and Household Credit GDP as endogenous variables. P-values calculated from robust standard errors are reported. *,**,*** indicate significance at the 10%, 5% and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Growth of Gini	Growth of Gini	Growth of Gini	Growth lowest income share	Growth lowest income share	Growth lowest income share
Initial dependent variable	-0.020	-0.026	-0.041*	-0.073**	-0.082**	-0.089***
	(0.219)	(0.176)	(0.054)	(0.022)	(0.013)	(0.000)
Secondary enrolment	0.000*	0.000	-0.000	-0.001***	-0.001	-0.000
	(0.071)	(0.220)	(0.906)	(0.006)	(0.157)	(0.962)
Government consumption	-0.012	-0.014	-0.017	0.075***	0.090***	0.095***
	(0.404)	(0.362)	(0.222)	(0.008)	(0.003)	(0.000)
Trade	0.008	0.008	0.010	0.032	0.023	0.016
	(0.448)	(0.479)	(0.469)	(0.191)	(0.265)	(0.496)
Inflation	-0.001***	-0.001***	-0.000	0.001	0.001	-0.000
	(0.001)	(0.002)	(0.472)	(0.282)	(0.213)	(0.832)
Growth in GDP pc	-0.041	-0.028	-0.024	-0.936	-1.109*	-1.146**
	(0.899)	(0.933)	(0.929)	(0.101)	(0.066)	(0.040)
Bank Credit to GDP	-0.029***			0.033		
	(0.001)			(0.113)		
Enterprise Credit to GDP		-0.019**	-0.020*		0.042**	0.050**
		(0.042)	(0.096)		(0.044)	(0.023)
Household Credit to GDP		-0.009	0.005		-0.006	-0.042**
		(0.212)	(0.685)		(0.738)	(0.031)
Constant	0.028	0.042	0.144	-0.061	-0.056	-0.132
	(0.766)	(0.692)	(0.173)	(0.613)	(0.566)	(0.144)
Observations	33	33	33	33	33	33
R-squared	0.428	0.445		0.540	0.611	
F-test 1st stage (p-value) Enterprise Credit			0.043			0.021
F-test 1st stage (p-value) Household Credit			0.001			0.001
Sargan test (p-value)			0.421			0.362

Table 7: Enterprise Credit, Household Credit and Excess Consumption Sensitivity
The dependent variable is the excess consumption sensitivity, estimated by country with quarterly data on income and consumption as described in section 3.3. The Interest Rate Spread is the difference between the lending and deposits interest rates, Savings as Percent of GNI are national savings over Gross National Income, Government Transfers are transfers plus other safety net payments as percent of GDP, Bank Credit to GDP is total claims of deposit money banks on private domestic non-financial sector as ratio to GDP, Enterprise Credit to GDP is total claims of deposit money banks on enterprises as ratio to GDP, Household Credit to GDP is total claims of deposit money banks on households as ratio to GDP. Regressions (1) – (3) are OLS regressions, regression (4) is IV regression, with legal origin and religious composition as excluded exogenous and Enterprise Credit to GDP and Household Credit GDP as endogenous variables. P-values calculated from robust standard errors are reported.*,**, *** indicate significance at the 10%, 5% and the 1% level, respectively.

	(1)	(2)	(3)	(4)
Bank Credit to GDP	-0.080			
	(0.591)			
Household Credit to GDP		-0.492	-0.432	0.007
		(0.0.040)**	(0.007)***	(0.986)
Enterprise Credit to GDP		0.212	0.206	-0.279
		(0.260)	(0.101)	(0.547)
Interest Rate Spread			0.006	0.006
			(0.599)	(0.862)
Savings to GNI			0.011*	0.009
			(0.070)	(0.549)
Government Transfers to GDP			0.001	0.004
			(0.874)	(0.637)
Constant	0.791	0.814	0.425	0.732
	(0.000)***	(0.000)***	(0.061)*	(0.252)
Observations	31	31	27	27
R-squared	0.01	0.14	0.54	
Sargan test (p-value)				0.332
F-test 1st stage (p-value) Enterprise Credit				0.003***
F-test 1st stage (p-value) Household Credit				0.123