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Abstract

Despite their importance, data on the structure of bank credit by maturity are scarce. For Latin America and the Caribbean, data are particularly difficult to obtain, as few banks report loan maturity data in commercial data sets such as Bankscope. With support from the Association of Supervisors of Banks of the Americas, this study assembled a novel data set on the structure of bank credit allocation in Latin America and the Caribbean covering 21 countries during 2004–14. This paper uses Bankscope and International Financial Statistics data to extended the coverage to more than 100 countries, creating the largest data set so far on credit by maturity. Benchmarking credit structure in Latin America and the Caribbean, the paper finds that the region is financially underdeveloped, because the ratio of short-term credit to gross domestic product is lower than in peers; long-term credit is at par; and consumer and commercial loans are lower. The paper also explores patterns of credit growth through nonparametric regressions. The results indicate that short-term credit grows faster than long-term credit as income grows in low-income countries, but the situation reverses when countries reach high- or middle-income status. Reflecting this trend, the share of mortgage loans rises with income.

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Bank Credit Allocation in Latin America and the Caribbean

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1. Introduction

The scarcity of long-term credit in developing market economies is recognized as an obstacle to productivity growth and a source of volatility that further hampers growth. Investments across infrastructure, factories, equipment, new housing, commercial business, education, and research and development are all necessary to expand the productivity frontier. Firms and households need to fund these investments through financial markets. The scarcity of long-term credit is one of the most important impediments to the operations of firms in emerging markets; rollover risks prevent borrowers from undertaking long-term investments with short-term loans, which in turn negatively affects productivity (Almeida et al. 2011; Demirgüç-Kunt and Maksimovic 1998; Jaramillo and Schiantarelli 2002; Schiantarelli and Sembenelli 1997; Schiantarelli and Srivastava 1997). Scarcity of long-term financing has also been argued to increase the pro-cyclicality of investment, amplifying macroeconomic volatility and lowering growth. According to the 2014 Financial Development Barometer, 75 percent of respondents indicated that the low usage of long-term finance in their countries was primarily a supply problem.[2]

The recent economic growth performance of the countries in Latin America and the Caribbean (LAC) has been hampered by poor productivity growth. Even in countries that experienced strong economic growth over the past decade, such as Colombia or Peru, factor accumulation rather than productivity gains was the main driver of growth. While many factors explain the poor productivity and growth performance in the region, lack of financial development, particularly long-term credit, has been identified as a particular problem in LAC (CEPAL 2006; de la Torre, Ize, and Schmukler 2012). However, there is no comprehensive data set on the credit maturity of financing in LAC that can be used to explore the trends, determinants, and effects of long-term credit.

Banking systems are the main providers of long-term financing to the private sector around the world. Long-term funding is typically defined as debt (loans or bonds) with maturity of over one year (following the definition of fixed investment in national accounts). The Group of 20 countries (G-20, 2013) defines long-term fund, however, as debt with maturity of over five years. Equity, as it is not immediately repayable, can also be considered as long-term finance. Firms

[2] Financial Development Barometer. www.worldbank.org/financialdevelopment.

around the world obtain most of their financing to fund fixed assets from banks, regardless of their size. Although firms in high-income countries raise more long-term financing and debt from capital markets than firms in developing countries, over 60 percent of their investments are financed by bank loans. [3] Households' main long-term investment, housing, is also overwhelmingly financed by banks. Capital markets, however, may be an important indirect source of long-term financing to the extent that they fund banks' provision of long-term credit. This is done either through purchases of long-term bank bonds and equity or through investments in long-term deposits in the case of pension funds and insurance companies.

Despite the importance of long-term finance, data on bank loan maturity are scarce, and particularly so for LAC. Bankscope, a commonly used provider of financial information including bank balance sheets, does not have an adequate coverage of loan maturity for the region.[4] In 2004, only 2 percent of the total loans originated by reporting banks in LAC included information on the maturity of these loans. This Bankscope reporting share has increased to 18 percent (as of September 2015), but LAC is still the region with the lowest data coverage on loan maturity. In contrast, the reporting share ranges between 50 percent and 56 percent in all other regions, except for Middle East and North Africa (MNA) where only 22 percent of loans include maturity data. While the European Central Bank Data Warehouse provides data on loan by maturity for European Union countries, no equivalent data set exits for LAC countries.[5] Orbis, a data set on firm balance sheets, contains information on the maturity of firms' bank debt, but the coverage is also low for LAC. For example, less than 30 firms report annual bank debt maturity data in countries such as Chile, Peru, and Mexico during 2004–2014 (Demirguc-Kunt, Peria, and Tressel 2015).

Many financial supervisory authorities in LAC do not publicly publish loan maturity data; however, most authorities report loan by purpose/borrower (that is, consumer, mortgage, commercial, financial sector, or government entities). To the extent that consumer lending is mostly short-term (below five years maturity in most countries) and mortgage is long-term, looking at data by purpose of loan provides some useful information about loan maturity. Further,

[3] The Global Financial Development Report 2015, World Bank.
[4] This database has historically been provided by Bureau van Dijk using data supplied by Fitch. In December 2016, Bureau van Dijk and Fitch parted ways. The data used in this paper were sourced before the separation.
[5] European Central Bank (ECB) Data Warehouse website: http://sdw.ecb.europa.eu/.

as not all types of credit may have the same impact on productivity and growth or financial stability, looking at data by purpose, regardless of maturity, is of interest to policy makers.

The main purpose of this paper is to construct a data set on the structure of bank credit allocation in LAC. In partnership with the Association of Supervisors of Banks of the Americas (ASBA), we circulated a survey on individual bank loan portfolio composition and maturity. For the countries that did not respond to the survey, we used publicly available data from bank supervisory authorities or central banks. In total, we assembled data for 21 countries in the region across 2004–2014 using data from supervisory sources. To compare the credit allocation structure in LAC to that of other regions, we compiled data from Bankscope. We then calculated the shares (over total loans) of loans by maturity and purpose of credit obtained from these sources, and then multiplied these shares to International Financial Statistics (IFS) credit data to obtain credit volumes. In all, we constructed data on credit by maturity for 107 countries and on credit by purpose for 103 countries. To our knowledge, this is the most comprehensive cross-country data set on bank loan by maturity.

Armed with these data, we analyzed patterns and trends of bank credit allocation across regions and we explored how these patterns differ in LAC. Benchmarking the credit structure in LAC, we found that LAC is financially underdeveloped because short-term credit to gross domestic product (GDP) is lower than in peers, while long-term credit is at par with peers. In terms of loan by purpose, consumer and commercial loans are lower in LAC. We also explored patterns of credit growth through nonparametric regressions. The results indicate that short-term credit grows faster than long-term credit as income grows in low-income countries, but the situation reverses when countries reach high- or middle-income status. Reflecting this trend, mortgage loan share rises with income. Econometric analysis of the determinants of long-term credit around the world and in LAC is left for future work. However, a simple correlation analysis indicates that stable macroeconomic environments and sound political and institutional factors are associated with more long-term credit and mortgages, in line with results in the empirical literature. In addition, in line with previous empirical studies, foreign and public (government) bank ownership is negatively correlated with credit depth. Foreign ownership negatively affects short- and medium-term credit but not long-term credit, while public (government) ownership is more negatively correlated to medium- and long-term credit.

Our paper is related to a recent series of papers that build new data sets with a view to improve understanding on the evolution of financial deepening (Dembiermont, Drehmann, and Muksakunratana 2013; Jordà, Schularick, and Taylor 2016; Müller 2017). These show that the main driver of the rapid growth in private credit to income in advanced economies since World War II is the rise of household credit, mostly of mortgages. Over time, credit to households has increased faster than corporate credit in both developing and developed countries. Further, in many countries the amount of credit to households has surpassed credit to corporations. In developing countries, consumer credit is the main driver of household credit growth, while mortgages play a more prominent role in developed countries. Our data set cannot verify such long-term trends, but our paper explores credit structure by maturity as well as credit by purpose and delves into the differences in the allocation across regions and income levels with an emphasis on understanding these patterns in LAC.

Our work is also related to the empirical literature on the determinants of financial development and on the determinants of long-term credit in particular. Several papers have explored the effect of the quality of institutions (La Porta et al. 1997; Beck, Demirgüç-Kunt, and Levine 2003), cultural factors (Stulz and Williamson 2003), political economy considerations (Rajan and Zingales 2003), and geography on the degree of financial development. Macroeconomic factors have also been found to have a positive effect including maintaining low inflation (Boyd et al. 2001) as well as trade openness (Baltagi, Demetriades, and Law 2009) and financial liberalization (Chinn and Ito 2006) albeit the latter is not without risks (Demirgüç-Kunt and Detragiache 1998).

Many papers have also explored the effect that those same variables have on the provision on long-term credit, which is thought to be particularly susceptible to macroeconomic and institutional environment (Booth 2001; Caprio 1997; Demirgüç-Kunt 1999; Fan 2012).[6] Due to the lack of comprehensive data on bank credit maturity, most studies use firm balance sheet data. These papers, in general, find that macroeconomic stability and the quality of institutions (with a

[6] In the presence of uncertainty about the true quality of the borrower due to information asymmetries and macroeconomic and political volatility and when enforcing debt collection is cumbersome due to weak legal systems and creditor rights, lenders will be more prone to monitoring and disciplining borrowers through short-term contracts.

particular focus on financial infrastructure features such as creditor rights and credit information systems) are associated with more credit and more long-term credit.

Estimating the effect of institutional variables is problematic due to endogeneity challenges. This is because countries with higher financial development tend to also have better-quality institutions and, in particular, better financial infrastructure. However, some studies have established causality by exploiting changes in the quality of financial infrastructure and found that better financial infrastructure is associated with credit as well as more long-term credit (Djankov, McLiesh, and Shleifer 2007; Gopalan 2014; Love 2013; Peria and Singh 2014).

Our paper is also related to the few papers that explore the determinants of long-term credit using aggregated bank balance sheet data. Using cross-country data on bank loan maturity, Valev and Tasić (2008) find that the share of long-term credit is higher in countries with strong institutions, low inflation, large financial markets, and credit information systems. However, they did not find any effect of bank concentration on debt maturity. In a second paper on the determinants of long-term finance, Tasić and Valev (2010) confirm the positive effects of the political and institutional environment, the rate of inflation, the levels of economic and financial development, and the establishment of credit information sharing institutions. While bank privatization is associated with higher long-term debt, the share of foreign-owned banks and banking sector competition have no influence on credit maturity. Gbenyo and Kpodar (2010) find that macroeconomic stability, a creditor-friendly environment, political stability, and the availability of long-term financial resources are factors that encourage banks to provide long-term financing to firms.

The rest of the paper is organized as follows. Section 2 discusses the data and section 3 explores the representativeness of the data. Section 4 describes the patterns of credit allocation in LAC and compares it with that of countries elsewhere. Section 5 explores what factors are associated to the patterns of credit allocation and to what extent these factors affect LAC countries on a different way than in other countries. Section 6 provides conclusions.

2. Data Description

A. LAC data

In partnership with ASBA, a data request was sent to all the LAC bank supervisors that are ASBA members. The request sought to collect bank-level information on the maturity profile and purpose of loans (that is, commercial, consumer, and mortgage) to the nonfinancial sector. The questionnaire also requested information on bank balance sheet items including information on other loan characteristics such as the currency of denomination and the size or structure of liabilities. Information on profit and loss accounts as well as financial indicators and bank ownership was also requested.[7] The information was requested on an annual basis from 2000 to 2015.

Sixteen LAC countries responded to the survey.[8] While some supervisors provided bank-level information, others provided aggregated information by bank type; for example, Panama provided information across domestic and foreign banks. In terms of the variables requested, overall, the response varied by countries. All countries reported loans by sector, albeit not all countries reported the data across the whole period (for example, Chile only provided annual data starting from 2008). Nine countries provided data on maturity composition, with four countries reporting data on maturity under and beyond one year (maturity pairs), while the rest reported data under one year, between one and five years and over five years (maturity triples). Countries reported remaining loan maturity data, except for Uruguay that reported original loan maturity.

To improve the coverage of countries in our data set, publicly available data on loan maturity and purpose of loans were collected from the websites of central banks and banking supervisory authorities for seven additional countries. In cases where information was not reported in those websites, information was obtained from the notes in the individual bank's annual financial statements, available on the individual bank's websites. Maturity data refer to total loans granted by banks, including loans to financial corporations and the public sector. Data on loans by purpose were constructed by aggregating sectoral loan information to compute commercial loans (for example, loans to agriculture, commerce, manufacturing, consumer, mortgage, government,

[7] See questionnaire in annex 1.
[8] Cayman Islands responded to the questionnaire but did not provide data by maturity or loan purpose. British Virgin Islands (BVI) provided comprehensive data; since there is no corresponding IFS or World Development Indicators (WDI) data for BVI, the data set does not include BVI.

and other). Commercial loans thus constructed exclude loans to financial institutions and government, so total credit in this case refers to credit to the nonfinancial private sector. To complete the loans by purpose data, consumer and mortgage loans data were readily available as separate line items.

Armed with these data, we constructed a country-level data set on the shares (over total loans) of bank loans by sectoral distribution and loan maturity, aggregating individual bank data provided in the survey, or using aggregate data publicly available from websites. These shares are defined by dividing a particular maturity or credit purpose value by the total reported credit in a country for a given year. In the case of individual bank data provided by ASBA, the shares were calculated by aggregating total gross loans to the nonfinancial sector by purpose/maturity and dividing by the sum of the aggregates by sector/maturity so the shares add up to one.[9]

Bank-level information included information from all supervised institutions, including public banks. Some of these public banks are development financial institutions focused on providing long-term finance directly to borrowers or by lending long-term funds to private commercial funds. To avoid overestimating the share of long-term lending, second-tier operations or wholesale funding by public banks were excluded from the aggregation.[10] Data obtained directly from supervisors' website were already aggregated at the banking sector level and should net out public sector lending on second-tier basis to avoid double counting of loans. In the cases where data were obtained from the notes to individual bank statements (available in PDF), information was obtained only for the top three or four largest banks in the country, constructing the country share as the share aggregating the information on those banks. Country-level observations with less than five years of available data were excluded from the data set. **Error! Reference source not found.** shows the details on country-year observations for the shares of loans by maturity and by purpose. Table 2 expands on how the information was calculated.

To obtain information on the U.S. dollar amount of bank loan portfolios by maturity and purpose, we multiplied the shares constructed as described earlier by the IFS Domestic Private

[9] In almost all the cases, the sum within a country-year of the total of the three categories of loan purpose or the total of the two or three maturity groupings was smaller than the sum of total gross loans to the nonfinancial sector. The difference was small and averaged 92.4 percent for the constructed purpose total over the reported total and 96.6 percent for the constructed maturity total over the reported total.

[10] For Argentina's BICE, Brazil's BNDES, Chile's Banco Estado and Nicaragua's Banco Produzcamos credit data are for their direct loans only.

Credit to Non-Financial Sector by Financial Corporations. This is the most widely used variable to measure credit to the private sector; however, information on maturity or sectoral distribution of credit is not available in IFS. Hence, our aim was to expand the information content of IFS data using the data collected with ASBA as described earlier. These IFS data are provided in either a standardized format or a non-standardized format.[11] Increasingly, more and more countries are providing data in the standardized format. There is a total of five types of claims of Other Depository Corporations that IFS collects.[12] These are domestic claims to the nonfinancial private sector, domestic claims to other financial corporations, domestic claims to state and local governments, domestic claims to public nonfinancial corporations, and domestic claims to other sectors. The main variable that is used here is the domestic credit to the nonfinancial private sector.[13]

Our data differ from IFS data on three important dimensions. First, the IFS domestic credit to the nonfinancial private sector includes not only loans but also purchases of non-equity securities and other accounts receivable. Second, financial corporations include, in addition to deposit money banks, monetary authorities as well as other financial corporations.[14] Third, credit from supervisory data includes credit granted both to residents and nonresidents while IFS focuses on credit to residents. Credit volumes were normalized by GDP using World Economic Outlook (WEO) data from the International Monetary Fund (IMF).

To further complement our data, we used Bankscope data for those countries for which information from supervisory sources was not found, following the procedure described for rest of

[11] The standardized report form (SRF) for monetary data reporting to the IMF was first introduced in 2004. Form SRF 2SR is for Other Depository Corporations. The main difference between the standardized and the non-standardized format is that the financial institution groupings in the non-standardized format are defined locally and the line items reported for each financial institution grouping are not necessarily comparable for every country.

[12] The data on domestic credit provided to the private sector are taken from banking institutions (line 22D) of the IMF's IFS or, when unavailable, from its monetary survey (line 32D).

[13] Domestic credit to the private sector refers to financial resources provided to the private sector by financial corporations, such as through loans, purchases of non-equity securities, and trade credits and other accounts receivable, which establish a claim for repayment. For some countries, these claims include credit to public enterprises. The financial corporations include monetary authorities and deposit money banks, as well as other financial corporations where data are available (including corporations that do not accept transferable deposits but do incur such liabilities as time and savings deposits). Examples of other financial corporations are finance and leasing companies, money lenders, insurance corporations, pension funds, and foreign exchange companies.

[14] Other financial corporations include those institutions that do not accept transferable deposits but do incur such liabilities as time and savings deposits. Examples of other financial corporations are finance and leasing companies, money lenders, insurance corporations, pension funds, and foreign exchange companies. The data on domestic credit provided to the private sector are taken from the financial corporations survey (line 52D) of the IMF's IFS or, when unavailable, from its depository survey (line 32D).

the world data in section 2.B. In this way, we extended the coverage of loan maturity and loan purpose to 107 and 103 countries, respectively.

B. Rest of the World Data

Data for the rest of the world are obtained from Bankscope, a database that reports balance sheet and income statements for more than 30,000 global financial institutions. Information on loan maturity is provided for loans to banks and loans to customers. Customers include government agencies, public companies, households, and individuals. Maturity is reported in four categories: up to 3 months, 3–12 months, 1–5 years, and more than 5 years. Loan by purpose data are available across five categories: loans to customers for residential mortgage loans, other mortgage loans, other consumer loans, corporate and commercial loans, and other loans (which includes loans to governments and to financial companies). To make the Bankscope data comparable with data obtained for LAC, a combined maturity category for loans with up to 12 months maturity was created by summing the first two maturity categories. Similarly, residential and other mortgage loans were combined into a single mortgage series.

Data, on an annual basis, were downloaded from 2004 onward.[15] To construct country-level aggregates, we used banks' consolidated statements when available, following Duprey and Lé (2016), which include loans provided by foreign subsidiaries. Each global financial institution has a different fiscal year. Thus, to construct an annual series, Bankscope assigns different fiscal years to different calendar years. There is no interpolation involved, but a consistent assignment of closing quarters or months is mapped to the calendar year, so that data are comparable year over year. There is some error that is introduced because of this bottom-up approach. However, the method used to construct the final data set is designed to reduce this error, and further comparisons with national data suggest that the error is small.

Across the 11 years of the Bankscope data (2004–2014) the panel of financial institution data is not strongly balanced. For both the loan maturity and the loan purpose data, there is a total of just over 210,000 observations (financial institution - years). Therefore, the average financial

[15] The raw Bankscope data were downloaded in October 2015. Given the large size of the data, data were downloaded from 2004 onward. Similarly, a separate download script was written for the loan maturity and the loan sector database. The loan maturity file yielded a total of 33,593 global financial institutions' statements, while the loan sector file also yielded a total of 33,593 global financial institutions' statements.

institution has data for 6.7 years. This is due to a number of factors. The first is that the number of financial institutions around the world is increasing, and therefore, the entry of new financial institutions contributes to a non-balanced panel. Similarly, bank closure or merger of banks will also contribute to this feature of the data. Finally, the number of reporting banks to the Bankscope data service also changes, and this is the final contributor to the non-balanced panel.

A concern when computing country aggregates generated by Bankscope is that the data may not be representative of a country's financial sector for a variety of reasons. First is that not all banks in a country report to Bankscope. Second is that not all financial institutions that report to Bankscope provide information on loan maturity or loan purpose data. For example, in 2014, there were 121 reporting financial institutions from Brazil. However, only 93 of these banks reported loan maturity information and 89 reported loan sector data. Given that maturity data from Bankscope include loans to the public sector, to assess the representativeness of Bankscope-constructed data, we compared them to total IFS credit.[16] For consistency, we also compared Bankscope aggregates by purpose of loan including the 'other category' to total IFS credit including credit to public agencies. However, it is important to note that Bankscope credit includes credit to nonresidents while IFS only focuses on domestic credit. Hence, international financial centers' representativeness may be overestimated even if not all banks report loan maturity or purpose distribution, given that those reporting this information will have a large number of loans to nonresidents.

The bottom-up exercise to construct country-representative maturity and purpose of loan data involved a number of key steps. The first was the ranking algorithm for the various consolidation formats of financial institutions' financial statements. After summing all the reporting maturity and sector loans for a country-year, this was then followed by a country-year inclusion threshold based on country IFS data. We then filtered representative country-years by maturity and purpose of credit ensuring they represented at least 30 percent of IFS All Counterparties credit and provided that this yielded at least three observations for a country.[17]

[16] Defined as the sum of domestic claims to the nonfinancial private sector, domestic claims to other financial corporations, domestic claims to state and local governments, domestic claims to public nonfinancial corporations, and domestic claims to other sectors.

[17] In the case of LAC countries for which supervisory data from the ASBA survey or authorities' website were not available, we required five years of data.

After this, the third step was to construct within Bankscope maturity (purpose of credit) shares by country-year and apply these to the IFS domestic private credit to the nonfinancial sector.

In the case of loan maturity, we aggregated loans to customers (which include loans to public sector and nonbank financial corporations) across banks for a given maturity bracket and divided by the total sum of loans to customers reported by all banks. In the case of purpose of loans, we aggregated loans to customers for commercial purposes (excluding other category) or consumer or mortgage to the sum of total loans to customers (excluding other category) reported by banks.[18] Multiplying these shares by IFS credit to the nonfinancial private sector, we obtained the U.S. dollar credit exposures by maturity and loan purpose. Finally, these were normalized by GDP to get a credit share of credit by maturity or purpose over GDP.

We decided to consider a country aggregate as representative if the sum of credit reported by maturity or loan distribution in Bankscope was at least 30 percent of the IFS total credit value for that year. Figures and Tables

Figure 1 shows the density plots where each observation is a country-year for both these threshold values (maturity and purpose) as well as the location for the selected cutoff of 0.30. These cumulative density graphs (the first panel of the graph) show that for both maturity and purpose, this is equivalent to the top 55 percent of country-years. The probability distribution graphs show that there are a number of countries with a threshold above 1—which means that these country-years from Bankscope most likely include loans to non-domestic counterparties and also public agencies.

A subsequent criterion is to count the number of years of data that this threshold yields for each country for both maturity and for purpose. Countries with less than three years of data for a country (not necessarily continuous years) are dropped. With the selected threshold and the country count criteria, the loan purpose data set contains 539 country-years and the loan maturity contains 565 country-years. The earlier discussion summarizes the criteria that are imposed to admit a particular country-year from the Bankscope database into the final global sector and maturity loan database. Using this criterion, **Error! Reference source not found.**3 summarizes

[18] The implicit assumption with this approach is that the other Bankscope category does not contain a significant portion of loans to the domestic private nonfinancial sector. Further, omitting the other category from the sector threshold calculation is a conservative approach as it reduces the size of the total Bankscope sector universe.

the coverage of the Bankscope financial institutions with maturity and purpose of credit information and the final number of countries, by region, that surpass the mentioned criteria.[19] The region and country classification data are from the World Bank.[20]

The total number of countries in the raw sample in 2014 is 160; therefore, the maturity loan data only have 51 percent country coverage while the loan purpose data have 52 percent. As can be seen earlier, the country coverage improves dramatically between 2004 and 2009. Overall, the country coverage for high income is the best for both maturity and purpose of loan data. This is followed by Europe and Central Asia (ECA) and Africa (AFR) for maturity and ECA and LAC for loan purpose. As can be seen, the LAC maturity coverage is very poor, and this was the primary reason for embarking on the World Bank-ASBA questionnaire. The first rows of **Error! Reference source not found.**3 show that almost double the number of financial institutions report loan sector data; however, this difference does not mirror the country coverage as much as the difference is likely within countries above the 30 percent representative threshold and not across countries.

3. Representativeness

The data set assembled in the paper uses information on loan shares by maturity and purpose obtained from supervisory sources and Bankscope to disaggregate IFS data on credit to the nonfinancial private sector. The data set is constructed using a variety of sources for which the credit definition or the universe of reporting entities does not coincide with IFS credit to the nonfinancial private sector. Hence, it is important to compare the data we used to calculate the shares of credit by maturity and loan purpose with IFS credit data to assess the overall representativeness of the data produced.

Figure 2 shows the representativeness of the maturity and loan purpose data. For the maturity data, the top dark blue line is the total credit in trillions of U.S. dollars over the sample period. The line below that is the same volume data, but only for the country-years that are present in our data. The red line is the constructed data for maturity pairs while the yellow line is the actual data for maturity triples. The sampling within countries—which is equivalent to the red line divided by the light blue line—averages 97 percent. However, it is much lower from 2009 onward

[19] Three LAC countries (The Bahamas, Chile, and Uruguay) that are classified as High Income are reclassified to LAC.
[20] https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups.

as Bankscope coverage improves over time, while the sampling across countries—which is equivalent to the red line divided by the dark blue line—averages 44 percent over the sample. Therefore, about half of the gap is coming from a lack of complete country coverage. This is partly due to the absence of the United States and Japan in the maturity data.

For credit data, the sampling is better. This is because Bankscope has much better coverage of purpose of credit data than maturity of credit data. The within-country sampling is 99 percent, and the across-country sampling is 60 percent. Therefore, for the purpose data, most of the gap is from countries that are absent from the reporting sources, rather than countries in the sample reporting less credit in the sources used than in IFS.

4. Credit Allocation in LAC and around the World

Figure 3 compares the mean value of credit by different maturity groupings (maturity triples and doubles) as share of GDP at two points in time for different regions in the world according to the World Bank regional classification. Given few country observations for Sub-Saharan African countries, MNA countries, and South Asian (SAR) countries, observations for countries in those regions have been grouped in the 'other' region category. Outliers are addressed by dropping the top and bottom one percentile of credit measures across countries and within years.

The data reveal that in all regions, the average share of long-term loans (as measured by loans over one year) is higher than the share of short-term lending. Credit over GDP has grown over time in all regions except in high-income countries reflecting the effects of the global financial crisis and the great recession. Short-term credit was particularly affected in high-income countries. When splitting maturity into triplets (second panel of the graph), we see that the share of midterm-credit tends to be greater than the share of long-term lending except for LAC and high-income countries. The share of credit beyond five years has increased in all regions except for high-income countries. Overall, LAC compares favorably to other developing regions in terms of the share of long-term credit (particularly beyond five-year maturity) but seems to have less short-term credit to GDP than other regions. This result holds if median values (by region) are used instead of means.

Analysis of the share of credit by purpose of credit (Figure 4) reveals that in all regions, commercial credit has the largest share followed by consumer credit and mortgages. In recent years, despite the mortgage crisis in the United States and some European countries, overall

mortgage lending has increased its share in high-income countries and now exceeds consumer credit. This appears to contradict the maturity data that show a decline in the share of longer-term credit, but it may be due to the different sample coverage. The decline in the share of consumer lending in high-income countries confirms the decrease in short-term lending observed in the maturity data. The share of commercial and consumer loans appears to be particularly low in LAC compared to other regions.

To further explore how the patterns of credit allocation differ in LAC with respect to countries elsewhere, we conducted a benchmarking analysis. Assuming that financial development (X) depends on economic development (Y), policy variables (P), and structural characteristics (Z) and that economic development depends on lagged policy variables, which are autocorrelated in time, in the reduced form, we can benchmark using only economic, development, and external factors.

$$X_{,t} = \alpha Y_t + \beta P_{,t,} + \gamma Z_t + \varepsilon_t \qquad (1)$$

$$Y_{,t} = \alpha' P_{t,} + \beta' P_{t-1,} \gamma' Z_t + \varepsilon'_t \qquad (2)$$

$$P_{,t} = \alpha'' P_{t-1,} + \upsilon_t \qquad (3)$$

$$X_{,t=}(\alpha + \frac{\beta\alpha''}{\alpha' + \alpha'' \beta'}) Y_t + (\gamma - \frac{\beta\alpha''\gamma'}{\alpha' + \alpha'' \beta'}) Z_t + \varepsilon_t - \frac{\alpha''}{\alpha' + \alpha'' \beta'} \varepsilon'_t + \frac{\beta\beta'}{\alpha' + \alpha'' \beta'} \upsilon_t \qquad (4)$$

We estimated equation 4, regressing the share of credit to GDP on a regional LAC dummy and other structural factors found to explain financial development and excluding outliers as previously defined. We followed de la Torre, Feyen, and Ize (2013) and included population, population density (people per square kilometer of land area), age dependency ratio (old and young) as percentage of working-age population, and inflation (annual percentage) in the structural variables. Dummies to control for offshore financial centers, transition economies, and oil exporters are also included.[21] While endogeneity of GDP per capita and credit to GDP results in

[21] GDP per capita is obtained from IMF WEO. Source for total population, population density, age-dependency ratios, and inflation is the World Bank WDI. The offshore dummy takes a value 1 for all years if the country is an offshore center and zero otherwise based on the IMF classification. The transition country dummy takes a value of 1 for all years if the country is a transition country and zero otherwise based on FinStats. The fuel exporter dummy takes a value of 1 for all years if the country's average fuel exports as fraction of exports is in the 75th percentile or higher in the world distribution and zero otherwise based on World Bank WDI.

biased estimates of the GDP per capita coefficient and other coefficients correlated with it, we focus on the coefficient of the LAC dummy, which should not be affected by this.

The results (Table 4) confirm the well-documented fact that LAC is financially underdeveloped given its income level in terms of share of credit to GDP (de la Torre, Ize, and Schmukler et al 2012). This is true for total credit (column 1) as well as short-term credit (column 5) and credit over one year (column 6). However, when looking at longer-term credit (beyond five years), we found that financial development in LAC is in line with peers (column 5). In line with these findings, when exploring development credit by purpose, we found that LAC is underdeveloped in terms of commercial and consumer credit (columns 7 and 8) but not in terms or mortgage credit (column 9).[22]

To explore how patterns of credit allocation evolve with income, we used nonparametric regressions (Fan 1992). The approach first divides the support of the dependent variable (either total credit or credit by maturity or purpose) onto a grid of fixed width. For each point on the grid, a weighted linear regression with country fixed effects is run on log per capita GDP. The weights for the regression depend on the distribution of the independent variable and seek to estimate a local linear effect at each point on the grid. Repeating this for each grid point produces a continuous nonlinear function between credit and log per capita GDP. Standard errors are generated by bootstrapping and using these replications to construct confidence intervals at each point on the grid.

There are several important assumptions for this estimation strategy, in particular the applicability of the Gaussian weighting function and also the bandwidth to control the smoothing. Several other approaches were employed, including quantile regression and trimming outliers to ensure that the final specifications shown in the following paragraphs are robust.

The results are depicted in Figure 5. The results indicate that the relation between credit to GDP and per capita income is quite linear for low- and middle-income countries, but when countries reach high-income status, credit to GDP grows much faster than per capita GDP. This

[22] These results are even stronger if we regress credit over GDP over the level of GDP per capita and the LAC dummy alone. In this case, credit over one year is no longer underdeveloped in LAC and credit over five years is larger than in peers. Results were also similar when regressing credit volume over the level of GDP per capita and the LAC dummy.

result is in line with the findings of Jordà, Schularick, and Taylor (2016) who document a rapid growth in credit to GDP in developed countries.

Long-term lending (beyond one year) grows faster than short-term lending in upper-middle-income and high-income countries but not for low-income countries. In the latter countries, income growth has a higher effect on the share of short-term credit to GDP. Hence, the composition of credit by maturity varies considerably with income. For low-income and lower-middle-income countries, the share of short-term credit to GDP is similar to the share of long-term lending (loans beyond one year). When countries reach upper-middle-income status, the share of long-term credit is clearly larger.

When analyzing credit by purpose, commercial loans are more sensitive to income growth than consumer or mortgage loans, growing particularly faster in low-income countries as well as in high-income countries. For low-income countries, the share of consumer credit to GDP appears to actually decline as per capita income grows, but the trend turns positive after countries reach low-middle-income status. Mortgage lending only reaches 10 percent of GDP for high-income countries. In contrast, loans with maturity of over five years reach a 10 percent share of GDP in higher-middle-income countries indicating that commercial and even consumer loans in these countries have maturities over five years. Reflecting these patterns, consumer loans are the largest portfolio in low-income countries, but commercial lending becomes quickly the largest portfolio as income levels grow and the country reaches low-middle-income status.[23]

5. Factors Associated with Credit Allocation

Finally, we explore the relationship between factors that have been found to be related with the provision of credit to the data set constructed here of credit allocation by maturity and purpose using correlation analysis. While recognizing the shortcomings of this simplistic approach, it can provide insights to motivate further work. **Error! Reference source not found.** lists the source of the variables used for this analysis. Table 6 presents the correlation analysis between macroeconomic, governance, financial structure, and financial infrastructure variables and the

[23] As long-term credit grows faster with income, the share of mortgage credit in some countries becomes even larger than the share of commercial lending as documented by Müller (2017).

share of credit to GDP by maturity. The correlation analysis is performed for different samples including all countries, high-income countries, developing countries, and LAC countries.

The correlation analysis confirms previous findings in the literature. Higher income levels, lower inflation, more voice and accountability, and more political stability are associated with higher credit to GDP, especially long-term credit (over one year). Trade openness is also associated with higher credit levels, with a similar effect on short- and long-term credit, through its association in medium-term credit (1–5 years). High nonperforming loans (NPLs) are negatively associated with the provision of longer-term credit (over five years).

Higher income level seems to be more associated with long-term credit (over five years) in developing countries than in high-income countries, pointing to nonlinear effects. Patterns of association in LAC are similar to those of other developing countries. However, higher per capita income and better voice and accountability do not seem to be associated with high share of long-term credit in LAC.

Turning our attention to financial sector variables, higher domestic savings mobilization, higher strength of legal rights, and more depth of credit information seem to be associated with larger shares of credit and particularly long-term credit, in line with the empirical literature.[24] Depth of credit information, however, does not seem to have the same positive association to long-term credit as other regions.

Foreign ownership and public sector (government) ownership are associated with lower shares of credit to GDP, as found in the literature.[25] Domestic banks have soft informational advantage over foreign banks that may have trouble analyzing opaque firms. Hence, it is argued that firms in developing countries that lack strong credit information infrastructure and good accounting practices may have lower access to credit after the entrance of foreign banks. In addition, as foreign banks are more efficient and focus on lending to the largest and most profitable borrowers, their presence could be destabilizing for domestic banks. This can cause overall credit levels, or at least credit access for some market segments, to reduce. Greater foreign bank presence can also reduce competition and hence credit levels when foreign banks enter through mergers and

[24] See discussion in the introduction on the empirical literature on determinants of long-term credit.
[25] See, for example, Cull, Peria, and Verrier (2018) for a recent review on the empirical literature on the effects of public and foreign ownership.

acquisitions (rather than greenfield investments). We found that foreign ownership seems to be particularly detrimental for credit under five-years' maturity, while more government bank ownership is associated with lower credit share to GDP or longer-term credit (over five years). The negative association between government ownership and long-term credit is particularly large for LAC.

Table 7 repeats the correlation analysis focusing this time on the share of credit by purpose. The results confirm the patterns of association discussed earlier between macroeconomic, governance variables, and financial variables and credit to GDP. Overall effects seem similar for all types of credit, albeit higher government ownership is negatively associated with consumer and mortgage credit but not to commercial credit. Overall, relationships in LAC are similar to those elsewhere with the exception of depth of credit information, which is negatively correlated with all types of credit. In addition, NPLs appear particularly detrimental to credit levels in LAC.

6. Conclusions

Despite their importance, data on the structure of bank credit by maturity are scarce. For LAC in particular, data are particularly difficult to obtain as few banks report loan maturity data to commercial data sets such as Bankscope. With the support of ASBA, we assembled a novel data set on the structure of bank credit allocation in LAC covering 21 countries during 2004–2014. Exploiting this information and combining it with Bankscope data for the rest of the world, we constructed a data set on shares of credit by maturity, which we then applied to IFS data and normalized by GDP to obtain a data set on IFS credit to GDP by maturity and loan purpose.

The lack of long-term credit for investment purposes has long been identified as a factor hampering growth in LAC. However, we found that LAC is financially underdeveloped because short-term credit to GDP is lower than in countries with similar income levels, while long-term credit is at par. In terms of loan by purpose, the shares of consumer and commercial loans to GDP are lower in LAC than other regions.

Certainly, more long-term credit, particularly for commercial purposes, could foster higher growth in LAC. However, while it does not appear that overall access to long-term credit is worse in LAC than in peer countries, short-term credit seems to be more limited. Reflecting on this pattern, consumer and commercial lending are lower in LAC but mortgage lending appears in line

given the income. Banks in some large countries like Mexico and Colombia offer limited mortgage financing, but when considering a wider set of LAC countries, mortgage lending compares favorably to peers. Lower commercial and consumer credit underlines the problems of access to finance for micro, small, and medium enterprises that abound in LAC. The smaller firms, largely informal, frequently use consumer loans to fund working capital needs. This finding is corroborated by the Enterprise Surveys, which show that small and medium firms in LAC cite finance as a major obstacle to doing business, and the corresponding numbers for the world, especially East Asia and the Pacific (EAP) and ECA, for small- and medium-size firms are much lower.[26]

We also found that the relationship between credit by maturity and purpose is nonlinear. In low-income countries, short-term credit grows faster than long-term credit as income grows but the situation reverses when countries reach upper-middle-income status. Consumer lending grows faster with income in low-income countries. As countries develop, commercial loan growth accelerates while mortgage growth accelerates only when countries reach high-income status.

The results of the simple correlation analysis conducted in this paper are consistent with previous findings. Long-term credit is associated with sound macroeconomic frameworks, higher income levels, higher savings mobilization, and good financial infrastructure and legal frameworks. Regarding bank ownership, the negative association between credit levels and foreign banks found in the literature seems to be driven by medium- and short-term credit. On the other hand, the negative association between public (government) bank ownership and credit levels seems to be driven by long-term credit (over five years). Focusing on LAC, patterns of association are similar to other countries in other developing regions except in the case of depth of credit information.

While these results are suggestive, additional work is necessary to properly identify patterns of association and causality effects between macroeconomic and financial variables and long-term credit around the world and in LAC. Bayesian Model Averaging (BMA) and General-to-specific (Gets) approaches can be used in a cross-country framework to address missing variable bias. A cross-country panel data introducing country dummies could also be used provided there

[26] Enterprise Surveys 2018.

is enough variability on the institutional variables to identify their effect. To deal with endogeneity, a generalized method of moments (GMM) approach can be adopted. Alternatively, individual bank balance sheet data can be used to explore the effect that bank characteristics have on different types of credit (that is, bank capitalization, NPLs, and funding structure) pooling bank panel data for different countries and using country-year time effects to control for policy variables.

7. Figures and Tables

Figure 1. Density Plots for Maturity and Sector Threshold

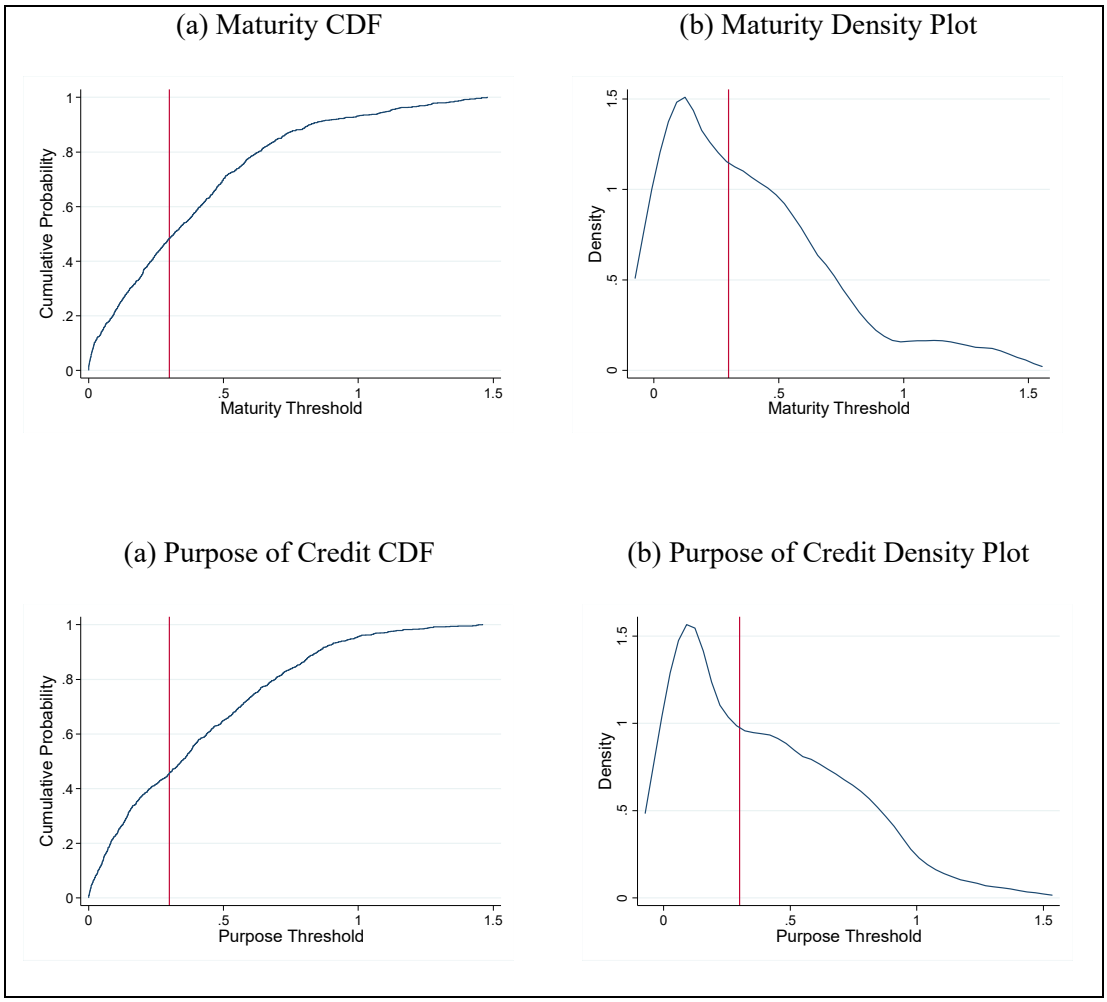


Figure 2. Data Representativeness

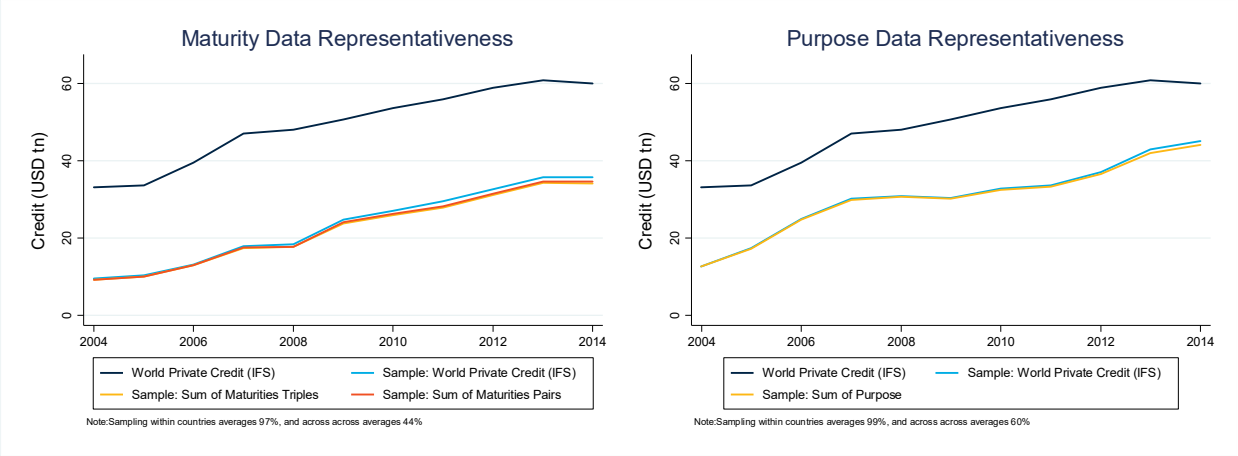
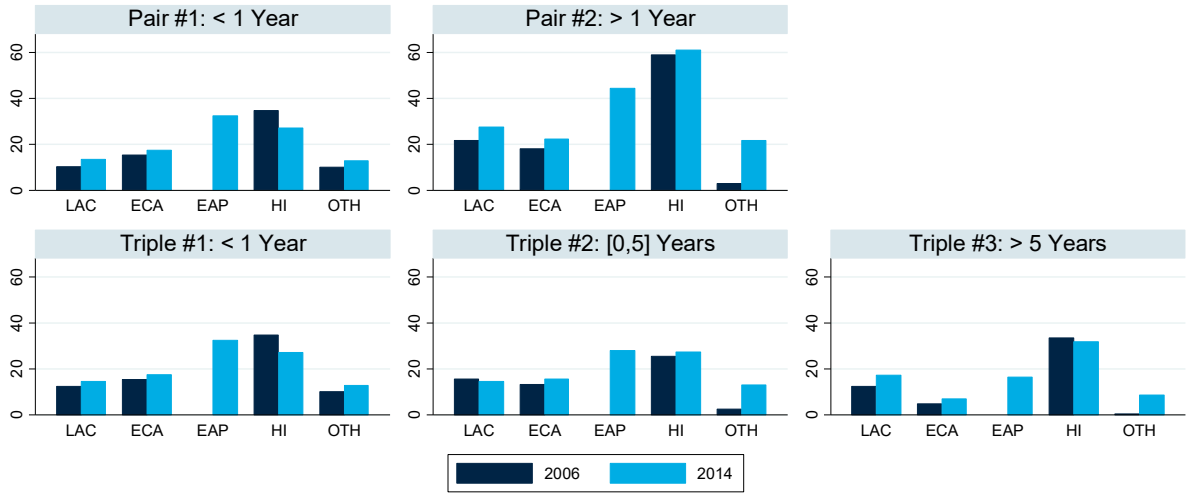
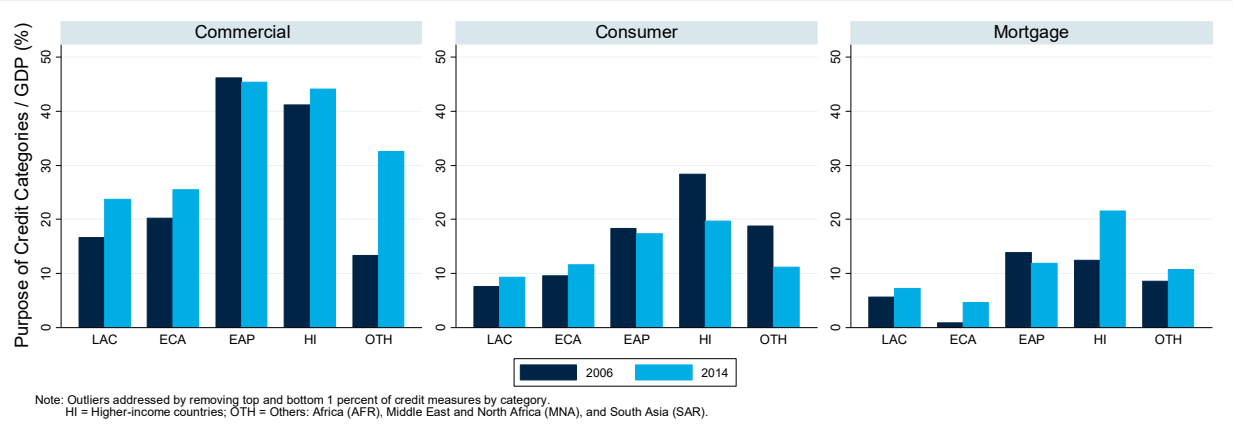


Figure 3. Mean Value of Bank Credit by Maturity Bracket as Share of GDP



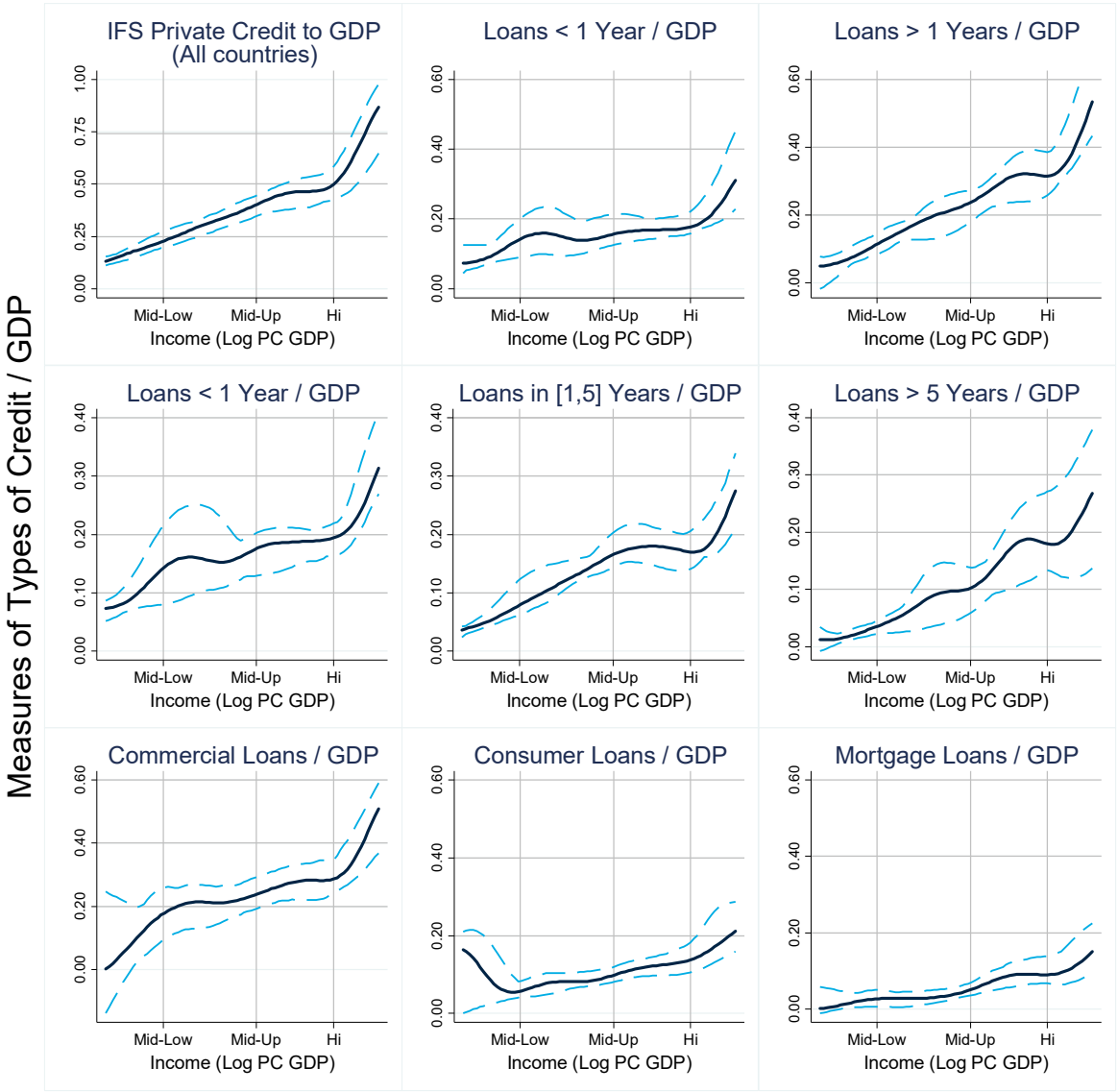
Note: Outliers addressed by removing top and bottom 1 percent of credit measures by category.
HI = Higher-income countries; OTH = Others: Africa (AFR), Middle East and North Africa (MNA), and South Asia (SAR).

Figure 4. Mean Value of Bank Credit by Use of Credit as Share of GDP



Note: Outliers addressed by removing top and bottom 1 percent of credit measures by category.
HI = Higher-income countries; OTH = Others: Africa (AFR), Middle East and North Africa (MNA), and South Asia (SAR).

Figure 5. Non-parametric Estimates of Type of Credit to GDP on Log of Per Capita GDP



Note: PC GDP = Per capita GDP.

Table 1. Country-year Observations in the Data Set and Origin of Credit Share Data

	Maturity											Purpose										
Country	**04**	**05**	**06**	**07**	**08**	**09**	**10**	**11**	**12**	**13**	**14**	**04**	**05**	**06**	**07**	**08**	**09**	**10**	**11**	**12**	**13**	**14**
Albania						B	B	B	B	B	B								B	B	B	B
Argentina	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Armenia						B	B	B	B	B	B			B		B	B	B	B	B	B	B
Austria		B	B	B	B	B	B	B	B	B	B		B	B	B	B	B	B	B	B	B	B
Azerbaijan												B	B	B	B	B	B	B	B	B	B	B
Bahamas, The						B	B	B	B	B	B											
Bahrain		B	B	B	B	B	B	B	B	B	B		B	B	B	B					B	B
Bangladesh									B	B	B	B	B	B	B							
Belgium												B	B	B	B	B	B	B			B	
Belize												A	A	A	A	A	A	A	A	A	A	A
Bolivia												A	A	A	A	A	A	A	A	A	A	A
Bosnia and Herzegovina						B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Botswana					B	B	B	B	B	B	B									B	B	B
Brazil	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Brunei Darussalam																				B	B	B
Bulgaria	B	B	B					B		B	B	B	B	B	B	B	B	B	B	B	B	B
Burundi									B	B	B											
Cabo Verde					B	B	B	B	B	B	B											
Cambodia					B	B	B	B	B	B	B					B	B	B	B	B	B	B
Chile						B	B	B	B	B	B					A	A	A	A	A	A	A
China				B	B	B	B	B	B	B	B			B	B	B	B	B	B	B	B	B
Colombia		A	A	A	A	A	A	A	A	A	A		A	A	A	A	A	A	A	A	A	A
Costa Rica		W	W	W	W	W	W	W	W	W	W			W	W	W	W	W	W	W	W	W
Croatia	B							B		B	B				B	B	B	B	B	B	B	B
Cyprus			B	B	B	B	B	B	B	B	B					B	B		B	B	B	B
Czech Republic			B	B	B	B	B	B	B	B	B			B		B	B	B	B	B	B	B
Denmark	B	B	B	B	B	B	B	B	B	B	B											
Dominican Republic					W	W	W	W	W	W	W			W	W	W	W	W	W	W	W	W
ECCU	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
Ecuador												A	A	A	A	A	A	A	A	A	A	A
Egypt, Arab Rep.																				B	B	B
El Salvador	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Estonia		B	B			B	B		B	B	B					B	B	B	B	B		
Finland	B	B	B	B	B	B	B	B	B	B	B			B	B		B	B		B	B	B
France						B	B	B	B	B	B											
Georgia	B	B	B		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Germany	B	B	B	B	B	B	B	B	B	B	B											
Ghana						B			B	B	B											
Greece		B	B				B		B	B	B		B	B	B	B	B	B	B	B	B	B
Guatemala					A	A	A	A	A	A	A					A	A	A	A	A	A	A
Haiti																						
Honduras							A	A	A	A	A											
Hong Kong SAR, China		B	B	B	B	B	B	B	B	B	B		B	B	B	B	B	B	B	B	B	B
Hungary	B	B							B	B			B	B	B	B	B	B	B	B	B	B
Iceland		B	B	B	B					B				B		B			B	B	B	B
Indonesia																		B	B	B	B	
Ireland			B		B	B	B	B	B	B	B				B	B	B	B	B	B	B	B
Israel																B	B	B	B	B	B	B
Jamaica												W	W	W	W	W	W	W	W	W	W	W
Jordan						B	B	B	B	B	B						B	B		B	B	B
Kazakhstan		B	B	B	B	B		B	B	B	B		B	B	B	B	B	B	B	B	B	B
Kenya								B	B	B	B											
Korea, Rep.												B	B	B	B	B	B	B	B	B	B	B
Kuwait		B	B		B	B	B	B	B	B	B					B	B	B	B	B	B	B
Kyrgyz Republic							B	B	B	B	B								B	B	B	B
Lebanon																			B	B	B	B
Liberia							B	B		B												
Luxembourg	B	B	B	B	B	B	B	B	B	B	B						B	B	B	B	B	B
Macedonia, FYR						B	B	B								B		B	B	B	B	B
Malawi					B	B	B	B	B	B	B											
Malaysia						B	B	B	B	B	B			B	B	B	B	B	B	B	B	B

	Maturity											Purpose										
Country	**04**	**05**	**06**	**07**	**08**	**09**	**10**	**11**	**12**	**13**	**14**	**04**	**05**	**06**	**07**	**08**	**09**	**10**	**11**	**12**	**13**	**14**
Malta					B	B				B	B											
Mauritius					B	B	B	B	B	B	B						B	B	B	B	B	B
Mexico						W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
Micronesia, Fed. Sts.													B	B	B	B	B	B	B	B	B	B
Moldova					B	B	B	B	B	B						B	B	B	B	B	B	B
Mongolia					B	B	B		B	B	B						B		B	B	B	B
Montenegro		B					B	B		B	B								B	B	B	B
Morocco												B	B	B	B							
Namibia					B	B	B	B	B	B	B			B							B	B
Netherlands	B	B	B					B	B	B	B		B	B	B	B	B	B			B	B
Nicaragua				A	A	A	A	A	A	A	A				A	A	A	A	A	A	A	A
Nigeria						B	B				B	B	B	B								B
Norway							B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Oman			B	B	B	B	B	B	B	B	B		B	B	B	B	B	B	B	B	B	B
Pakistan						B	B	B	B	B	B											
Panama	B	B	B			B	B	B	B	B	B	A	A	A	A	A	A	A	A	A	A	A
Papua New Guinea					B	B	B	B	B	B	B											
Paraguay																		W	W	W	W	W
Peru	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Philippines																	B	B	B	B	B	B
Poland	B	B	B	B	B	B	B	B	B	B	B					B	B	B	B	B	B	B
Portugal			B	B					B	B	B		B	B	B	B	B	B	B	B	B	B
Qatar						B	B	B	B	B	B											
Romania	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Russian Federation													B	B	B	B	B	B	B	B	B	B
Rwanda						B	B	B	B	B	B											
Saudi Arabia						B	B	B	B	B	B		B	B	B	B	B	B	B	B	B	B
Serbia						B	B	B	B	B	B						B			B	B	B
Seychelles																						
Singapore		B	B	B	B	B	B	B	B	B	B		B	B	B	B	B	B	B	B	B	B
Slovak Republic		B	B	B	B			B	B	B	B			B	B	B	B	B	B	B	B	B
Slovenia	B	B	B			B	B			B	B	B	B	B	B	B	B	B	B	B	B	B
South Africa		B		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Spain													B	B	B	B						B
Swaziland					B	B	B	B		B	B											
Sweden	B	B	B	B	B	B	B	B	B	B	B			B	B	B	B	B	B	B	B	B
Switzerland	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Tajikistan					B	B	B	B	B	B												
Tanzania								B	B		B											
Togo		B	B	B																		
Trinidad and Tobago					B	B	B	B	B	B		W	W	W	W	W	W	W	W	W	W	W
Turkey		B	B		B	B	B	B	B	B	B		B	B	B	B	B	B	B	B	B	B
Uganda					B	B	B	B	B	B												
Ukraine		B	B	B	B	B	B	B	B	B	B		B	B	B	B	B	B	B	B	B	B
United Arab Emirates		B	B		B	B	B	B	B	B	B					B	B	B	B	B	B	B
United Kingdom	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
United States												B	B	B	B	B	B	B	B	B	B	B
Uruguay	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Vanuatu					B	B	B	B	B	B	B											
Venezuela, RB																B	B	B	B	B	B	B
Vietnam						B	B	B		B	B								B	B	B	B

Note: A = ASBA-World Bank Data; B = Bankscope; ECCU = Eastern Caribbean Currency Union; W = Website of Supervisors and Central Banks.

Table 2. Summary of Data Construction

	Sample Coverage	Threshold Filter	IFS Variable for Volumes	IFS Coverage
ASBA				
Maturity	D, X	Country Obs. >= 5	IFS DPCNFS	D
Purpose	D, X	Country Obs. >= 5	IFS DPCNFS	D
Websites				
Maturity	D, X	Country Obs >= 5[1]	IFS DPCNFS	D
Purpose	D, X	Country Obs >= 5[1]	IFS DPCNFS	D
Bankscope				
Maturity	D, F, P X	> 30% of IFS AC and Country Obs. >= 3	IFS AC	D, F, P X
Purpose	D, X	> 30% of IFS AC and Country Obs. >= 3	IFS AC	D, F, P X

Note: Sample coverage codes: D: Domestic Private Credit to Non-Financial Sector. F: Financial Companies, P: Public Sector, X: Foreign;
IFS Codes: IFS DPCNFS: IFS Domestic Private Credit to Non-Financial Sector, IFS AC: IFS All Counterparties;
[1] For some website data, a sample of bank data was used which comprised more than 70 percent of total assets (for example, Costa Rica).

Table 3. Bankscope Loan Maturity and Sector Representativeness

	Loan Maturity Data			Loan Purpose Data		
	2004	**2009**	**2014**	**2004**	**2009**	**2014**
Financial Institutions (FIs) Coverage (Raw Data)						
Number FI	12,532	20,142	17,506	12,518	20,144	17,528
Number FI w/ Data	2,685	3,706	4,022	5,547	10,605	9,540
% FI Coverage	21%	18%	23%	44%	53%	54%
Country Coverage Counts after Criteria						
Total	**19**	**63**	**71**	**19**	**52**	**67**
AFR	0	12	13	2	2	7
EAP	0	7	7	0	6	7
ECA	6	13	14	5	14	18
HI	12	23	28	7	27	31
LAC	1	5	4	3	2	1
MNA	0	2	1	1	1	3
SAR	0	1	4	1	0	0

Table 4. Regression Results

	Total	Maturity					Purpose		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	TOT/GDP	<1Y/GDP	1-5Y/GDP	>5Y/GDP	P:<1Y/GDP	P:>1Y/GDP	COMM/GDP	CONS/GDP	MORT/GDP
LAC	-0.63***	-0.42*	-0.36*	-0.06	-0.80***	-0.75***	-0.77***	-0.64***	-0.50
	(-4.20)	(-2.45)	(-2.40)	(-0.16)	(-3.62)	(-3.64)	(-4.55)	(-3.41)	(-1.38)
Log GDP PC	0.61	0.22	1.41***	1.48	0.00	1.47**	1.14	0.44	0.39
	(1.59)	(0.51)	(3.91)	(1.45)	(0.01)	(2.94)	(1.32)	(0.42)	(0.25)
Log GDP PC Sq	-0.03	-0.01	-0.08***	-0.08	0.00	-0.07**	-0.07	-0.02	-0.01
	(-1.57)	(-0.48)	(-3.85)	(-1.42)	(0.04)	(-2.73)	(-1.44)	(-0.34)	(-0.07)
Log Pop	0.01	0.07+	0.04	-0.03	0.09+	-0.00	-0.02	-0.04	0.08
	(0.25)	(1.90)	(1.00)	(-0.39)	(1.77)	(-0.04)	(-0.39)	(-0.88)	(1.22)
Log Pop Density	-0.06	-0.02	-0.03	-0.25	-0.05	-0.01	-0.09	-0.09+	0.03
	(-1.28)	(-0.35)	(-0.72)	(-1.49)	(-0.80)	(-0.28)	(-1.66)	(-1.67)	(0.43)
Log Age-Dep Young	-0.99***	-0.92***	-0.76***	-1.18*	-1.02***	-0.68**	-1.17***	-0.81**	0.27
	(-5.18)	(-4.36)	(-4.70)	(-2.07)	(-4.16)	(-3.14)	(-4.25)	(-2.82)	(0.58)
Log Age-Dep Old	0.18*	0.15	0.20**	0.54+	0.09	0.35***	0.09	-0.07	0.58*
	(2.15)	(1.51)	(2.99)	(1.86)	(0.76)	(4.23)	(0.87)	(-0.49)	(2.25)
Offshore Center	0.40*	0.43*	0.53***	0.31	0.47+	0.30	0.36+	0.16	0.77*
	(2.21)	(2.04)	(3.42)	(0.74)	(1.80)	(1.44)	(1.70)	(0.63)	(2.20)
Transition Economy	-0.94***	-0.82***	-0.76***	-1.77***	-0.76***	-0.98***	-0.97***	-0.59*	-0.80+
	(-6.43)	(-3.71)	(-5.30)	(-4.39)	(-3.60)	(-7.12)	(-4.83)	(-2.39)	(-1.83)
Pct Fuel Exports	-0.07	0.01	0.03	-0.75	-0.01	0.03	-0.06	-0.17	-0.45
	(-0.53)	(0.07)	(0.23)	(-1.28)	(-0.05)	(0.19)	(-0.39)	(-0.93)	(-1.62)
Constant	0.09	0.19	-5.90**	-4.83	1.76	-6.58*	-1.40	-0.74	-8.47
	(0.04)	(0.08)	(-2.91)	(-0.74)	(0.57)	(-2.30)	(-0.34)	(-0.15)	(-1.12)
Observations	691	559	559	545	618	618	663	663	597
R^2	0.63	0.54	0.61	0.45	0.55	0.68	0.51	0.39	0.39
Countries	99	81	81	81	87	87	83	84	81
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

All dependent variables are in logs. t statistics in parentheses, + p<0.10, * p<0.05, ** p<0.01, *** p<0.001. Standard errors clustered by country.
Outliers addressed by removing top and bottom 1 percent of dependent variables

Table 5. Data Sources for Macroeconomic and Financial Variables

Variable Name	Source	Series Name
LN GDPPC	IMF WEO	GDP per Capita, Current Prices, U.S. Dollars
Inflation % change	IMF WEO	Inflation, End-of-period Consumer Prices, Percent Change
Voice and Account.	World Bank Governance Project	Voice and Accountability
Political Stability	World Bank Governance Project	Political Stability and Absence of Violence/Terrorism
Trade/GDP	WB WDI	Trade (% of GDP)
Dom. Deposits / GDP	World Bank FinStats	Domestic Bank Deposits/GDP, Data from International Financial Statistics
Foreign Own.	Cull, Peria, and Verrier 2018	Foreign Ownership, Percent
Gov. Ownership	Cull, Peria, and Verrier 2018	Government Ownership, Percent
NPLs / Total Loans	IMF Financial Soundness Indicators	Deposit Takers, Asset Quality, Non-Performing Loans to Total Gross Loans, Percent
3 Bank Asset Conc.	World Bank FinStats	3 – Bank Asset Concentration, Data from Bankscope
Strength legal rights	World Bank Doing Business	Getting Credit Strength of Legal Rights Index
Depth credit info.	World Bank Doing Business	Getting Credit Depth of Credit Information Index

Table 6. Maturity Categories Correlations

	Less than 1 year				More than 1 year				Less 1 year				1 to 5 years				More than 5 years			
Variable name	**World**	**HI**	**Developing**	**LAC**	**World**	**HI**	**Developing**	**LAC**	**World**	**HI**	**Developing**	**LAC**	**World**	**HI**	**Developing**	**LAC**	**World**	**HI**	**Developing**	**LAC**
LN GDPPC	0.41	0.50	0.39	0.47	0.55	0.51	0.66	0.26	0.41	0.50	0.39	0.47	0.46	0.50	0.60		0.38	0.23	0.61	
Inflation % Change	-0.24		-0.25		-0.44	-0.19	-0.40	-0.42	-0.24		-0.25		-0.32		-0.36		-0.38	-0.27	-0.38	-0.36
Voice and Account.	0.18		0.20	0.47	0.35	0.19	0.48		0.18		0.20	0.47	0.25		0.42		0.41	0.40	0.48	
Political Stability	0.25		0.17	0.20	0.37		0.44		0.25		0.17	0.20	0.29		0.39		0.30		0.45	0.27
Trade/GDP	0.15	-0.28	0.28	0.23	0.13	-0.34	0.27	0.46	0.15	-0.28	0.28	0.23	0.12	-0.27	0.31	0.36		-0.24	0.13	0.37
Dom. Deposits/GDP	0.65	0.58	0.64	0.31	0.73	0.45	0.75	0.50	0.65	0.58	0.64	0.31	0.70	0.68	0.67	0.36	0.32	-0.15	0.71	0.46
Foreign Own.	-0.26	-0.24	-0.31		-0.19	-0.18		-0.26	-0.26	-0.24	-0.31		-0.18	-0.24						-0.21
Gov. Ownership			-0.31	0.29	-0.18	-0.16	-0.23	-0.29			-0.31	0.29	-0.11		-0.32		-0.17	-0.21		-0.42
NPLs/Total Loans								-0.38									-0.16		-0.24	-0.47
3 Bank Asset Conc.	0.08		-0.30		0.13		-0.22		0.08		-0.30			0.14	-0.28			-0.15		
Strength Legal Rights	0.10				0.19	0.26		0.30	0.10				0.10				0.19	0.35		0.30
Depth Credit Info.	0.10	0.13	0.33		0.21	0.29	0.50	-0.53	0.10	0.13	0.33		0.26	0.24	0.46		0.20	0.20	0.43	-0.62
No. of observations	657	246	265	146	657	246	265	146	657	246	265	146	631	246	265	120	594	244	251	99
No. of countries	90	30	43	17	90	30	43	17	90	30	43	17	90	30	43	17	89	30	43	16

Note: Variables as % of GDP. Only significant correlations are shown. HI is High Income

Table 7. Purpose of Credit Correlations

	Consumer				Commercial				Mortgage			
Variable name	World	HI	Developing	LAC	World	HI	Developing	LAC	World	HI	Developing	LAC
LN GDPPC	0.34	0.23	0.34	0.28	0.41	0.38	0.46		0.37	0.3	0.33	0.18
Inflation % Change	-0.28		-0.27	-0.21	-0.28		-0.24	-0.24	-0.29		-0.33	-0.23
Voice and Account.	0.16		0.36	0.14	0.14				0.41	0.22	0.43	0.32
Political Stability	0.23		0.35		0.18				0.3		0.33	0.28
Trade/GDP	0.13	-0.31	0.19	0.52	0.15	-0.29	0.23	0.38		-0.2		0.52
Dom. Deposits/GDP	0.51	0.2	0.42		0.67	0.5	0.63		0.59	0.43	0.54	
Foreign Ownership	-0.18	-0.29	0.24	-0.55	-0.19			-0.41				-0.35
Gov. Ownership	-0.17		-0.33						-0.15	-0.16		
NPLs/Total Loans				-0.34				-0.33				-0.54
3 Bank Asset Conc.	0.11				0.17				0.26		0.19	0.34
Strength Legal Rights	0.21		0.24		0.13		-0.14		0.25	0.24	0.19	
Depth Credit Info.	0.1	0.24	0.37	-0.59		0.17	0.37	-0.56	0.21	0.28	0.43	-0.75
No. of observations	714	261	248	205	714	261	248	205	633	214	214	205
No. of countries	88	31	36	21	88	31	36	21	84	29	34	21

Note: Variables as percentage of GDP. Only significant correlations are shown.

8. Annex 1. World Bank-ASBA Questionnaire

Data Format	
Reporting Institutions:	Commercial banks, public banks, development banks, cooperatives, and credit unions (and any other supervised institutions that are not financing institutions)
Frequency:	Annual, end of calendar year
Period:	Annual from 2000 to 2015
Level of aggregation:	Financial institution level
Storage format:	*.txt, *.csv, *.xls, *.xlsx

Balance Sheet

- Total Assets
- Total Gross Loans
  - Total Gross Loans to the Non-financial Sector
    - Gross Commercial Loans
      - Industry
        - Manufacturing
        - Commerce
        - Services
        - Agriculture
        - Construction (excluding Mortgages)
        - Other
      - By Firm Size
        - Self-employed
        - Micro
        - Small
        - Medium
        - Large
      - By Loan Size (All Currencies)
        - Less than US$100,000
        - More than US$100,000
      - In Local Currency
      - In Foreign Currency
      - Fixed Interest Rate
      - Floating Interest Rate
      - Past-due Loans (90 Days)
      - Restructured Loans
      - Written-off Loans in Past 12 Months
    - Gross Mortgages
      - In Local Currency
      - In Foreign Currency
      - Fixed Interest Rate
      - Floating Interest Rate
      - Past-due Loans (90 Days)
      - Restructured Loans
      - Written-off Loans in Past 12 Months
    - Gross Consumer Loans (excluding Mortgages)
      - By Loan Size (All Currencies)
        - Less than US$100,000

More than US$100,000
In Local Currency
In Foreign Currency
Fixed Interest Rate
Floating Interest Rate
Past-due Loans (90 Days)
Restructured Loans
Written-off Loans in Past 12 Months
Gross Loans with Remaining Maturity < 1 Year
In Local Currency
In Foreign Currency
Fixed Interest Rate
Floating Interest Rate
Gross Loans with Remaining Maturity > 1 Year and < 3 Years
In Local Currency
In Foreign Currency
Fixed Interest Rate
Floating Interest Rate
Gross Loans with Remaining Maturity > 3 Years and < 5 Years
In Local Currency
In Foreign Currency
Fixed Interest Rate
Floating Interest Rate
Gross Loans with Remaining Maturity > 5 Years
In Local Currency
In Foreign Currency
Fixed Interest Rate
Floating Interest Rate
Gross Loans with Original Maturity < 1 Year
In Local Currency
In Foreign Currency
Fixed Interest Rate
Floating Interest Rate
Gross Loans with Original Maturity > 1 Year and < 3 Years
In Local Currency
In Foreign Currency
Fixed Interest Rate
Floating Interest Rate
Gross Loans with Original Maturity > 3 Years and < 5 Years
In Local Currency
In Foreign Currency
Fixed Interest Rate
Floating Interest Rate
Gross Loans with Original Maturity > 5 Years
In Local Currency
In Foreign Currency
Fixed Interest Rate
Floating Interest Rate

Total Liabilities
Customer Deposits - Current

Customer Deposits - Savings
Customer Deposits - Term
Bonds Issued (Senior Debt and Subordinated Debt)
Deposits from Banks
Repos and Cash Collateral
Liabilities with Remaining Maturity < 1 Year
Liabilities with Remaining Maturity > 1 Year and < 3 Years
Liabilities with Remaining Maturity > 3 Years and < 5 Years
Liabilities with Remaining Maturity > 5 Years
Liabilities with Original Maturity < 1 Year
Liabilities with Original Maturity > 1 Year and < 3 Years
Liabilities with Original Maturity > 3 Years and < 5 Years
Liabilities with Original Maturity > 5 Years

Total Equity
Core Tier 1 Equity
Paid-in Capital

Income Statement
Interest Expense
Interest Income
Net Interest Income
Net Income

Interest Rates
Weighted Interest Rate on Gross Loans
Weighted Interest Rate on Gross Commercial Loans
Weighted Interest Rate on Gross Commercial Loans less than US$100,000
Weighted Interest Rate on Gross Commercial Loans more than US$100,000
Weighted Interest Rate on Gross Mortgages
Weighted Interest Rate on Gross Consumer Loans
Weighted Interest Rate on Gross Consumer Loans less than US$100,000
Weighted Interest Rate on Gross Consumer Loans more than US$100,000
Weighted Interest Rate on Gross Loans with Remaining Maturity < 1 Year
Weighted Interest Rate on Gross Loans with Remaining Maturity > 1 Year and > 3 Years
Weighted Interest Rate on Gross Loans with Remaining Maturity > 3 Years and > 5 Years
Weighted Interest Rate on Gross Loans with Remaining Maturity > 5 Years
Weighted Interest Rate on Gross Loans with Original Maturity < 1 Year
Weighted Interest Rate on Gross Loans with Original Maturity > 1 Year and > 3 Years
Weighted Interest Rate on Gross Loans with Original Maturity > 3 Years and > 5 Years
Weighted Interest Rate on Gross Loans with Original Maturity > 5 Years

Ratios
Return on Assets (End of Period)
Return of Equity (End of Period)

Bank Information
Bank Identifier (Can Be Anonymized)
Bank Type (Commercial, Development, Mortgage, Cooperative, or Other)
Bank Nationality (Foreign or Domestic)

9. Annex 2. Details on Sources of Information for Countries Not Responding to the ASBA-World Bank Survey

A. Costa Rica

The data from Costa Rica were sourced from the website of the banking supervisor.[27] The data for the distribution of bank loans by purpose and the maturity profile of bank loans are organized by banks, and the information for the system is not readily available.[28] As a result, for Costa Rica, the data are constructed using data from the top four banks.[29] These four banks constitute an average of 60 percent of the banking system between 2005 and 2014. For the data by purpose, the commercial loans include agriculture, fisheries, manufacturing, mining, trade, utilities, hotels and restaurants, transportation, real estate, education, services, and other loans to the private non-financial sector. Consumer loans are the category consumer (category S) and mortgage loans are category F, which includes the construction, buying, and reparation of buildings.

For the maturity data, the classification of the maturity of loans is available in the individual bank's financial reports. These are PDF files, and the term structure of assets and liabilities is listed in the notes section of the reports. The term structure of loans is shown by the remaining maturity and for each bank. The following categories are available: (a) less than 30 days, (b) between 31 and 60 days, (c) between 61 and 90 days, (d) between 91 and 180 days, (e) between 181 and 365 days, and (f) more than 365 days. As a result, the maturity data for Costa Rica are divided in maturity 'pairs' of less than one year and more than one year.

B. Dominican Republic

Data for the Dominican Republic were sourced from the website of the superintendent of banks.[30] For the distribution of loans by purpose, data are available annually from 2006 across 20 sectors. Total gross commercial loans were calculated by adding the total gross loans in the following categories: agriculture, fisheries, mining, manufacturing, utilities, construction

[27] *Superintendencia General de Entidades Financieras*. https://www.sugef.fi.cr.
[28] See https://www.sugef.fi.cr/servicios/reportes/Actividad_Atraso.aspx for the data interface.
[29] These are Banco de Costa Rica (BCR), Banco Nacional de Costa Rica (BNCR), Banco Popular y de Desarrollo Comunal (BPDC), and Banco BAC (Banco de América Central) San Jose.
[30] *Superintendencia de Bancos de la República Dominicana*: http://sb.gob.do/transparencia-estad%C3%ADsticas-institucionales/estad%C3%ADsticas-financieras-auditadas-anuales.

(excluding mortgages), commerce, hotels and restaurants, transport, real estate, education, health, and other services. Total gross consumer loans were calculated using the line item for consumer loans for goods and services, while total gross mortgage loans were calculated using the line item for the buying or renovation of housing.

For the maturity of total gross loans and the data from the banks in the Dominican Republic, the information is in the notes to the financial statements as in the case for Costa Rica. For each of the banks' notes to their financial statements, there is a section on liquidity risk that contains the remaining maturity of total gross loans categorized as between 1 and 30 days, between 31 and 90 days, between 90 days and one year, between one year and five years, and more than five years. Data for the top three banks were compiled from 2008 to 2014, and these banks represent an average of 64 percent over 2008 to 2015 of the system's total gross loans.[31] Given that there are data for loans of remaining maturity one to five years and above five years, the maturity data for the Dominica Republic are in the form of maturity 'triples'.

C. ECCU

The ECCU is a currency union of eight economies. These are Anguilla, Antigua and Barbuda, Dominica, Grenada, Montserrat, St. Lucia, St. Kitts and Nevis, and St. Vincent and the Grenadines. The loan purpose and maturity data for loans from the ECCU are obtained from the Eastern Caribbean Central Bank (ECCB).[32] The data are available on a monthly basis from 2000 onward. December values from 2004 onward are used to construct the series. Total gross commercial loans are constructed by summing the following categories: agriculture, construction, trade, entertainment and catering, fisheries, manufacturing, mining and quarrying, tourism, transportation, and utilities. Consumer loans are constructed by adding personal loans for durable consumer goods and other personal loans. Mortgage loans are constructed by adding the following: personal loans for home construction and renovation and personal loans for house and land purchases.

The ECCB also reports the maturity of total loans and advances. No maturity information is available for overdrafts; however, overdrafts are only 9 percent of total loans, advances, and

[31] These banks are Banco Reserva, Banco Popular, and Banco BHD.
[32] ECCB Statistics https://www.eccb-centralbank.org/statistics/commercial-banks-assets-datas/comparative-report Tables 1.13A and 1.13B [accessed February 2017].

overdrafts combined. The maturity information is available across three categories: less than one year, between one to five years, and above five years. Therefore, the maturity information for the ECCB is in the form of 'triples'. As with the loans by purpose, this is available from 2000 onward.

D. Jamaica

The data from Jamaica come from the Central Bank of Jamaica.[33] The sectoral distribution of commercial banks' loans is available monthly from 1986. The December values from 2000 to 2014 are used to construct the annual time series. Commercial loans include loans to the following sectors: agriculture, mining, manufacturing, construction, transportation, utilities, distribution, tourism, entertainment, and other services. The consumer loan series for Jamaica is built by subtracting mortgage loans from personal loans. The mortgage loan series is sourced from the annual reports of the Central Bank of Jamaica.

E. Mexico

Data for Mexico were sourced from the banking and securities superintendent of banks.[34] For the loans by purpose distribution of total gross loans, data are available monthly from 2011 and quarterly from 1998 in the statistical bulletins. December or fourth quarter values are used to construct an annual series. Commercial loans are constructed by using the commercial loans to firms and by excluding commercial loans to financial companies and to public entities. For the consumer loan series, the data are constructed by using the consumer series, and for mortgages, the loans for housing are used. This produces the sector series from 2004 to 2014. The maturity data for Mexico are available from 2009 onward. Mexico reports loans with maturity less than and more than one year; so, Mexico reports in 'pairs'.

F. Paraguay

The data from Paraguay come from the banking supervisory, which is part of the central bank.[35] The monthly statistical bulletins from 2010 to 2015 contain data on the distribution of loans by purpose. The end-of-December values are taken for the end-of-the-year values. Mortgage data only start in 2010; therefore, available sector data from 2008 and 2009 were not included in

[33] Central Bank of Jamaica Statistics Portal. http://www.boj.org.jm/statistics/econdata/stats_list.php?type=3.
[34] *Comisión Nacional Bancaria y de Valores*. http://www.cnbv.gob.mx/Paginas/PortafolioDeInformacion.aspx.
[35] *Superintendencia de Bancos*. https://www.bcp.gov.py/supervision-financiera-i59.

the database. Commercial loans include loans to agriculture, animal husbandry, industry, trade, and services. Consumer loans are categorized as such, and mortgage loans are taken from the line item for housing. There are no data for the maturity of total gross loans, and so, Paraguay only has data for the sectors of total gross loans.

G. Trinidad and Tobago

The loan information for Trinidad and Tobago is available from the Central Bank of Trinidad and Tobago.[36] The distribution of loans by purpose is reported for commercial banks. Commercial loans include loans to the following sectors: manufacturing; miscellaneous manufacturing; distribution; hotels and guest houses; services - personal service; agriculture; food, drink, and tobacco; printing and publishing; wood and related products; chemicals and nonmetallic minerals; assembly-type and related industries; and electricity and water loans. Consumer loans include the following: bridging finance, land and real estate, home improvement/renovation, motor vehicle, insurance and repairs to motor vehicles, domestic appliances and furnishings, purchase of other financial assets, education, medical, travel, insurance (life and non-life) and professional services (legal, funeral, and so on), refinancing, consolidation of debt, miscellaneous and personal services, and other purpose. Mortgage loans include real estate mortgage. This loan purpose distribution is available from 2000 onward. There is no maturity information of bank loans for Trinidad and Tobago.

[36] Central Bank of Trinidad and Tobago banking sector aggregates. https://www.central-bank.org.tt/statistics/selected-aggregates.

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