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The Credit Structure Database

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Florian Leon, CREA, University of Luxembourg

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For editorial correspondence, please contact: crea@uni.lu
University of Luxembourg
Faculty of Law, Economics and Finance
162A, avenue de la Faïencerie
L-1511 Luxembourg

The Credit Structure Database

Florian Léon[1]

University of Luxembourg, CREA

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Abstract

We describe a new publicly available dataset on credit structure across the world over the period 1995-2014. The database contains two modules.

The first part reports the structure of bank loan by types of borrowers (households vs. firms). Data are available for 143 countries. Household credit is breakdown between mortgage loans and other household loans (credit cards, car loans, student loans, etc.). Firm credit is decomposed into six sectors (agriculture, industry, construction, transport, trade and other services).

The second module contains credit by maturity for 85 countries. Short-term credit is defined as loans with a maturity of one year or less and long-term credit as loans whose maturity exceeds one year.

Database is freely available and downlable in Excel and Stata format at the following link: https://sites.google.com/site/florianleon/research/data

Keywords : Financial development; household credit; firm credit; long-term credit; short-term credit

JEL Classification : G21; O16

[1] Mail: florian.leon@uni.lu
162a, Avenue de la Faiencerie L-1511 Luxembourg, Luxembourg
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1. Introduction

A large literature has established the importance of financial development for economic growth and development (Levine, 2005). Empirical literature often employs the ratio of credit to the private sector to GDP to measure the size of banking development. However, this measure is a crude proxy insofar as it mixes both firm credit and household credit, and short-term loans and long-term loans. This issue is not only technical but also economically important. Indeed, recent studies have shown that the structure of credit matters to explain the impact of finance (Beck et al., 2012; Mian et al., 2016; Léon, 2016, Léon, 2018b).

We present a new database, Credit Structure Database, which combined two datasets employed in separate research papers (Léon, 2016; 2018a; 2018b). The structure of credit is defined by two questions: (i) who gets the credit?; (ii) at which conditions? Our database presents two modules that concentrate on each point.

The first module focuses on who gets the credit and it distinguishes credit according to the type of borrowers (Léon, 2016; 2018a). Our database is not the first to compile credit to households and credit to firms. However, existing data based on researchers' initiatives (e.g., Beck et al.; 2012 or Mian et al., 2016) or on institutions' database (e.g., BIS database) focus on a limited number of countries and often neglect developing countries and/or time dimension.[2] Our dataset considers 143 countries spanning different periods, depending on data availability, from 1995 to 2014. Considering a large range of countries allows us to include economies from all levels of development and from all continents. Twenty countries were classified as low-income countries in 2015, 67 as middle-income countries and 56 as high-income countries. The sample includes 42 countries from Europe, 29 from Latin America and the Caribbean, 2 from North America, 4 from Central Asia, 20 from East Asia and the Pacific, 6 from South Asia, 30 from Sub-Saharan Africa and 12 from the Middle-East and North Africa.

For the second question, there are different ways to capture credit conditions (maturity, collateral requirements, currency, etc.). We focus on maturity for two main reasons. First, data on other aspects are rarely available and, if so, cannot be easily harmonized across countries and/or over time. Second, there is strong arguments to believe that loan maturity matters to explain economic performance (see, Léon

[2] Beck et al. (2012) consider 45 countries in one period over time, Mian et al. (2016) have historical data for 30 industrialized economies, and the BIS Long Series database covers 43 emerging and developing countries.

2018b). To our knowledge, there is no data freely downloadable on bank loan maturity. Valev and Tasic (2008) have built a similar database but data are not available.

To construct the database, we firstly hand-collected data from diverse sources including Central Bank publications including Central Bank annual reports, supervision department/agency annual reports, annual bulletins and statistical digests. We secondly harmonized data to provide coherent categories. We finally calculated the ratio of each item relative to GDP by dividing data in current local currency by the GDP in current local currency (provided by the World Bank Indicators). The last version of this database has been updated in 2016.

The paper is structured as follows: Section 2 describes the construction of the Credit Structure Database. Section 3 describes the structure and content of the Excel and Stata data files. Section 4 presents some tests to gauge the relevance of information reported in the CSD. The final section concludes.

2. Construction of the Credit Structure Database

2.1. First module: Credit by types of borrowers

The first module reports credit to firms and credit to households for 143 countries over the period 1995-2014 (see Appendix for the list of country). This database has been previously employed by Léon (2016, 2018a).

Initial data have been extracted from diverse sources (Central Bank annual reports, supervision department/agency annual reports, annual bulletins and statistical digests) country-by-country and year-by-year. Some basic filters were applied to allow comparison across countries. From the supply-side, we focused on credit provided by commercial banks. In other words, we did not consider credit provided by non-banking financial institutions as data on loans provided by non-banking financial intermediaries are not always available. In some countries, total credit provided by the non-banking financial sector can be very different from credit provided by the banking system (e.g., in the US). However, in the majority of countries, loans are mainly provided by commercial banks. On the demand-side, we excluded credit allocated to central and local administration because we focus here on private credit. Nonetheless, to avoid (spurious) breaks due to privatization of former state-owned companies in recent years, we considered credit to state-owned enterprises as part of business (private) credit. In addition, we excluded credit to financial companies. After applying these filters, we considered all countries for which we were able to identify a consistent data source.

Household credit was defined as credit to households, credit to individuals or personal credit. Obtaining reliable information on household credit is difficult, especially in less developed countries. We reported credit to household when explicit data were reported, therefore improving reliability of data. Firm credit was defined as credit allocated to non-financial corporations.[3] The distinction between household and firm credit can be misleading for sole proprietorship. For the majority of countries, we had no information on individual enterprises. However, when we were able to obtain sufficient disaggregated data, loans to individual companies were considered as an element of firm credit.

We then broke down household credit into home loans (mainly mortgage loans) and other loans (consumer credit, student loans, credit cards, auto loans, etc). We consider this breakdown only when explicit information is available. This breakdown is available for 84 countries.

For firm credit breakdown, we face a trade-off between considering many sectors but few countries or considering few sectors but many countries. Insofar as our aim is to have a large coverage of countries, we focus on large sectors. We finally consider six sectors: agriculture and fishing, industry (mining, gas and water, manufacturing), construction, transport, trade and other services (e.g., hotels and catering, IT business services). This decomposition is available for 104 countries.

2.2. Second module: Credit by maturity

The second module reports credit by maturity (short-term credit and long-term credit) and has previously circulated under the name "Bank Loan Maturity Database" (Léon, 2018b).

Data were hand-collected from diverse sources including central bank annual reports, supervisory department/agency annual reports, annual bulletins and statistical digests. Although alternative sources of long-term finance (such as leasing, venture capital and crowdfunding) are available for entrepreneurs, only credit provided by commercial banks was considered, for two main reasons. First, data on other sources of long-term financing are rarely available and, if so, are not comparable across countries. Second, even if markets and institutional investors provide a large share of long-term finance, entrepreneurs rely mainly on informal finance or bank credit to finance their business projects. The use of non-banking sources for long-term financing is rather the exception than the rule, especially in developing countries.

[3] It should be noted that we were able to collect data on firm credit for 18 additional countries (Bangladesh, Bolivia, Brazil, Burundi, the Democratic Republic of Congo, Ghana, Iran, Jordan, Laos, Liberia, Nigeria, Rwanda, Samoa, Sudan, Suriname, Tanzania, Taiwan and Yemen) for which we do not have data on household credit.

We break credit down into two categories. Short-term credit is defined as loans with a maturity of one year or less and long-term credit as loans whose maturity exceeds one year. Ideally, we wanted to employ a flexible definition of short-term and long-term credit by considering different maturity thresholds (six months, one year, two years, etc.). Unfortunately, in the majority of cases, raw data provided in annual reports or statistical digests just broke out bank credit between short-term credit (less than one year) and long-term credit (over one year). Therefore, to facilitate comparison and increase the number of countries considered we followed this break down.

The database on bank loan maturity includes data on all countries (both developed and developing) for which we were able to identify a consistent data source. The initial database considers 85 countries over the period 1995-2014 (unbalanced data). The list of countries, provided in Appendix A, comprises 14 low-income countries, 34 middle-income countries and 37 high-income countries. The coverage over time of the database is relatively good (there are only 12 countries for which we have less than 10 years of data).

2.3. From raw data to CSD

Each item (household credit, firm credit, credit to industry, etc.) was initially reported in the current local currency amount of each country. We transform the data by dividing these figures by current GDP in local currency from World Development Indicators[4] for each country-year. As a result, we get the ratio of credit over GDP for each category (borrowers and maturity). As a result, our database is comparable with the ratio of credit to private sector reported in the Global Financial Development Database (Cihak et al., 2013).[5]

3. The CSD in Excel and Stata

The Credit Structure Database is available at: https://sites.google.com/site/florianleon/research/data.

Variable names, similar in both Stata and Excel files are defined as follows and presented in Table 1:

- Prefix = module (borr for the first module and matur for the second)
- Suffix: variable (total=total credit; household=household credit; short=short-term credit, etc.)

[4] Available at: https://data.worldbank.org/data-catalog/world-development-indicators (code: NY.GDP.MKTP.CN).
[5] Available at: https://data.worldbank.org/data-catalog/global-financial-development

Table 1: Variable definition

Variable name	Description
Country information	
code	Country code (iso3)
country	Country name
year	Year
region	Region (World bank classification)
income	Income group (World bank classification)
First module: Credit by type of borrowers	
borr_total	Total credit over GDP (sum of household credit and firm credit)
borr_household	Household credit over GDP
borr_firm	Firm credit over GDP
borr_home	Household credit for home purpose over GDP
borr_nonhome	Household credit for non-home purpose over GDP
borr_agri	Firm credit for agriculture and fishing over GDP
borr_industry	Firm credit for industry (mining and gas, manufacturing, energy) over GDP
borr_construction	Firm credit for construction over GDP
borr_transport	Firm credit for transport and communication over GDP
borr_trade	Firm credit for trade (retail and wholesale) over GDP
borr_misc	Firm credit for unclassified sector over GDP
Second module: Credit by maturity	
matur_total	Total credit over GDP (sum of short-term and long-term credit)
matur_short	Short term credit (< or = of 1 year) over GDP
matur_medlong	Long-term credit (> 1 year) over GDP

To facilitate replications exercises, we also add total credit over GDP reported in the Global Financial Development Database (variable: gfdd_total)[6] as well as data on credit to the non-financial sector provided by the Bank for International Settlements (variables: bis_total, bis_household, bis_firm).[7]

The Excel file has four sheets. The first sheet (Data) displays data and the second sheet (Variables) the Table reported above. The two last sheets (Meta – borrowers; Meta - Maturity) are dedicated to metadata. In both, we display for each country

- Country information (level of income, region)
- The last update (in general 2016)
- Period of availability (e.g., 2004-2014)
- Source (Which table is used in which report)
- Internet link to find source (during the last update, some links could be broken)
- Remarks on decisions made to harmonize data

For the sheet on metadata for borrowers, we add a column for lacking categories. For the sheet on metadata for maturity, we add a column (Loan) that reports if all loans or only loans to private non-financial sector are used.

4. Reliability of the database

We present some evidence that our new database provide reliable data. In doing so, we compare our database with existing data.[8]

2.1. Total credit

We first compare the level of total credit computed by our two modules (variables: borr_total and matur_total) with data on domestic credit to private sector provided in the Global Financial Development Database (Cihak et al., 2013; variable: gfdd.di.14). As expected, correlation coefficients are close to one as shown in Table 2.

[6] Available at: http://www.worldbank.org/en/publication/gfdr/data/global-financial-development-database
[7] Available at: https://www.bis.org/statistics/totcredit.htm
[8] We do not present basic descriptive statistics. This information could be found in Léon (2018a) for the type of borrowers (1st module) and in Léon (2018b) for credit maturity (2nd module).

Table 2: Coefficient correlations between different measures of total credit

	borr_total	matur_total	gfdd_total
borr_total	1		
matur_total	0.9581	1	
gfdd_total	0.9003	0.8548	1

It should be noted that differences increase with the level of financial development and total credit from GFDD often exceeds total credit from the CSD. Concisely, our measure of total credit from both modules are highly similar to those obtained in the frequently used Global Financial Development Database.

2.2. Household and firm credit

Comparison with BIS Long Series

To test whether our database is reliable we present correlations between household credit (respectively firm credit) from the CSD and the BIS Long Series Dataset. The BIS Long series dataset on total credit to the non-financial private sector presents household credit and firm credit for 44 countries over a long period (since 1952 for the U.S. and in many cases since the 1980s). One advantage of this dataset is the effort made to ensure comparison through harmonization protocols among national statistics authorities. We compare measure of household credit (respectively firm credit) from both datasets. We expect that data from BIS exceed those from CSD insofar as BIS dataset consider not only loans from banks but also other sources of financing. Coefficient associated to correlation between two measures of household credit is relatively high (0.78). Figure 1 points out that data from BIS exceeds those from the CSD (the red line reports the 45° degree line).

Difference between both measures of firm credit are larger. Correlation coefficient only equals 0.40. We show from Figure 2 that BIS data exceed largely those obtained from CSD. This may explained by the weight of non-banking loans in firm credit.

Figure 1: Comparison of household credit from BIS data and CSD data

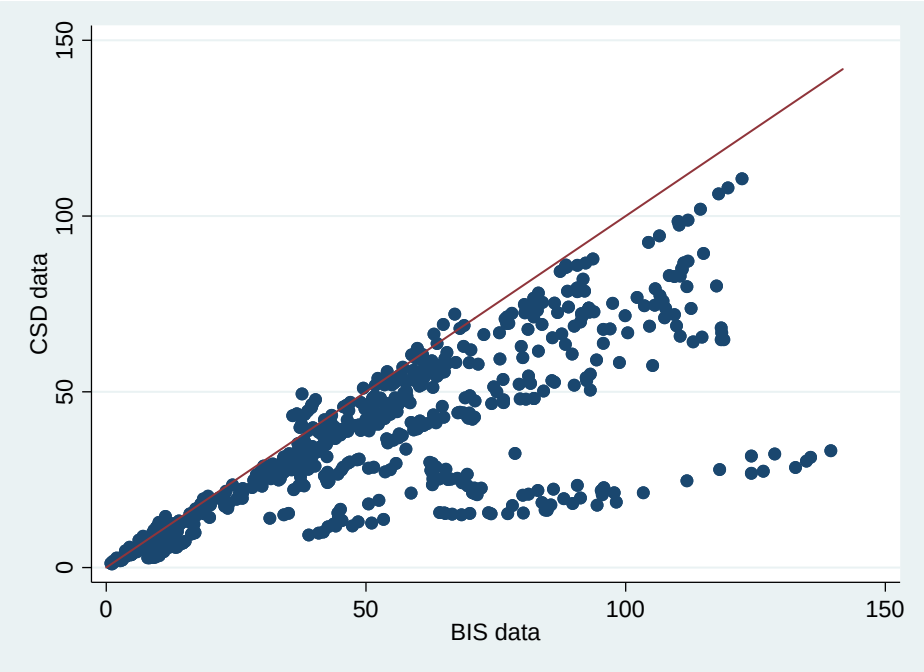
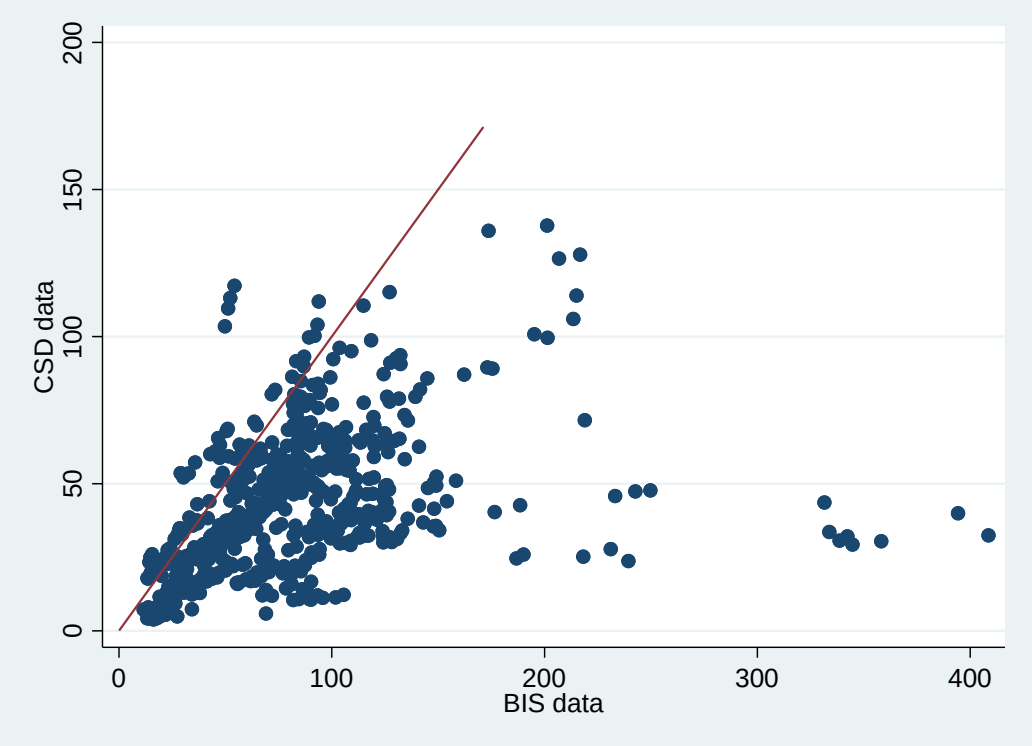


Figure 2: Comparison of firm credit from BIS data and CSD data



Comparison with surveys (Findex and Enterprise Surveys)

To study relevance of our dataset for other countries, we combine our dataset with two surveys (Findex and Enterprise Surveys) that report use of financial services by households and firms (Levine et al., 2017).

We first compare the level of household credit with the percentage of individuals who report borrowing any money from a bank, credit union, microfinance institution, or another financial institution such as a cooperative in the past 12 months (variable extracted from GFDD (code: gfddai07) produced using data from Findex). Both measures capture different realities. The Findex measure captures more extensive margin, while our measure from CSD is a mix of extensive margin (number of borrowers) and intensive margin (level of amount per borrower). Nonetheless, the correlation between the percentage of individuals that borrow and the ratio of household credit at the country level (120 countries) equals 0.49 that seems reasonable.

We do the same exercise for firm credit. We compare our measure from CSD with the percentage of firms with a bank loan or a line of credit (variable extracted from GFDD (code: gfddai03) produced using data from Enterprise Surveys). Correlation equals 0.43 that is not so bad insofar as both measures captures different things, as previously. It should be noted that firm credit is also correlated with the percentage of firms using banks to finance investments (ρ=0.51).

2.3. Short-term credit and long-term credit

Due to the lack of data, we cannot compare data from CSD with other databases. Nonetheless, the Enterprise Surveys provide two indicators that are theoretically related to the ratio of long-term credit: (i) the proportion of a firm's long-term investment that is financed by borrowing from banks (code: gfddai34 in the GFDD); and, (ii) the percentage of firms using banks to finance investments (code: gfddai28 in the GFDD). In Table 3, we present correlations between these two proxies and measures of short-term credit over GDP and long-term credit over GDP. As expected, both proxies of firms' use of long-term loans are more correlated with the ratio of long-term credit than with short-term credit.

Correlations between credit by maturity and proxies from GFDD

	Credit over GDP	
	Short	Long
% of a firm's long-term investment that is financed by borrowing from banks	0.31	0.62
the percentage of firms using banks to finance investments	0.27	0.60

Unfortunately, we cannot compare the ratio of short-term and long-term credit over GDP with households' use of short-term and long-term loans.

5. Conclusion

This paper presents a new database, freely available, on credit structure across countries (Credit Structure Database). The CSD reports two main information:

- Credit by type of borrowers (first module)
- Credit by maturity (second module)

Data on the first module are available for 143 countries and data for the second module for 85 countries over the period 1995-2014.

We compare data from CSD with data from other sources on similar items (BIS Long Series Dataset) or related items (Findex and Enterprise surveys). This comparison gives us some confidence in the relevance of our data.

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Appendix A: List of countries

Credit by type of borrowers (143 countries)

Albania; Antigua and Barbuda; Argentina; Armenia; Aruba; Australia; Austria; Azerbaijan; Bahamas; Bahrain; Barbados; Belarus; Belgium; Belize; Benin; Bhutan; Bosnia Herzegovina; Botswana; Brunei; Bulgaria; Burkina Faso; Cambodia; Cameroon; Canada; Central African Rep.; Chad; Chile; Colombia; Comores, Congo, Rep., Côte d'Ivoire; Croatia; Czech Rep.; Denmark; Djibouti; Dominica; Dominican Rep.; Egypt; El Salvador; Equatorial Guinea; Estonia; Ethiopia; Fiji; Finland; France; Gabon; Gambia; Georgia; Germany; Greece; Grenada; Guatemala; Guinea; Guinea-Bissau; Guyana; Haiti; Honduras; Hong-Kong; Hungary; Iceland; India; Indonesia; Ireland; Israel; Italy; Jamaica; Japan; Kazakhstan; Kenya; Korea; Kosovo; Kuwait; Kyrgystan; Latvia; Lebanon; Lithuania; Luxembourg; Macao; Macedonia; Madagascar; Malawi; Malaysia; Maldives; Mali; Malta; Mauritius; Mexico; Moldova; Mongolia; Montenegro; Morocco; Mozambique; Namibia; Nepal; Netherlands; New Zealand; Nicaragua; Niger; Oman; Pakistan; Panama; Peru; Philippines; Poland; Portugal; Puerto Rico; Romania; Russia; Saudi Arabia; Senegal; Serbia; Singapore; Slovakia; Slovenia; Solomon Isl.; South Africa; Spain; Sri Lanka; St. Kitts; St. Lucia; St Vincent; Swaziland; Sweden; Switzerland; Tajikistan; Thailand; Timor-Leste; Togo; Tonga; Trinidad and Tobago; Tunisia; Turkey; Uganda; Ukraine; United Arab Emirates; United Kingdom; USA; Uruguay; Vanuatu; Zambia; Zimbabwe

Credit maturity (85 countries)

Albania; Algeria; Antigua and Barbuda; Austria; Azerbaijan; Bahamas; Barbados; Belarus; Belgium; Benin ; Bosnia and Herzegovina; Botswana; Bulgaria; Burkina-Faso; Burundi; Cameroon; Central African Rep; Chad; Chile; Comoros; Congo; Côte d'Ivoire; Croatia; Czech Rep; Dem. Rep. of Congo; Denmark; Djibouti; Dominica; Equatorial Guinea; Estonia; Finland; France; Gabon; Georgia; Germany; Greece; Grenada; Guatemala; Guinea; Guinea Bissau; Hungary; Ireland; Italy; Jordan; Kazakhstan; Kosovo; Kyrgyz Rep; Latvia; Lithuania; Luxembourg; Macao; Macedonia; Madagascar; Malaysia; Mali; Malta; Mauritania; Mongolia; Morocco; Netherlands; New Zealand; Niger; Nigeria; Oman; Poland; Portugal; Romania; Russia; Rwanda; Saudi Arabia; Senegal; Serbia; Singapore; Slovak Rep.; Slovenia; St. Kitts and Nevis; St. Lucia; St Vincent; Sweden; Taiwan; Togo; Tunisia; Ukraine; Uruguay; Yemen