

# Measuring Financial Access around the World

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March 2010



## Abstract

This paper introduces a new set of financial access indicators for 139 countries across the globe and describes the results of a preliminary analysis of this data set. The new data set builds on previous work using a similar methodology. The new data set features broader country coverage and greater disaggregation by type of financial product and by type of institution supplying the product—commercial banks, specialized state run savings and development banks, banks with mutual ownership structure (such as cooperatives), and microfinance institutions. The authors use the data set to conduct a

rough estimation of the number of bank accounts in the world (6.2 billion) as well as the number of banked and unbanked individuals. In developed countries, they estimate 3.2 accounts per adult and 81 percent of adults banked. By contrast, in developing countries, they estimate only 0.9 accounts per adult and 28 percent banked. In regression analysis, they find that measures of development and physical infrastructure are positively associated with the indicators of deposit account, loan, and branch penetration.

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This paper—a product of the Financial Access Team in Consultative Group to Assist the Poor, Financial and Private Sector Development—is part of a larger effort in the department to improve measurement of access to financial services. Policy Research Working Papers are also posted on the Web at <http://econ.worldbank.org>. The author may be contacted at [nmylenko@worldbank.org](mailto:nmylenko@worldbank.org).

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\* The World Bank / CGAP; we are grateful to Amrote Abdella, Maximilien Heimann, Yehia Houry, Joana Pascual and Valentina Saltane for research assistance. This paper's findings, interpretations, and conclusions are entirely those of the authors and do not necessarily represent the views of CGAP, CGAP's Council of Governors or Executive Committee, the World Bank, its Board of Executive Directors, or the countries they represent. Data available at: <http://www.cgap.org/financialindicators>

## 1. Introduction

Financial inclusion—providing access to financial services for the poor—has gained increasing prominence in the past few years as a policy objective for national level policy makers, multilateral institutions, and others in the development field. The United Nations designated 2005 the International Year of Microcredit, adopting the goal of building inclusive financial systems, and most other development institutions and multilateral donors have financial access on their agenda. Consequently, both private and public funds are flowing to fund various financial inclusion initiatives around the world.<sup>1</sup>

The rise of financial inclusion as an important policy goal is due in part to mounting evidence that access to financial products can make a positive difference in the lives of the poor. From the field, the evidence comes in the form of rapid take-up of financial services when they are made available to poor households and the very high rates of repayment that the poor exhibit in order to maintain access. The results of the Financial Diaries Project; summarized in the recent book “Portfolios of the Poor”, by Collins, Morduch, Rutherford, and Ruthven (2009); show how dependent the poor are on various financial instruments, both informal and formal, to manage what little money they have on a day to day basis. And – though the results do not always support preconceived notions prevalent in the microfinance community – an increasing number of academic studies show that granting the poor access to financial services can make a difference in their lives in various ways [see, e.g. Burgess and Pande (2005), Karlan and Zinman (2005, 2009), Dupas and Robinson (2008), Banerjee, Duflos, Glennerster, and Kinnan (2009), Bruhn and Love (2009)].<sup>2</sup> In short, as a policy goal, developing more inclusive financial systems will continue to hold a place on the policy agenda.

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<sup>1</sup> For example, in 2008, there was over \$11Bn in outstanding investments in MFIs, nearly 50% of which were private funds.

<sup>2</sup> For example, three recent randomized control trial studies do not support the vision of microfinance’s main goal being to lend to those poor wanting to start or expand a business. Instead, they find that access to consumer credit can also improve welfare by (e.g.) keeping people in their jobs (Karlan and Zinman (2005)), that access to microenterprise oriented credit is fungible with other forms of household debt and is often used to improve risk management rather than to invest in a business (Karlan and Zinman (2009)), and that the presence of a new MFI in a neighborhood has no impact on consumption or health and education spending of micro-entrepreneur households 15-18 months later, though it does seem to improve households ability to borrow, invest, and create and expand businesses.

A necessary step towards achieving an inclusive financial system is to evaluate its status in each country. To assist policymakers in designing effective policies and tracking progress in the area of financial inclusion at global level, this paper introduces a new set of financial access indicators for 139 countries across the globe, and describes the results of a preliminary analysis of this data set.

This data collection effort has its roots in two previous projects carried out at the World Bank. The first set of similar indicators of financial access was collected in 2003 for 99 countries (see Beck, Demirgüç-Kunt, and Martinez-Peria (2007)). In this initial effort, data were collected on number of loans, deposit accounts, bank branches, and ATMs associated with deposit money banks (as defined by the IMF). These indicators were updated for a select set of 54 countries in 2007 with the “Banking the Poor” report (World Bank (2008)) and augmented with a set of survey questions regarding various regulatory features and policy initiatives present in the country as well as a survey of the 5 largest banks in the country by total assets which collected data on banks’ fees and the procedures clients had to go through to access loans or deposit accounts.

The current set of indicators builds on these two previous works using a similar methodology to collect new data through a survey of financial regulators in 139 countries. In addition to being more recent and having broader country coverage, this new database features finer disaggregation by type of financial product and by categories of the financial institutions supplying such products – commercial banks, specialized state run savings and development banks, banks with mutual ownership structure (e.g. cooperatives), and microfinance institutions.

Next, we use this data set to conduct a scoping exercise to estimate the number and distribution of bank accounts worldwide as well as the number of banked and un-banked individuals. Our estimates suggest that there are approximately 6.2 billion deposit accounts in the world, more than one for each adult on the planet. However, these accounts are not evenly distributed. We estimate that around 160 million adults in developed countries have no bank account (or 19% of all adults) whereas somewhere near 2.7 billion adults (or 72%) of the adults in developing

countries are un-banked. While these figures are back-of-the envelope calculations, they give a sense of the scale of the problem of delivering financial services to the poor.<sup>3</sup>

Finally, we conduct a preliminary analysis of the data and focus on the national level factors associated with greater deposit account and loan penetration (measured as number of accounts or loans per 1000 adults) and of bank branch density (both relative to population and geographic area). We conduct basic cross-country regressions, controlling for income and population density, two of the best predictors of the penetration of deposit and loan products in the population and of the density of bank branching.<sup>4</sup> Consistent with previous literature, we find that controlling for these two factors, the best predictor of deposit account and loan penetration as well as branch penetration are measures of the development of physical infrastructure including electricity consumption and phone line density. Additionally, lower inflation and the presence of explicit deposit insurance are associated with greater deposit penetration. On the lending side, higher concentration in the banking sector is significantly associated with lower loan penetration, while measures of creditor rights and creditor information availability are positively associated with penetration. Finally, none of the policies our survey respondents reported employing to boost financial inclusion (such as mandates for basic “no-frills” bank accounts, or allowing for agent-based banking) show any significant relationship with our measures of loan and deposit penetration. This result however, does not imply that these policies are ineffective, but rather an indicator of the large variations the countries pursuing them.<sup>5</sup> Further analysis, including micro-level studies, is essential to evaluate the effectiveness of measures aiming to improve access to financial services.

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<sup>3</sup> Additionally, these figures do not necessarily equate to percentage of *households* with bank accounts.

<sup>4</sup> Our hypothesis is that population density is a proxy for the profitability of bank branching both because more customers can be reached per branch in dense areas, and because infrastructure and other services are often more available in dense areas. When both bank branch density and population are included, branch density is highly significant, and the coefficient on population density becomes negative. We use population density because branch data are not available everywhere in all countries.

<sup>5</sup> Cross-country regressions are not appropriate for measuring the impact of specific policies, as they rarely capture changes in the variables over time. For example, the coefficients of a cross-country regression of a certain policy on the number of accounts are likely to be identified by the differences between countries with a large number of accounts and no policies in place (perhaps because those countries do not need them) and countries with few accounts but recent policies addressing this issue.

The paper is structured as follows: Section 2 describes the collection of the data and the survey design, Section 3 gives some facts describing the patterns of bank and non-bank supervision around the world, and the related patterns of data availability for different elements from the survey, Section 4 describes the procedure for estimating the number of accounts world wide and the number of banked and unbanked individuals, Section 5 contains the results of the regressions with the correlates of deposit, loan, and bank branch penetration. Section 6 concludes.

## **2. Description of Data Collection Methodology**

The primary purpose of the Financial Access Survey was to assemble a dataset of measures of the breadth of usage of the most basic financial products including deposit accounts, loans, and payments. A secondary goal was to measure the pervasiveness of physical access points such as bank branches and ATMs which are necessary elements to facilitate broad inclusion. Finally, the survey attempts to collect information on some of the policies and practices in each country which might affect financial inclusion.

It is important to distinguish between usage of financial services, which is what we can collect data on, and the broader concept of access to finance. A widely cited definition of financial access is that outlined by Claessens (2006) who breaks the population into three parts, those who have access and use it (group A, included), those who have access but don't use it (group B, voluntarily excluded), and those who don't have access (group C, involuntarily excluded) where "access" is defined equal  $A + B$ . He contends that while data on the usage of financial products measures A, B is almost impossible to measure, which highlights the difficulty in finding true measures of "access to finance", so defined. While in concept, not being able to measure the voluntarily excluded is a major issue, in reality, there are very few households anywhere which live in true voluntary financial autarky (though they may choose only informal financial options if formal ones are not readily available).<sup>6</sup> The real issue is that usage data is only widely

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<sup>6</sup> In *Portfolios of the Poor*, by Collins, Morduch, Rutherford, and Ruthven (2009), the authors show that *all* 250 of the very poor slum residents they study have some form of debt and savings and none use fewer than 4 types of instruments (be they formal or informal) throughout the year. The true picture is one where poor households are

available in terms of the volume or number of loans or deposit accounts, but not in terms of the number of individuals who own them and thus does not give a clear picture of what percentage of households use formal financial services.<sup>7</sup> The Financial Access Survey focuses on measuring the usage of a set of basic financial products from various types of formal intermediaries. We confirm in Section 3 that the measures we collect correlate strongly with the few available data points from household surveys that measure the number of individuals using similar products.

To achieve the goal of measuring usage of financial services in the world, access to finance questionnaires were sent to 144 countries around the world: 13 countries in East Asia and Pacific, 27 countries in Europe and Central Asia, 23 countries in high income OECD region, 21 countries in Latin America and Caribbean, 14 countries in Middle East and North Africa, 6 countries in South Asia and 40 countries in Sub-Saharan Africa. For practical reasons, most of the small islands and countries at war were excluded from the sample. The survey was directed to the central bank governor's office or head office of the financial regulator for approval and assignment to a contact person, often in the statistics department, who would be responsible for gathering the appropriate information. A response was received from 139 countries representing 90% of the world's population and 97% of world GDP. For more detail on the coverage of individual data elements, see Section 4.

## ***2.1 Description of Survey***

Data collection was implemented through a regulators' questionnaire. The questionnaire consists of two main parts: statistical questions and regulatory questions. The statistical part of the survey collects data on the numbers and volumes of deposit accounts, loans, banking infrastructure (e.g. branches and ATMs) and other measures the usage of financial services usage. Table 1 has a list

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continuously substituting between a variety of formal, semi-formal, and informal financial products based on availability, product features, pricing, and other non-price barriers.

<sup>7</sup> This implies a certain rate of double counting since individuals can – and regularly do – own more than one deposit account for instance.



of the variables we surveyed in each of three categories. Except for ATMs, debit cards, and POS terminals, all elements were asked separately for each institutional category.<sup>8</sup>

Since many low-income individuals get deposit services through institutions which are not commercial banks (henceforth, we refer to bank-like institutions which are not commercial banks as non-bank financial institutions or non-banks for short), we ask for most of the data disaggregated into commercial banks as well as a number of non-bank categories.<sup>9</sup> This addition represents a major advantage of this study over others that have come before it. One difficulty in implementing this approach is that there are many types of financial institutions and each can be different from country to country. India, for instance, has commercial banks, Area Banks, Rural Banks, various types of Urban and Rural Cooperatives, and many other types of bank-like financial institutions, each of which differs in subtle ways from similar institutions in other countries.<sup>10</sup> To make the cross-country comparison of the different types possible and meaningful, regulated institutions are divided into four main categories and a catchall “other” category:

- 1) Commercial banks - banks with a full banking license. In some countries, majority government/state owned banks are included in this category to the extent that they perform a broad set of commercial banking functions rather than a specialized development role.
- 2) Institutions with a mutual ownership structure (or mutually owned financial institutions: *MOFIs*), such as cooperatives, credit unions or mutual banks.
- 3) Specialized state owned financial institutions (SSFIs) or extensions of the government whose main purpose is to lend to support economic development and/or to provide savings, payment, and deposit services to the public. This group includes postal banks, government savings banks, SME lending facilities, agriculture banks, development banks, etc.

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<sup>8</sup> World Bank (2008b) presents more detailed data on the status of national payment and securities settlement systems worldwide.

<sup>9</sup> In CGAP Occasional Paper No. 8, (2004) the authors refer to these non-bank financial institutions as AFIs for “Alternate Financial Institutions”.

<sup>10</sup> The survey asked respondents to list the types of retail financial institutions active in their jurisdiction. Table 1 gives a fictitious example of the variety of institutions that might be reported (the table was used as an example for respondents.)

- 4) Microfinance institutions – financial institutions whose primary business model is to lend to (and possibly take deposits from) the poor.
- 5) Other – other institutions providing deposit or retail lending services which don't fall into the above categories.

These categories were chosen in part to facilitate the disaggregation of some of the institutions which are typically more active in serving financial inclusion policy goals (such as SSFIs) or which tend to target middle class or low income clients with basic banking services (MOFIs and MFIs). The descriptions of the various categories as they were presented to the survey respondents are provided in Table 2. The regulators were asked to use their best judgment to choose only one category in which each type of institution fits. In a few cases, regulators could not separate data for two types that likely would have fallen into different categories (e.g. credit union data could not be separated from commercial bank data in Switzerland) and were asked to put them into the category which was dominant, or to leave both categories as missing and provide only the system wide total. An example of how the form was filled by a regulator is shown in Table 3.

The MFI category is somewhat problematic in that many institutions which would likely be categorized by regulators as falling into the other categories consider themselves to be MFIs. For example, deposit taking MFIs are registered as banks in many countries small rural cooperatives conduct micro-lending exclusively. Since our main focus is the use of financial services by the poor, we decided to keep the MFI category and recognize that in many countries where no data was provided, MFIs are grouped in with one of the other categories.

A second part of the survey contains questions on regulations and policies relating to access to financial services, including:

- Financial services provided through the post offices
- The use of agents and correspondents
- Bank account management

- Bank branch regulations
- Collateral and lending
- Transparency and consumer protection
- Policies promoting of access to finance.

In this part of the survey, we ask regulators to respond with answers that reflect the rules and regulations that commercial banks must follow if there is any discrepancy in how the regulations apply across institutional categories.

## ***2.2 Implementation of the Data Collection***

The questionnaires were sent directly to the head office of the main commercial bank regulator, usually the Governors' offices of Central Banks or Banking Supervisory Agencies. Depending on the country and the structure of the Central Bank, the questionnaires were filled out by one or several of the following departments: research, statistics, supervision, and/or foreign relations.

Out of 144 questionnaires sent, 129 countries responded; Eastern Caribbean Central Bank responded with seven additional unsolicited questionnaires which are included in the dataset.<sup>11</sup> Central Bank of West African States (BCEAO), which accounts for eight countries, did not provide a response. Also, Egypt, Saudi Arabia, United Arab Emirates, Sudan, Liberia, Nigeria and Sierra Leone did not return the surveys. We discuss response rate and data availability in greater detail in Section 3 below.

To verify the data we conducted multiple phone and email follow-up sessions with any country for which clarification was needed. We also conducted a full set of internal consistency checks and verified the data against external data sources where available including the IMF-IFS statistics, the MIX and data from World Bank (2008) and Beck, Demirgüç-Kunt, and Martinez-

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<sup>11</sup> Additional surveys were received from Anguilla, St. Kitts and Nevis, St. Vincent and the Grenadines, St. Lucia, Dominica, Grenada and Montserrat.

Peria (2007). Where any discrepancies were found, respondents were contacted by telephone or email for further clarification.

Scatter plots of the comparison between the Financial Access Survey commercial bank deposit account penetration measure and measures from World Bank (2008) and Beck, Demirgüç-Kunt, and Martinez-Peria (2007) can be seen in Figure 2. In the two comparisons, differences come from changes over time and from the fact that the two previous efforts requested data on all deposit money banks which often included cooperatives and credit unions in the total, as is the case of Spain, Italy, and Austria.

### ***2.3 Advantages and Limitations of the Data***

Our approach has three important limitations which impact the comparability of our measures across countries and the uses to which they can be put:

Differential reporting: Not all countries report data for the same types of institutions which has implications for comparing data across countries. Specifically, data from non-banks seemed to suffer from greater underreporting bias than data from commercial banks. This bias expresses itself in two ways. First, and most common, many countries did not report anything for certain categories of institution (cooperatives for instance) though that type of institution was clearly operating within their jurisdiction. Second, in just a few cases, countries reported incomplete data for a given category (for instance, if the data reported comprised urban cooperatives but not rural cooperatives). Desk research showed this issue was not pervasive and was of small magnitude in most cases. For example, data from the Microfinance Exchange (MIX) showed that the number of loans and deposits from unregulated NGO-MFIs (which were unlikely to be represented in data sent to us by the central bank, since these institutions were not regulated) were a small fraction of those from regulated MFIs in most countries, which were again a small fraction of total loans. Having data disaggregated into multiple categories and data on which specific institutions are included in each category also helped mitigate these problems.

Unavailability of Certain Variables: By approaching Central Banks, the variables we can collect are often limited to data they have on hand, e.g. that provided in balance sheets, income statements, and standard regulatory reports. Many regulators were not able to provide our main statistics of interest, which were number of deposit accounts, number of loans, and bank branches. In addition, respondents often had trouble disaggregating data in the ways we had asked for it. Section 3 below discusses data availability in greater depth.

Inability to Measure Individuals: Finally, the main outcome variable, number of accounts or loans per 1000 adults, is not a perfect indicator of individuals with a loan or a deposit account. Double counting is a problem as people may have more than one bank account and/or have different accounts with different banks. Also, most countries do not make a distinction between government and corporate vs. individual deposit accounts. Another inconsistency stems from the different treatment of dormant accounts – some banks close dormant accounts after six months of inactivity, while other banks keep dormant accounts open for many years. See section 4.4 for a discussion of the correlation between accounts per 1000 adults, and the number of individuals with an account, which is strong despite the potential for double counting.

The main advantages of the approach taken here are the levels of disaggregation achieved both by type of product, and type of institution delivering the product. In many cases, respondents were able to provide data on the individuals and businesses having loans, as well as finer breakdowns for type of deposit account into time, savings, and checking. Disaggregation makes the data more useful, but also facilitates greater accuracy by showing more clearly what is missing and what is not.

### **3. Patterns of Bank Supervision and Data Availability**

Modern financial systems are complex and feature a great variety of regulated and unregulated financial service providers. In most countries there is no single central supervisor or coordinating entity for all financial institutions. However, the main financial authority, usually a central bank or bank supervisory agency, regulates some non-bank financial institutions along with banks in

about half of the countries in the world (Table 4). In many countries there are also non-bank regulatory authorities that may supervise or regulate (to varying degrees) cooperatives and credit unions, finance companies, MFIs, etc.

The patterns of supervision documented in Table 4 have consequences for the response rates for different data elements in the survey. Financial regulators tend to collect and publish data on the institutions they supervise and the data tend to reflect their policy priorities. This pattern shows clearly in Table 5, where volumes of deposits and loans; and data on branches and other forms of physical outreach are relatively available, the data on numbers of deposits and loans and numbers of individuals are relatively less populated. Volume data comes from balance sheets and is reported regularly for monitoring purposes and many countries require registering bank branches with the authorities. The collection of data relevant to financial inclusion is rarer, however, and is often lower priority and done on an ad hoc basis.<sup>12</sup>

### ***3.1 Data Available on Mutually Owned Financial Institutions (MOFIs)***

Even when financial cooperatives are regulated, few countries are able to provide financial access relevant data on them. In countries where cooperatives are supervised by the main financial regulator, less than 60 percent have data on the values of deposits and loans, and just a third on the number of accounts and loans. There is a significant difference in data availability by region. Latin America has the best data coverage with 80 percent of countries collecting data on values and 60 percent on numbers of loans and deposits. Sub Saharan Africa faces the greatest challenge in collecting data on cooperatives. In the region, only 20% of countries where cooperatives were regulated by the financial authority, had data on the number of deposits and loans. Many cooperatives are small and many of them do not have an MIS or even a computer, which likely accounts for some of this trend.

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<sup>12</sup> Many respondents reported collection the data on numbers of loans and deposit accounts in response to our request. In contrast, in many developed countries information on financial inclusion is collected through household surveys.

### ***3.2 Specialized State-owned Financial Institutions (SSOFIs)***

In most countries (62 out of 80 who report having specialized government institutions) the main bank regulator supervises government banks. Only in 18 countries these institutions are supervised by other government agencies, such as ministries of finance for development banks and ministries of post and communications for postal banks. Even though specialized state owned institutions are an important provider of services very few countries were able to provide values on the outreach of these institutions.

### ***3.3 Data Available on Microfinance Institutions (MFIs)***

A specific challenge in measuring microfinance is that it is not necessarily defined by the type of institution, but by the market segment these institutions serve. For example, many cooperatives operate in rural and poor areas and provide microfinance services. In some countries, banks entered the space traditionally served by microfinance, such as ICICI in India, Equity bank in Kenya, or BRI in Indonesia. Accordingly, only countries with separate licensing and regulatory requirements for MFIs were able to report data separately for these institutions - though many others presumably had healthy MFI sectors where the MFIs are registered as cooperatives, banks, or non-bank financial corporation of some other kind.

There are 57 countries in the world where MFIs are defined for regulation purposes as a separate institution type and regulated by the main financial regulator (Table 4). In 10 of these countries, multiple forms of MFIs exist, where at least one is regulated by another regulator. In these cases, there are often NGO MFIs which are loosely regulated by a ministry of the government and which provide credit services only, and deposit taking MFIs which are regulated and supervised by the main financial regulator. MFIs are supervised by the main financial authority in about a half of developing countries. A notable exception is Africa where in 80 percent of countries central banks supervise MFIs. This is a result of the recent drive to formalize microfinance operations and recognize the important role MFIs play in serving a large part of the market in

African countries.<sup>13</sup> Less than 10 percent of high income countries regulate or even have MFI institution as a category within regulatory framework.

### *3.4 Summary Statistics*

Table 6 presents the summary statistics of the main indicators used in our analysis. As already mentioned, data on commercial banks are the most comprehensive. The table also shows substantial variance among countries in the different indicators. The mean (median) of deposit account penetration in banks is 996 (702) accounts per thousand adults with 25<sup>th</sup> and 75<sup>th</sup> percentile values of 270 and 1498, respectively, while the average balance lies around \$7,725 (3,070) USD. On average, the average balance represents 2.6 times the GDP per capita (median = 0.94). The mean (median) of loan penetration in commercial banks is 299 (215) loans per thousand adults. The 25<sup>th</sup> and 75<sup>th</sup> percentile values for such variable are 42 and 431, respectively. The number of loans and the number of deposits per thousand adults in commercial banks are positively correlated, with a correlation of 0.72. In contrast, the average number of accounts or loans per thousand adults is much smaller in cooperatives, government banks, and microfinance institutions; for cooperatives, for example, the mean of such figure is 129. While the number of observations is smaller, these figures are not driven by sample selection.

The average (median) number of branches of commercial banks per thousand adults equals 16 (13). The penetration of branches among the population is positively associated with deposit and credit penetration, with correlations of 0.45 and 0.44, respectively. In contrast, the equivalent association with the proxy for geographic penetration is a bit weaker, with correlations of 0.34 and 0.35, respectively.

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<sup>13</sup> BCEAO countries did not respond to the survey. Recent years have seen a large number of African countries develop national microfinance strategies including the concept of special regulatory windows for deposit taking MFI banks designed to encourage the sector. See, e.g. Duflos and Glisovic-Mézières (2008).



#### **4. Financial Access around the World**

In this section, we use the Financial Access Survey data to roughly estimate the distribution of rates of deposit account ownership and access to credit around the world. We first use regression models and other data sources to fill in missing values for the numbers of deposit accounts and loans in different countries. From the filled in estimates we can generate worldwide totals for deposit accounts, and the breakdown by country (expressed as maps). We then use household surveys to estimate the average number of accounts per account holder which allow us to estimate the number of banked and unbanked individuals worldwide and broken into developing and developed countries.

There are two main difficulties which we face in these exercises. First, our estimate of the number of accounts per active accountholder comes from a very limited set of household surveys and so is quite rough (our error bands are very wide). This is a fundamental limit imposed on us by the availability of household survey data and our estimate should be treated as only a rough guess. Second, there is significant bias in the reporting of non-bank data relative to commercial bank data which we were not able to overcome when filling in the missing data with estimates or outside data sources. While we were fairly confident in our ability to generate a reasonable econometric model to predict rates of commercial bank account ownership, there were a number of factors which made us less confident in any similar attempt with the other categories, including the fact that the development these other categories tend to be influenced by specific factors in each country. We tried to fill in the missing values from other data sources, especially for the two main non-bank categories of MOFIs and SSFIs, but were not confident that the data we found were very comprehensive. Thus we expect that our estimates of non-bank accounts are extreme lower bounds and should be interpreted as such. Our estimates of commercial bank accounts are generated by statistical models and are as likely to be too high as too low for any given country, so our estimates of commercial bank account numbers are not lower bounds but best guesses. This implies that where we estimate a ratio of non-bank to bank accounts this ratio is also an extreme lower bound on the true ratio.

We also made a limited attempt to predict the distribution of commercial bank loans around the world. Here, we focused only on commercial banks because of data limitations. We did not attempt to estimate an aggregated figure for the number of loans because, unlike deposit service providers, there are a large number of non-regulated credit suppliers worldwide, rendering the estimation of a meaningful figure through regulatory data practically impossible.

#### ***4.1 Counting the Number of Accounts***

The broad coverage of our data allows us to develop a model to extrapolate out of sample to estimate the total number of bank accounts and their distribution around the world. To reach these estimates, we start with our survey data and develop a simple regression framework to impute values for some countries for which we don't have commercial bank or cooperative data. In addition, we attempt to fill in gaps in the non-bank data with data from other sources, including the MIX, CGAPs Occasional paper no. 8, the World Council of Credit Unions annual survey, and country sources. In order to express the uncertainty in the estimate we calculate a conservative "low estimate", a "preferred estimate" and a "high estimate" to give a sense of the range of values which may apply when we vary our assumptions. To generate the map and the count of accounts worldwide, we use the sum of the preferred estimates for commercial banks, cooperatives, government banks, and MFIs. The details of how numbers for each bank category were estimated are provided below, including the preferred estimate, and the high and low estimate reflecting different assumptions:

##### ***4.1.1 Commercial banks***

[*Preferred estimate*] We first construct a set of regression models to fit the relationships between log of account penetration on the LHS and per capita income, size of financial sector, population density, value of deposits per capita, number of commercial bank branches per person, and whether the country is in the high-income OECD category on the RHS. This specification choice reflects a balance between wanting a parsimonious model with reasonable explanations as to why each variable should be included (so that we can think through whether the model will hold up well in conducting out of sample predictions) vs. the desire to get the best within sample fit

(which would imply more variables and/or a highly non-linear terms). We use log of deposit accounts/1000 adults as the LHS variable in the regressions because the relationship with observable factors is more straightforward, and because doing so avoids predicting negative values for the total number of accounts. Using the log, however, presents a challenge because the predicted values must be retransformed and multiplied by adult population to calculate the total number of accounts in the country, and this process can induce a bias due to the effects of Jensen's Inequality. There are various methods to correct for this "retransform bias", but we choose the non-parametric smearing method (see Duan (1983)) retransformation correction which is robust to non-normal residuals (the residuals from some of our specifications do not appear to be normal based on a joint test of skewness and kurtosis). After generating a model, we then predict out of sample the number of deposit accounts per 1000 adults for the remaining countries and retransform the series to get the total number of accounts in each country. Where a given piece of data is missing for a given country (e.g. if we do not know the number of commercial bank branches in a country), a model with only the known elements is estimated and used to predict the number of deposits for the countries with that data element missing. In all the models were able to explain more than 70% of the variation in deposit accounts (within sample) and greater than 80% when all predictors were available. Table 7 contains the results of the different regression specifications; Table 8 describes the variables used in the different models.

#### ***4.1.2 Cooperatives, credit unions, and other mutually owned banks***

[*Preferred estimate*] For countries which did not report data on the number of deposit account in these institutions, we use the reported numbers of *clients* from the World Council of Credit Unions (WOCCU). In general, the WOCCU numbers should understate the true number of accounts in all mutually owned institutions, since they enumerate clients rather than accounts, and are voluntarily reported data for credit unions only, not all mutually owned institutions. Thus, we believe the WOCCU numbers are a very conservative estimate of the number of accounts.<sup>14</sup> For 13 countries in Europe for which there were no WOCCU data, we have data –

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<sup>14</sup> Nevertheless, there is a chance that some of the WOCCU members are unregulated institutions, and thus that the numbers reported by WOCCU are higher than what would have been reported by the financial regulator, implying

again enumerating the number of clients, not accounts – from the European Association of Cooperative Banks (EACB). For a few countries which do not report numbers of accounts or clients in the Financial Access Survey, WOCCU, or EACB but which report value of accounts, we conduct a simple regression based prediction of numbers of accounts from per capita income and the value of accounts in mutually owned institutions relative to total adult population. Table 9 contains the regression table which has an  $R^2$  of 0.8 with 22 observations. The parameter for log of income is -0.93 and the parameter for log of deposits per adult population equals 0.97, both significant at 1%. While it might seem somewhat surprising that the coefficient on income should be negative, this likely reflects the fact that, conditional on the amount of deposits relative to the total population, the higher income the country, the fewer individuals (and thus fewer accounts) these deposits represent. As we have a large number of small countries for which no data is available, we can also make assumptions about the distribution of the cooperative penetration variable for the missing values to improve our estimate. Specifically, in the preferred estimate, we assume that the countries with missing values (no reported values, no WOCCU or EACB data, and no predicted value from the regression) have an average cooperative deposit penetration which is close to the 25<sup>th</sup> percentile of the distribution of reported values. This would be a reasonable approximation, for instance, if many of the countries which did not report numbers had smaller cooperative sectors than the ones who did. As table 10 shows, the bulk of the accounts we count (92%) come from actual reported data including our survey data, data reported to WOCCU or EACB or from direct communication with regulators (CGAP numbers).

[*High estimate*] The “high estimate” is the same as the preferred estimate with the exception that we assume the average of the missing values are closer the 50<sup>th</sup> percentile of the observed distribution.

[*Low estimate*] Here we assume that the missing values are zero.

#### **4.1.3 Government savings banks**

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that compared to countries for which we have survey responses, WOCCU will overstate the number of accounts in regulated MOFIs.

[Preferred estimate] The great heterogeneity in the form and function of government banks and the likelihood that there is only one or two (or zero) in any given country renders suspect any econometric regression estimates as were attempted above for commercial banks. Similar to the MOFI estimate, we start with the reported data we have and fill in missing values with data from a previous counting exercise conducted by CGAP presented in CGAP Occasional Paper no. 8. Since this older data is likely to underestimate the true numbers and because there are many countries which likely have government run deposit taking institutions such as national savings banks or postal banks but for which we have no data, we believe our estimates understate the true value.

[High estimate] We don't make a high estimate (i.e. we assume it's the same as the preferred estimate) given the likelihood that there is only one or two (or zero) specialized government banks in any given country.

[Low estimate] We use only our reported numbers and leave out the numbers from CGAP Occasional Paper no. 8 on the grounds that in a few cases, they may be double counted as commercial banks, despite their state ownership (we believe this is may have occurred in just a few cases).

#### ***4.1.4 Microfinance Institutions***

For MFIs, we take data from the MIX and use it to supplement our own data for countries which reported nothing. Many MFIs are licensed as a commercial bank, cooperative, or NGO and thus might be counted in the numbers for other categories supplied to us by the regulator so we have removed cooperatives and banks from the MIX data. Since the MIX data are voluntarily reported, and because the data reported to us in our survey covers only 17 countries, we believe these estimates are significantly on the low side. Also, though most of the reported account numbers from the survey data will be from regulated institutions that have a supervisory relationship with the main bank regulator, the MIX includes many institutions which are not supervised or regulated.

#### ***4.2 Mapping Bank Accounts around the World***

The map in Figure 5 shows a total number of deposit accounts per thousand adults using a combination of account numbers collected through Financial Access survey where available and the estimates generated through the above procedures. The deposit account penetration ratios represent all deposit accounts summed across the various categories (in most countries, commercial banks are the vast majority).

As the map shows, rates of deposit account ownership in formal institutions vary greatly around the world. Of the seven countries which have fewer than 100 bank accounts per 1000 adults, five are in Africa —Congo D.R., Burundi, Madagascar, Mauritania, and Ethiopia. High income countries exhibit the greatest levels of deposits penetration with an average of over 2000 accounts per 1000 adults.

Underlying the wide variation in rates of account ownership are large differences in the ability of poor households to access formal savings. In recent household surveys, Rwanda, Pakistan, Malawi, and Uganda<sup>15</sup> all reported less than 20 percent of households save through formal institutions, and Financial Access Survey data shows them to have fewer than 225 bank accounts per 1000 adults. In contrast, a recent study by the European Commission calculates that in Belgium and the Netherlands, greater than 98 percent of households have bank accounts and survey data show them to have over 1500 accounts per 1000 adults in commercial banks.<sup>16</sup> The trend is that higher rates of bank account ownership equate to more banked individuals in the population (see also section 3 above for the results of regressions of deposit penetration on reported numbers of banked adults in a country).

#### ***4.3 The Number of Accounts Worldwide***

Adding all the predicted and reported values puts global number of bank and non-bank accounts in the world at approximately 6.2 billion or more than 1 for each adult on the planet (and nearly 1 for each of the 6.7 billion people on the planet).<sup>17</sup> While there are more than enough accounts to

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<sup>15</sup> FinScope Rwanda (2008); FinScope Pakistan (2009) ; FinScope Malawi (2008) ; FinScope Uganda (2006).

<sup>16</sup> In Belgium 3,724 and the Netherlands 1,772 accounts per 1000 adults. European Commission (2008)

<sup>17</sup> These numbers are necessarily rough and likely to have a wide margin of error. In the estimation for commercial bank accounts, the estimated margin of error is approximately 6%. The margins of error for the non-banks are likely

go around, they are not distributed equally. If we divide the number of accounts in each country by the adult population, we obtain an estimated figure of 3.2 accounts per adult in developed countries, but fewer than 0.9 accounts per adult in developing countries. It should be noted that these accounts are not all held by individuals, but also include accounts held by businesses and government agencies.<sup>18</sup> Neither are they evenly distributed within countries; in poorer countries household surveys show that the majority of accounts are often held by the well off.

According to the estimates presented in Table 13, banks are the main providers of deposit services holding over 80 percent of all deposit accounts in the world (Table 13). At least 20 percent of accounts are held outside the commercial banking sector in cooperatives, credit unions, government banks, and MFIs. Due to data limitations and the conservative nature of our assumptions during the counting exercise, the estimate of the number of accounts in non-bank institutions is likely more conservative than the one for banks, understating the true size of non-bank sector.

Though the numbers are rough, Table 13 shows large differences in the structure of the non-bank markets in developing and developed countries. In developed countries, nearly 16 percent of accounts are held with cooperatives, credit unions, and other institutions with a mutual ownership structure compared to an estimated 3 percent in developing countries (though, again, the true share of cooperatives in developing countries is likely to be underestimated). Public institutions such as postal and specialized state savings banks are also important providers of savings services in developing countries, holding 14 percent of total deposits. Microfinance institutions, as a separately regulated type of institution, hold only about 2 percent of deposits and are concentrated in developing countries.

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larger as it is difficult to tell how many accounts are not being counted in the countries for which no data was reported, and how many do not get reported in the countries which did provide numbers.

<sup>18</sup> The Financial Access Survey did not ask for the breakdown of deposit account data by individuals and businesses, but it is likely that these business and government accounts to be an important fraction of the total in some cases.

#### *4.4 Conversion Factor: Converting the Number of Accounts to the Number of Account Holding Individuals*

It is possible to convert our data and estimates of the number of accounts in each country into rough estimates of the number of banked individuals in each country. To do so, we have to estimate a conversion factor, which is the number of accounts in a country, per banked individual in each country.<sup>19</sup> We use data from household surveys to estimate the number of individuals who have savings accounts in formal financial institutions (which could be any of our institutional categories) and divide the number of accounts in the country by this number.

We begin by evaluating whether our main measure of deposit account penetration, namely the number of accounts per thousand adults, are significantly correlated with some more accurate indicators of financial access, which are available for some countries through household surveys. A regression of the reported rates of formal account ownership from household surveys on our proxy for deposit penetration, namely number of accounts per thousand adults (in logarithms), shows that the deposit penetration indicator is a good predictor of true financial inclusion, at least in the limited sample of countries for which we have comparable household level data. Figure 1 shows the added variable plot for the log of deposit penetration; the fit is very close. Next, Table 14 shows the results of three bivariate regressions with rates of account ownership from household surveys on the LHS and log of deposit penetration on the RHS. In the first model, only surveys completed since 2003 are included, in the second model, the sample is further restricted to surveys which have all adults as the survey frame (as opposed to all households), the final column are all available surveys (which go back to 2000). The coefficients are largely similar across the three samples, and the  $R^2$  is 0.69 and 0.71 when only more recent (and thus more accurate) surveys are used. These results confirm that the deposit penetration ratio can be used to predict the percent of the population with a bank account to a fair degree of accuracy. Table 17 provides a list of household survey data and the sources.

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<sup>19</sup> This is not necessarily the same as the average number of accounts held by each account holder since business and government accounts will be counted in the numerator.



To create our preferred estimate of the conversion factor, we select the available 15 household surveys conducted in 6 developing and 9 developed countries since 2003 (see Table 15 for list of survey sources) and which have reported data for two categories or more (commercial banks plus one of MOFIs or SSFIs).<sup>20</sup> To assure numbers are comparable across countries, we restrict our sample to only those surveys which use all adults as the survey universe. The mean value of the conversion factor is 2.96 and the 90% confidence interval is from 2.0 to 3.9 (Table 16). As a round number, there appear to be approximately 3 accounts per person on average.

Table 17 also shows two variations to calculate a conversion factor. In the one, we use all countries with household survey data and use both predicted and reported values of account numbers. This expands the sample to 28 countries and produces an estimate of 3.2 total accounts per banked individual for the conversion factor. The final method uses only reported data for commercial banks under the assumption that the number of commercial bank accounts provides a reasonable signal for estimating the number of individuals with bank accounts. This method uses 17 countries and calculates a conversion factor of 2.5 *commercial bank* accounts per banked individual.

This approach to calculating the conversion factor is admittedly a very rough estimate (as is confirmed by the wide confidence intervals). Though we believe the simplicity of the calculation is a virtue, there are a few simple corrections which we contemplated, but which the data indicated were not warranted.

First, because the Financial Access survey data on number of accounts comes from 2008 data but the household survey data come from various prior years, any worldwide upward trend in account ownership would systematically inflate the conversion factor for older surveys. If older household surveys systematically underestimate the true number of banked adults who currently own accounts, one might expect a negative relationship between survey year and number of

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<sup>20</sup> We calculate the conversion factor as the number of accounts from all sources relative to the number of banked adults. In the conversion factor calculation we drop countries for which we have only commercial bank data and no reported number for government or cooperative accounts (3 surveys) so that the conversion factor better measures this ratio (rather than measuring the number of commercial bank accounts per banked adults). When we do the final calculation, we use predicted values for cooperatives and government accounts in countries where no data were reported.

banked adults. However, a regression of accounts per adult on the year the household survey does not show a significant relationship.

Second, one might also imagine that the conversion factor would vary significantly with the level of economic development of the country, however there was not a significant difference in the means between the developing and developed sample nor was there a significant relationship when regressing the conversion factor on log of GDP per capita. This result seems surprising, given the anecdotal evidence that individuals in richer countries often hold more accounts per person. One possible explanation could be that though the typical adult in a developed country may have more accounts on than her developing country counterpart, the ratio of business and government accounts to individual accounts is likely higher in developing countries (due to fewer individual accounts) which drives back up the ratio of accounts to banked adults.<sup>21</sup>

#### ***4.5 Estimating the Number of Unbanked Individuals in the World***

To make a final estimate of the number of banked adults around the world, we divide the number of accounts in each country by the conversion factor. When the resulting number is greater than the number of adults in the country (as was the case in a few countries with higher than 3000 accounts per 1000 adults) the number of banked adults was set to the total number of adults. Assuming 3 accounts per banked adult on average puts the number of un-banked adults in developed countries at approximately 160 million or 19 % of all adults, and at 2.7 billion adults or 72 % of the adults in the developing countries.<sup>2223</sup> Table 17 shows how this breakdown varies using the high and low confidence interval values for the conversion factor.

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<sup>21</sup> Desk research into a few country examples showed a high ratio of government and business accounts in developing countries.

<sup>22</sup> CGAP Occasional Paper no. 8 estimates the number of savings and loan account holders in non-banks to be 500 million, leaving 2.5 billion poor around the world who do not get services from non-banks. CGAP Occasional Paper no. 8 numbers are not directly comparable to the ones presented in this report as they don't include commercial banks and because they add together loan and deposit accounts. Never the less, their estimate of 2.5bn unbanked poor is similar in magnitude to the estimate presented here of 2.7bn adults in developing countries (some of which may not be poor).

<sup>23</sup> It should be emphasized that the percentages reported are of all adults, not percentages of households banked.

Clearly the numbers are rough but give a sense of the scope of the problem of financial exclusion. In developing countries, somewhere near 70% of adults have no recourse to formal savings. These figures present a challenge to policy makers and those in the development community.

#### ***4.6 Estimating the Number of Commercial Bank Loans in the World***

We also made a limited attempt to predict the distribution of commercial bank loans around the world for purposes of filling in the map in Figure 6. The prediction exercise is similar, but is based on a single regression. The prediction of the number of loans per thousand adults was carried out only for commercial banks, mainly because of data limitations. Furthermore, we did not attempt to estimate an aggregated figure for the number of loans because, unlike deposit service providers, there are a large number of non-regulated credit suppliers worldwide, rendering the estimation of a meaningful figure through regulatory data practically impossible. The rationale for these covariates is straightforward, as richer countries tend to have more developed credit markets, and more and better information exchange among lenders is often associated with deeper creditor markets. We model the number of loans per thousand adults (in logarithms) as a quadratic function of (the logarithm of) GDP per capita and the 2009 Credit Information Index of Doing Business.<sup>24</sup> The results are presented in Table 18. Our preferred specification is presented in column (1). We estimate this model using a sample of 69 observations. The adjusted  $R^2$  is 0.82. In column (2), we present an alternative specification using the value of loans in commercial banks instead of income per-capita. The idea behind this specification is that the average loan is relatively the same across different countries, although in reality, this is not the case. The fit in terms of  $R^2$  is slightly better (Adjusted  $R^2 = 0.86$  vs. 0.82); however we stayed with our previous specification as GDP per capita is available for a larger number of countries.

Figure 6 shows the worldwide penetration of loans, measured by the number of commercial bank loans per thousand adults, using a combination of the numbers collected through the Financial

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<sup>24</sup> We tried other specifications (using levels instead of logs), but the fit was worst. We also include as explanatory variable the ratio of domestic credit to GDP; however, because of our reduced and selected sample of high-income countries, including this covariate gives inaccurate estimations for developed economies.

Access survey and the estimates generated through the methodology already described. The penetration of loans varies widely across countries and is closely correlated with economic development. Developed economies have the largest number of loans per thousand adults. What's more, it is likely that this figure underestimates the true amount of loans in these countries due to the presence of a large number of highly-developed unregulated lenders. In Eastern Europe and Central Asia, there are, on average, 367 loans per thousand adults. Latin America and South Asia follow with 314 and 268, respectively. Middle East and Africa are the least developed markets.

## **5. Which Country Characteristics Are Correlated with Outreach of the Financial System?**

This section explores the empirical relationships between our financial access indicators and an array of country-level variables that intuition, theory, and previous empirical work suggest might be relevant. Cross-country analyses such as these suffer from a number of fundamental problems (including omitted variables and reverse causality) which make it impossible to infer a causal relationship between the independent and dependent variables, even when the regression coefficients are statistically significant. In measuring the correlations and conditional correlations with regressions we do not hope to imply any causal relationships, but simply to map out the main relationships and features of the data. A similar exercise was carried out in Beck, Demirgüç-Kunt, and Martínez-Peria (2007). In that paper, the authors correlate deposit and loan penetration with various factors from the empirical literature to explore the determinants of financial development. We improve on their effort by using a larger sample of countries and newer data. As a rough guide, we rely on the framework outlined by Beck and de la Torre (2006) to determine which factors are likely to impact financial outreach and thus should be included in our analysis.

We divide the analysis into three areas: savings, credit, and physical outreach. Table 19 provides correlations between all of our indicators of account penetration, loan penetration and demographic penetration of branches and all explanatory variables. Tables 20-23 rely on a theoretical framework and build simple OLS specifications to estimate the relationship between a

single country-level covariate, for example the quality of information in credit markets, and our indicators of financial usage and banking sector outreach, controlling for the overall level of economic development and/or population density as a catch of all for the many other factors which may affect the outcome variable.<sup>25</sup> Here, the coefficients are identified by the difference of these covariates across countries. Throughout our analysis, we categorize the differences in development, institutions, and economic policies across countries as arising as the result of “market-developing” or “market-enabling” policies.<sup>26</sup>

### 5.1 Savings

We begin by studying the determinants of the number of deposit and saving accounts. Here, our dependent variable is (the logarithm of) the number of accounts in commercial banks per thousand adults. The results are presented in Table 20. We start by analyzing the role of factors that generally call for *market-developing* policies.<sup>27</sup> Specifically, we estimate the correlation between the number of accounts per thousand adults and different variables reflecting macro-economic and development conditions that are likely to affect the supply of deposit services in a country. We consider first the role of economic development, income inequality, and population density. Broadly speaking, these variables reflect the importance of income and market size on the provision of financial services, although they might also be catchall proxies for other factors which are correlated with the level of economic development. Consistent with previous research, the first column in Table 20 shows that there are fewer accounts per thousand adults in countries with low per capita income. In fact, as evidenced by the high  $R^2=0.64$ , GDP per capita accounts for a large part of the cross-country variation in deposits penetration. The second column adds population density, as measured by (the logarithm of) population divided by area. Even controlling for per capita income, density is significantly correlated with the number of deposit

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<sup>25</sup> We use this specification because there is not enough variation in the data set to identify the coefficients when all the variables are included at once. This raises the concern that despite controlling for per capita income, there may be important unobserved heterogeneity among countries correlated with our covariate of interest. We cannot overcome this problem.

<sup>26</sup> Market-developing policies expand the possibilities frontier through structural reforms that improve institutions and other state variables. In contrast, market enabling policies modify the incentives and constraints faced by financial institutions in different regulatory environments

<sup>27</sup> In Beck and de la Torre (2006) the authors describe factors that call for *market developing* policies as requiring profound structural reforms and tend to change slowly over time.

accounts. Population density might be expected to correlate with financial access through a number of channels. Among other things, more dense areas are easier to supply with infrastructure and other services. Also, since one bank branch can serve more customers in a dense area, banks may make greater investments in banking infrastructure in high population density areas [see, e.g. Calem and Nakamura (1998)]. In the section on physical outreach, we find that density is indeed related to greater branch penetration. Given these results, in what follows, we include these two variables as controls for the level of development. In the third column, we add the Gini coefficient to the previous model to test any relationship between income inequality and account ownership. We find no significant association between the income distribution and our dependent variable, after controlling for income per capita and population density.<sup>28</sup>

Next, we study the relationship between variables that measure macro-economic stability and deposit penetration. Previous research has shown there may be a two-way relationship between stability and financial development. On the one hand, inflation and other forms of instability may impair the growth of a robust banking sector [see e.g. Rousseau and Wachtel (2001)].<sup>29</sup> On the other hand, a strong and well regulated banking sector may dampen macro economic shocks or prevent them from occurring thus implying a negative relationship between measures of the development of the system and instability [see, e.g. Tornell and Westermann (2003)]. In column (4), we add to our basic specification the average inflation (in terms of CPI) during the last ten years to proxy for macroeconomic stability. As might be expected from the work cited above, inflation has a negative and significant effect on deposit penetration. Yet given the many channels by which these variables may affect each other, it is especially important not to impute any causal interpretation to the relationships we find. Column (5) studies the association between explicit deposit insurance and deposit account ownership. The column shows our basic specification and a dummy variable coded one if the country had deposit insurance in 2003 and

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<sup>28</sup> In an unreported regression, we also include an interaction term of the Gini coefficient and the log of GDP per capita. None of the covariates are statistically significant.

<sup>29</sup> In theory, the effect of inflation on savings is ambiguous. In general, while inflation affects negatively the value of savings by lowering the real value of wealth, it may also mobilize savings into the system as households might prefer to save in banks provided that the nominal interest rate is sufficiently high, rather than in the form of money. It is also possible that households might prefer to raise their savings rate in order to offset the negative wealth effect.

zero otherwise [data on deposit insurance comes from Demirgüç-Kunt, Karacaovali, and Laeven (2005)]. The indicator variable is positive and significant; once we control for per capita income and population density, countries with deposit insurance have more accounts per thousand adults than countries without deposit insurance.<sup>30</sup> Taken as a whole, there is some evidence that macroeconomic stability is associated with a deeper penetration of deposits.

Columns (6) – (9) present the regression results of the impact of infrastructure and political stability on deposit penetration. Deficiencies in infrastructure can drive up costs for financial institutions to supply financial services; may impact business activity, reducing demand for financial services; and (in the case of transport and information infrastructure) may imply higher transaction costs for customers to access services. In fact, countries with higher electricity consumption and more phones per capita have, on average, more accounts per adult. In contrast, while a deficient transportation infrastructure might increase the cost of outreach into more remote areas, the density of roads comes in negatively and not significantly. Although political instability and violence can increase the cost of doing business, this variable is not significantly associated with deeper penetration once per capita income is taken into account. Finally, column (10) considers economies designated “offshore financial centers” by the IMF, whereas we would expect to have greater numbers of accounts per resident, as they often hold accounts for large numbers of non-residents. The sign of the indicator variable, however, is contrary to expectations and not significant, which may reflect the fact that we do not include most of the small islands in the Caribbean or the fact that many offshore centers do not specialize in banking services but instead more advanced financial instruments.<sup>31</sup>

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<sup>30</sup> Our regression analysis uses an indicator variable that takes one if there is a deposit insurance scheme in place in the country, and zero otherwise. This is for simplicity and thus the result should be taken with caution. On one hand, the result does not provide any evidence of causality. On the other hand, there is a well established literature showing that the moral hazard engendered by overly generous deposit insurance schemes leads to greater instability and slower long-run financial development [Demirguc-Kunt, Kane, and Laeven (2008)].

<sup>31</sup> In unreported regressions, we estimated separately the relationship between deposit penetration and two indices, namely the Creditor Rights Index and the Credit Information Index, controlling for (the logarithm of) per capita income and (the logarithm of) population density. Both indices enter with a positive sign and are statistically significant. In theory, however, these indices should not affect directly the number of deposit accounts, so it is likely that they are simply a proxy for unobserved variation in the development of financial systems or financial reforms.

The second panel in Table 20 reports the results of the impact of different *market-enabling* policies on the number of deposit accounts [see Beck and de la Torre (2006)]. These policies tend to provide incentives (or constraints) to financial institutions to operate more efficiently or to broaden their customer base. The one measure of these policies is the level of competition in the banking sector. Competitive pressures and the search for profits are key factors for institutions to innovate, expand their customer base, and offer accounts to underserved clients. Here, we follow Beck, Demirgüç-Kunt and Martinez-Peria (2008) and proxy competition with bank concentration, which we approximate by the share of deposits in the five largest banks. Column (12) presents the results. Consistent with the theory, higher concentration in the banking sector is associated with lower deposit account penetration, although this result is only significant at a 15% level. Next, we analyze the role of bank ownership which is a proxy for the threat of entry as well as quality of management. These data are from Barth, Caprio, and Levine (2004). Their government and foreign ownership measures are not statistically associated with measures of deposit penetration. In columns (15) - (23), we study the relationship between price and non-price barriers and financial outreach. We begin by analyzing the role of barriers to open a bank account. Our focus here is on five variables: KYC requirements, exceptions to these requirements, the existence of regulatory requirements for banks to offer basic or low fee accounts, the number of document required, and the minimum balance to open a checking account (as percentage of GDP per capita). The first three variables are from the *Financial Access Database (2009)*; the fourth is from World Bank (2008); the last one is from Beck, Demirgüç-Kunt and Martinez-Peria (2008). Broadly speaking, the signs of the coefficients support the idea that countries with lower barriers are associated with higher deposit penetration, although none of the coefficients are statistically significant. In columns (20) and (21), we assess whether policies to encourage people to save, such as tax incentives or annual fees, are associated with deeper deposit penetration. Neither variable enter significantly. Finally, in the last two columns we investigate whether regulatory policies aimed to foster financial inclusion are associated with a deeper account penetration. Specifically, we study the role of agents and postal banks. In the first case, we use an index of the extent to which agents are allowed to



perform savings operations.<sup>32</sup> In the later case, we use a dummy variable that equals one if financial services are offered in the post offices and are handled by a separate private operator and zero otherwise. These variables are from the *Financial Access Database (2009)*. Although the signs are as expected, none of these policies are significantly associated with broader access.<sup>33</sup> This evidence, however, is not enough evidence to suggest that these policies do not matter.

## ***5.2 Credit***

Table 21 presents the regressions of those factors associated with loan penetration, in which the dependent variable is (the logarithm of) the number of outstanding loans in commercial banks per thousand adults in 2008. In addition to costs, the outreach in the supply of credit (unlike the supply of deposits) is constrained by risks, in particular default and agency risks. Therefore, the penetration and quality of credit depends not only on the economic conditions, but also on the financial infrastructure available to manage these risks.

We start by analyzing the relationship between measures of economic and development conditions and loan penetration. In the first regressions, we only include (the logarithm of) per capita income and (the logarithm of) population density as independent variables. Not surprisingly, GDP per capita explains a large part of the cross-country variation. Since population density is not statistically significant, in subsequent regression, we only include (the logarithm of) GDP per capita as control.

In terms of structural factors, inequality and inflation appear in the regressions with a negative sign, but neither is statistically significant. Columns (5) - (7) parallel the results of the previous sub-section, namely that better physical infrastructure is positively and significantly associated

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<sup>32</sup> We tried an alternative specification using a dummy variable coded one if the country allows the use of agents. The coefficient is not statistically significant. These variables, however, measure regulations at a very high level. Interviews with policymakers show that these regulations often contain detailed provisions, making implementation difficult and reducing uptake suggesting that more granular data on regulations are necessary to draw conclusions.

<sup>33</sup> Allowing private entities to provide financial services through postal agencies enters significantly if we do not control for population density.

with loan penetration. In column (8) we include contract enforcement days as a proxy for the efficiency of the legal system. In principle, loans should be more prevalent in more efficient legal systems. While this variable usually enters significantly in other work using private credit to GDP as dependent variable<sup>34</sup>, the coefficient here is not statistically significant. A possible explanation is that the quality of courts matters for business loans, but not so much for individual loans which constitute a large proportion of loans granted by commercial banks. Column (9) shows no significant relationship between political violence and number of loans. Finally, columns (10) and (11) consider the role of financial infrastructure which creates mechanisms for lenders to screen borrowers and enforce repayment. As proxies for such mechanisms, we use the Creditor Right Index developed by Djankov, McLiesh, and Shleifer (2007) following La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997, 1998) and the Credit Information Index introduced by Djankov, McLiesh, and Shleifer (2007) and updated in “*Doing Business 2009*” [World Bank (2009)]. The results show that the number of loans per thousand adults increases as the contractual and informational frameworks, as measured by these two indices, improve.

The bottom part of Table 21 explores the relationship between policies that may broaden access and the penetration of loans in the population across countries. In column (12), we include into our baseline regression our proxy for bank concentration. Concentration tends to be negatively and significantly associated with the supply of credit. The ownership structure of the banking sector, in contrast, is insignificantly correlated with the loan penetration. Columns (15) – (18) of Table 20 add to our baseline regression four measures of non-price barriers to accessing credit: (1) The number of locations to submit a loan application, (2) the minimum amount of consumer loan banks make expressed as a percent of GDP per capita, (3) the average fees banks charge on consumer loans expressed as percentage of GDP per capita, and (4) the average number of days banks take to process a typical consumer loan application. All these figures are from Beck, Demirgüç-Kunt and Martinez-Peria (2008). Holding per capita income constant, these barriers are not significantly correlated with the penetration of loans in the population. The last column

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<sup>34</sup> See for instance Djankov, McLiesh, and Shleifer (2007)

explores the role of extending credit through agents and uses an index of credit services that agents are allowed to do. We find no significant association of our index and loan penetration.<sup>35</sup>

### ***5.3 Outreach***

Financial inclusion is unlikely to improve without sufficient physical access points where clients can access the financial system. A client who must travel long distances to the nearest branch or ATM to deposit or borrow a few dollars is likely to opt out of the formal financial system. Evidence seems to support this story. In columns (11) and (12) in Table 20, for instance, we show that there are more deposit accounts per thousand adults in countries with deeper demographic and geographic branch penetration. And research indicates that banks also find it difficult to lend to distant clients, especially to more “informationally opaque” clients such as SMEs [Petersen and Rajan (1995), Mian (2006)]. Another line of research shows that developing financial services at the local level can improve local GDP growth and other economic outcomes [see Kendall (2008), Burgess and Pande (2005), Guiso, Sapienza, and Zingales (2004)]. Since the extension of financial services to more localities is mostly a matter of increased branching, these results show the importance of analyzing outreach as its own phenomenon.

To evaluate some of the factors associated with more intensive physical outreach, Table 22 and Table 23 present OLS regressions using several measures of economic and institutional conditions that, in theory, influence transaction costs and therefore, can limit access to financial services. In these tables, we use the number of branches per 100,000 people and the number of branches per squared km (both in logs) as measures of demographic and geographic branch penetration, respectively. The first column in both tables presents our basic specification. Not surprisingly, the evidence shows a strong positive correlation between both measures of outreach and GDP per capita. In contrast, population density is statistically significant only in the geographic specification. In the second column, we investigate the relationship between income distribution and outreach. Contrary to the results in the previous sections, income inequality is

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<sup>35</sup> It is worth noting that both variables (operations savings and operations credit) reflect the regulations as written rather than how they are implemented in practice and exercised by those who are subject to them.

negatively correlated with both, demographic and geographical outreach. Column (3) shows no statistically significant relationship between the rate of inflation and any of our outreach measures. In contrast, indicators of physical infrastructure are positively associated with banking sector outreach, possibly because good infrastructure reduces the costs of opening and operating branches (though there are many other unmeasured factors which may also drive the result). Column (8) shows that, after controlling for the effects of income and population density, there is no significant correlation between absence of violence and neither of our measures of outreach. Contrary to our previous results, concentration is not significantly associated with either measure of branch penetration. Finally, in column (10) we show that a regulatory barrier such as requiring approval by the financial regulator to open a branch is not significantly associated with lower branch penetration.<sup>36</sup>

In sum, the estimates in Tables 19 – 23 yield interesting results. The first one is obvious, GDP per capita is strongly positively associated with all measures of financial inclusion; it explains a large fraction of the cross-country variation. Second, after controlling for per capita income, variables which reflect the institutional and development conditions and that are largely outside of the control of financial regulators are also associated with a broader penetration of financial services. More specifically, measures of physical infrastructure, such as phone line penetration and electricity usage, are positively associated with all four measures of deposit penetration, loan penetration, and geographic and population based branch penetration. Lower inflation is also positively associated with deposit penetration. While these results probably confound the direct impact of better infrastructure or inflation control with other aspects of economic development and macroeconomic management, these results highlight the fact that some of the factors which affect the ability of policy makers to set conditions for greater financial inclusion are outside of their direct control. Third, there is also a significant relationship between measures of deposit and loan penetration and variables which might plausibly be within the control of financial regulators and policy makers. In particular, financial infrastructure, as measured by better

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<sup>36</sup> Cross-country analysis among richer countries shows that requiring branch approval is correlated with lower branch penetration. This relationship is statistically significant even after controlling for income, population density, and other factors.

contractual and informational environments in credit markets, is positively associated with broader lending. Similarly, the presence of deposit insurance is also associated with more deposit penetration<sup>37</sup> while higher levels of concentration in the banking sector are positively associated with more limited penetration of deposit and loans in the population, pointing to a possible role for competition policy in determining the degree of financial inclusion. Finally, while significant alone, once per capita income is taken into account, there is no significant association between increased financial penetration and the presence of any of the policies which have financial inclusion as a central goal. While cross-country OLS regressions are a very blunt tool and not really appropriate for measuring the impact of specific policies, these results support previous findings in the literature regarding the interaction between the macro/institutional environments and individual policies. These results, however, should not be interpreted as evidence of failure of any of these policies, but rather as a call for micro-studies to evaluate the effectiveness of measures aiming to improve access to financial services.

## **6. Conclusion**

This paper introduces a new set of financial access indicators for 139 countries across the globe and describes the results of a preliminary analysis of the data. Despite its limitations, this data set is one of the few sources of information which could be used to assess and compare the degree of financial inclusion across countries. It also allows us to make back of the envelope estimates of the total number of bank accounts in the world and the number of individuals who have access to them. Despite the apparent overabundance of approximately 6.2 billion bank accounts in the world - more than one per adult - a disproportionate amount of the accounts - 3.2 per adult - are located in the developed world economies, while the equivalent figure in the developing world reaches is only approximately 0.9 per adult, inclusive of accounts which are not owned by individuals, such as those owned by government and business entities. In addition, our estimates indicate that roughly 19% of developed world adults do not have bank accounts (though many

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<sup>37</sup> Although the causal chain could easily run in the opposite direction, if deposit insurance schemes are more often adopted as more individuals begin to own accounts.

may live in households where other members have accounts), whereas nearer to 72% of adults in the developing world do not have accounts. Even at the very low level of precision possible in this type of exercise, these numbers indicate a major gap that has not yet even begun to be addressed by the many policy initiatives currently underway or by the microfinance movement. Finally, we investigate the relationship between deposit, loan, and bank branch penetration with other variables and find significant associations of deposit and loan penetration with per capita income, physical and financial infrastructure, and macro-economic stability, but no significant association with policies which have financial inclusion as a central goal.

Having appropriate data is crucial to understanding and measuring financial inclusion. The data introduced in the *Financial Access Database* should be viewed as an attempt to generate consistent cross-country indicators of financial penetration around the world. Yet, as an effort to document access to financial services worldwide, it faces many challenges. Many countries do not collect information on key variables and most have incomplete data on the non-banking sector. There is the need to improve the quality and availability of financial access data, both by improving and extending cross-country indicators as well as employing country-specific-in-depth diagnostics. Additionally, data are often collected on an ad-hoc basis. To be useful, indicators must be collected on a repeated, regular basis, so that policymakers can set priorities and track changes. Finally, supply-side data must be complemented with other efforts, mainly through household surveys, to estimate accurately the characteristics of the population with access to the financial system. Since this could be a time and resource-intensive exercise, an alternative could be the use of quick financial access surveys or ‘snapshots’. These snapshots should not be intended to replace deeper country-level surveys, but could provide a usefully broad framework in which to set other sources of information. In the end, these efforts should complement each other to provide a broader picture of financial inclusion in order to identify obstacles and design policies to overcome them and ultimately expand access.

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**Table 1: Definitions of different bank types: Commercial banks, MOFIs, SSFIs, MFIs, and Other, as shown in the survey questionnaire.**

For each type, respondents were asked: (1) For each category, provide the type of the institutions that you supervise/regulate and (2) For each category, provide the type of the institutions that you do NOT supervise/regulate and indicate who does.

DEFINITIONS	
<b>Commercial Banks</b>	Banks with a full banking license. In some countries, the term universal banks, or other terms may be used. Majority government/State owned banks should be included in this category to the extent that they perform a broad set of retail banking functions
<b>Cooperatives, Credit Unions, &amp; Mutuels</b>	These are financial institutions that are owned and controlled by their members (customers).
<b>Government Savings or Development Banks</b>	Specialized state owned institutions or extensions of the government whose main purpose is to lend to support economic development and/or to provide savings, payment, and deposit services to the public. (Includes postal banks, government savings banks, SME lending facilities, agriculture banks, development banks, etc.)
<b>Microfinance Institution</b>	Institutions whose primary business model is to lend to (and possibly take deposits from) the poor, often using specialized methodologies such as group lending.
<b>Other institutions providing loans and/or deposit services (institutions which do not fall into other categories)</b>	Any other financial institutions which do not fall into the above categories and provide standard loans and/or deposit services, for example leasing and factoring companies

**Table 2: Survey table requesting various data elements**

<b>Table 2: Statistics</b>	<b>Commercial Banks</b>	<b>Cooperatives, Credit Unions &amp; Mutuels</b>	<b>Government Savings or Development Bank</b>	<b>Microfinance Institutions</b>	<b>Other institutions providing loans and/or deposit services</b>	<b>Total</b> (for the whole financial system)
Indicate the number of institutions in each category	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
<b>Deposits (please enter full numbers)</b>						
Total <b>number</b> of deposit accounts	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Total <b>number</b> of <b>checking</b> deposit accounts	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Total <b>number</b> of <b>saving</b> deposit accounts	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Total <b>number</b> of <b>time</b> deposit accounts	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Total <b>value</b> of deposit accounts	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Total <b>value</b> of <b>checking</b> deposit accounts	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Total <b>value</b> of <b>saving</b> deposit accounts	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Total <b>value</b> of <b>time</b> deposit accounts	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Total number of <b>individuals</b> with a deposit account	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
<b>Loans (please enter full numbers)</b>						
Total <b>number</b> of outstanding <b>loans</b>	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Total <b>number</b> of outstanding <b>loans to non-</b>	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Total <b>number</b> of <b>non-financial businesses</b> with an	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Total <b>number</b> outstanding <b>loans to individuals</b>	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Total <b>number</b> of <b>individuals</b> with an outstanding	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Total <b>value</b> of outstanding <b>loans</b>	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Total <b>value</b> of outstanding <b>loans to non-financial</b>	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Total <b>value</b> of outstanding <b>loans to individuals</b>	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
<b>Retail Locations</b>						
Total number of bank branches	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Number of bank branches in <b>urban</b> areas	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Number of bank branches in <b>rural</b> areas	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Banking Agents (Non-branch retail locations)	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
<b>Payments</b> - Please give system wide totals for the following:						
Total number of <b>debit/ATM cards</b> in circulation	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Total number of <b>ATM machines</b>	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Total number of <b>individuals</b> with a debit/ATM card	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Total number of <b>Point of Service terminals</b>	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Total number of <b>Point of Service transactions</b> in the	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
<b>Year for which you provided the data</b>	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
<b>Comments</b>	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

**Table 3: Sample table for classifying bank and non-bank institutions into 5 main categories.**

DEFINITIONS	1. For each category, provide the type of the institutions that you supervise/regulate	2. For each category, provide the type of the institutions that you do NOT supervise/regulate and indicate who does
<b>Commercial Banks</b>	[Commercial Banks, Universal Banks]	[n/a]
<b>Cooperatives, Credit Unions, &amp; Mutuels</b>	[Credit Unions]	[Urban and Rural Cooperatives, regulated by the Ministry of Cooperatives]
<b>Government Savings or Development Bank</b>	[Government Agricultural Development Bank]	[Postal Bank, regulated by Ministry of Commerce]
<b>Microfinance Institution</b>	[None]	[n/a]
<b>Other institutions providing loans and/or deposit services</b>	[Municipal Savings and Loan Institutions, Financing Companies (deposit taking)]	[n/a]

**Table 4: Supervisory arrangements for Banks and non-Banks**

<b>Supervisory arrangement</b>	<b>Commercial Banks</b>	<b>MOFIs</b>	<b>SSOFIs</b>	<b>MFIs</b>
Institutions in this category <u>only</u> supervised by commercial bank regulator	100.0%	41.5%	41.1%	34.6%
<u>Only some</u> institutions in this category supervised by bank regulator	0.0%	16.2%	7.0%	9.2%
Institutions in this category only supervised by <u>other</u> regulator	0.0%	16.9%	14.0%	7.7%
No supervising authority reported for Institutions in this category	0.0%	25.4%	38.0%	48.5%

Note: Frame is 129 respondents.

**Table 5: Data available on the number of deposits and loans is limited, especially for non-banks.**

<b>Data Available:</b>	<b>Commercial Banks</b>	<b>MOFIs</b>	<b>SSOFIs</b>	<b>MFIs</b>
Data on Value of Deposits	118	42	32	22
Data on Number of Deposit Accounts	83	24	20	17
Data on Value of Loans	116	42	33	28
Data on Number of Loans	63	18	15	18
Data on Number of Individual Depositors	30	8	6	10
Data on Number of Individual Borrowers	27	10	7	8

Note: The data counting the numbers of individual depositors likely reflects much double counting because most respondents reported not being able to track individuals across multiple institutions even if they could ask banks for their individual totals.

**Table 6: Summary Statistics**

This table presents summary statistics for our main indicators. All monetary values are expressed in 2008 US dollars. The exact definition of each variable is shown in Appendix 1.

	N	Mean	Std. Dev.	25%	Median	75%
<i>Commercial Banks</i>						
Accounts / Adult population	85	996	995	270	702	1,498
Av. Value of accounts <sup>1</sup> / GDP per capita <sup>2</sup>	72	2.6	5.6	0.4	0.9	2.4
Loans / Adult population	65	299	304	42	214	430
Branches / Adult population	119	16	15	5	12	23
Branches / Sq km	119	33	138	1	6	21
<i>Cooperatives<sup>3</sup></i>						
Accounts / Adult population	56	129	337	0	0.2	71
Av. Value of accounts <sup>1</sup> / GDP per capita <sup>2</sup>	27	0.7	1.3	0.2	0.3	0.5
Loans / Adult population	50	19	64	0	0	10
Branches / Adult population	69	5	11	0	0.3	2.8
Branches / Sq km	69	6	17	0	0.2	2.6
<i>Government Banks<sup>3</sup></i>						
Accounts / Adult population	68	91	271	0	0	10
Av. Value of accounts <sup>1</sup> / GDP per capita <sup>2</sup>	22	35	96.4	0.3	0.3	3.3
Loans / Adult population	62	8.8	27.3	0	0	0.1
Branches / Adult population	84	2.1	5.3	0	0	1.1
Branches / Sq km	84	3.2	9.9	0	0	0.4
<i>MFIs<sup>3</sup></i>						
Accounts / Adult population	70	9.3	28.2	0	0	0.3
Av. Value of accounts <sup>1</sup> / GDP per capita <sup>2</sup>	15	0.8	1.7	0.1	0.2	0.5
Loans / Adult population	70	7.9	18.5	0	0	1.8
Branches / Adult population	77	1.1	3.1	0	0	0.7
Branches / Sq km	77	1.6	8.7	0	0	0.2

1. The average value of accounts is calculated as the (Total Value of Deposit Accounts / Number of Accounts)
2. To facilitate comparisons, the statistics are for the sample of countries with available data on the number of accounts in commercial banks.
3. Includes countries where the cooperative sector (or government or microfinance sector, respectively) is not regulated / supervised by any financial regulator (In those cases, the corresponding figures are zeros).

**Table 7: Prediction models of the number of deposit accounts in commercial banks**

This table shows the estimates of OLS regressions of the number of deposit accounts in commercial banks per thousand adults on several covariates. Each column represents a different regression. The dependent variable in each regression is  $\ln(\text{Number of accounts in commercial banks}/1000 \text{ adults})$ .

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
$\ln(\text{GDP/capita})$	0.41** (0.16)	0.44*** (0.084)	0.63*** (0.18)	0.68*** (0.090)	0.83*** (0.069)
High Inc. OECD (dummy)	-0.59** (0.29)	-0.55* (0.28)	-0.67* (0.34)	-0.61* (0.33)	-0.62* (0.33)
$\ln(\text{Population Density})$	0.090 (0.062)	0.14** (0.053)	0.049 (0.073)	0.12* (0.064)	0.17*** (0.058)
$\ln(\text{Private Credit/GDP})$	0.18 (0.13)	0.17 (0.11)	0.33** (0.15)	0.35*** (0.13)	
$\ln(\text{Branches}/100\text{k Adults})$	0.53*** (0.10)	0.56*** (0.093)			
$\ln(\text{Value Deposits}/\text{Population})$	0.041 (0.12)		0.062 (0.14)		
Constant	1.48* (0.87)	1.21 (0.77)	1.11 (1.04)	0.84 (0.94)	-1.06* (0.60)
Observations	62	73	64	75	80
R-squared	0.824	0.824	0.738	0.733	0.708

Note: Standard errors in parentheses; \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$  In these regressions and subsequent predictions, we leave out countries with fewer than 100,000 adult populations and extreme outliers.

**Table 8: Data sources and models used in the estimation of the number of accounts in commercial banks**

This table shows the distribution of data sources and models used to estimate the number of accounts in commercial banks around the world. The third column represents the percentage in terms of countries. The last column represents the percentage in terms of accounts.

<b>Data Source</b>	<b># countries</b>	<b>% sample</b>	<b>% final count</b>
FA Survey '09 (Reported Data)	91	59%	48%
BTP '08; BDM '07, CGAP internal numbers*	25	16%	22%
Model 1 (branches volume)	17	11%	9%
Model 2 (branches)	2	1%	0%
Model 3 (volume)	6	4%	5%
Model 4 (with private credit)	7	5%	1%
Model 5 (without private credit)	6	4%	14%
<b>Totals</b>	<b>154</b>	<b>100%</b>	<b>100%</b>

\* BTP = Banking the Poor (2008); BDM = Beck, Demirgüç-Kunt, and Martinez-Peria (2007), CGAP numbers were gathered in email exchanges between other CGAP staff and national regulator staff.

**Table 9: Prediction model of the number of deposit accounts in mutually owned institutions**

This table shows the estimates of OLS regressions of the number of deposit accounts in mutually owned institutions (cooperatives, credit unions, and Mutualls) per thousand adults on several covariates. The dependent variable in each regression is  $\ln(\text{Number of accounts in mutually owned institutions}/1000 \text{ adults})$ .

$\ln(\text{GDP/capita})$	-0.93*** (0.20)
$\ln(\text{Value Deps./Population})$	0.97*** (0.11)
Constant	7.44*** (1.49)
Observations	22
R-squared	0.804

Note: Standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1



**Table 10: Data sources used in the estimation of the number of MOFI accounts**

This table shows the distribution of data sources used to estimate the number of accounts in mutually owned financial institutions (MOFI) around the world. The third column represents the percentage in terms of countries. The last column represents the percentage in terms of accounts.

<b>Data Source</b>	<b># countries</b>	<b>% sample</b>	<b>% final count</b>
FA Survey '09	56	35%	56%
WOCCU	52	33%	3%
Predictions	15	9%	6%
Set to 25th percentile	21	13%	2%
EACB	13	8%	13%
CGAP internal numbers	1	1%	20%
<b>Totals</b>	<b>158</b>	<b>100%</b>	<b>100%</b>

Notes: WOCCU is World Council of Credit Unions, ECBA is European Cooperative Banking Association, 25th percentile used only in "preferred estimate" 50th percentile used in "high estimate"; predictions based on regression, and CGAP internal numbers are for Japan and come from direct communication with regulator.

**Table 11: Data sources used in the estimation of the number of SSFI accounts**

This table shows the distribution of data sources used to estimate the number of accounts in SSFIs around the world. The third column represents the percentage in terms of countries. The last column represents the percentage in terms of accounts.

<b>Data Source</b>	<b># countries</b>	<b>% sample</b>	<b>% final count</b>
FA Survey '09	68	33%	78%
CGAP "Big Numbers" *	141	67%	22%
<b>Totals</b>	<b>209</b>	<b>100%</b>	<b>100%</b>

Notes: CGAP "Big Numbers" refers to data gathered for CCGAP, Occasional Paper no. 8, 2004

**Table 12: Data sources used in the estimation of the number of MFI accounts**

This table shows the distribution of data sources used to estimate the number of accounts in MFIs around the world. The third column represents the percentage in terms of countries. The last column represents the percentage in terms of accounts.

<b>Data Source</b>	<b># countries</b>	<b>% sample</b>	<b>% final count</b>
FA Survey '09	14	16%	44%
Microfinance Exchange (MIX)	75	84%	56%
Totals	89	100%	100%

Note: MIX numbers are values voluntarily reported by MFIs and aggregated to country level.

**Table 13: Estimates for numbers of accounts by income group and by category of providing institution.**

This table shows the estimation for the number of accounts by income group and category of providing institution. Countries are divided according to the World Bank income group definition. The last column represents the percentage of accounts in non-bank institutions (MOFIs + SSFIs + MFIs).

	<b>Commercial Banks</b>	<b>MOFI</b>	<b>SSFI</b>	<b>MFIs</b>	<b>Total</b>	<b>% Non-Bank</b>
<i>Panel A: World</i>						
Low Estimate	4.75 Bn	0.68 Bn	0.34 Bn	0.01 Bn	5.78 Bn	
Preferred Estimate	5.01 Bn	0.71 Bn	0.44 Bn	0.02 Bn	6.18 Bn	18.99%
High Estimate	5.27 Bn	0.82 Bn	n.a.	n.a.	6.55 Bn	
<i>Panel B: Middle income and developing countries</i>						
Low Estimate	2.05 Bn	0.16 Bn	0.34 Bn	0.01 Bn	2.56 Bn	
Preferred Estimate	2.22 Bn	0.19 Bn	0.41 Bn	0.02 Bn	2.84 Bn	21.76%
High Estimate	2.39 Bn	0.25 Bn	n.a.	n.a.	3.08 Bn	
<i>Panel C: High Income countries</i>						
Low Estimate	2.67 Bn	0.52 Bn	0.00 Bn	0.00 Bn	3.19 Bn	
Preferred Estimate	2.79 Bn	0.53 Bn	0.03 Bn	0.00 Bn	3.35 Bn	16.67%
High Estimate	2.91 Bn	0.57 Bn	n.a.	n.a.	3.51 Bn	

Note: Value per 1000 adults numbers have as base, population from all countries (including those which we have no estimate of bank accounts).

**Table 14: Reported rates of formal account ownership from household surveys and the logarithm of deposit penetration.**

This table shows the results of the OLS regressions of reported rates of formal account ownership from household surveys and the logarithm of deposit accounts per thousand adults. Column (1) is surveys taken after 2003, (2) are surveys after 2003 where the reported fraction is of all adults (rather than households) (3) is all available household surveys (going back to 2000).

	(1)	(2)	(3)
ln(Deposits./ 1000 Adults)	25.2*** (7.51)	24.5*** (5.73)	24.8*** (6.64)
Constant	-112.2*** (-4.95)	-105.4*** (-3.51)	-115.1*** (-4.65)
Observations	25	17	31
R-squared	0.7101	0.6861	0.6034
Note: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1			

**Table 15: Household survey sources, years and countries**

Some of these data points are not used in the calculation of the conversion factor because no reported or predicted values for account numbers were available.

Country	Survey Source	Year	Savings Account %	Base	Conversion factor (see note)
Austria	European Commission	2008	97	All Adults	R, PR, CB
Belgium	European Commission	2008	99	All Adults	R, PR, CB
	Claessens (2006) -				
Botswana	FINSCOPE	2003	47	Household	
Cyprus	European Commission	2008	82	All Adults	
Czech Republic	European Commission	2008	83	All Adults	R, PR, CB
Denmark	European Commission	2008	99	All Adults	PR
Estonia	European Commission	2008	84	All Adults	R, PR, CB
Finland	European Commission	2008	94	All Adults	PR
France	European Commission	2008	98	All Adults	PR
Germany	European Commission	2008	97	All Adults	PR
Greece	European Commission	2008	72	All Adults	R, PR, CB
Hungary	European Commission	2008	66	All Adults	PR, CB
India (UP and AP)	Claessens (2006) - RFAS	2003	47.5	Household	
Ireland	European Commission	2008	88	All Adults	PR
Italy	European Commission	2008	84	All Adults	R, PR, CB
Latvia	European Commission	2008	52	All Adults	R, PR, CB
	Claessens (2006) -				
Lesotho	FINSCOPE	2003	17	Household	
Lithuania	European Commission	2008	59	All Adults	R, PR, CB
Luxembourg	European Commission	2008	99	All Adults	PR
Malawi	FINSCOPE	2008	17	All Adults	PR, CB
Malta	European Commission	2008	79	All Adults	
	Claessens (2006) -				
Namibia	FINSCOPE	2003	28.4	Household	
Netherlands	European Commission	2008	99	All Adults	R, PR, CB
Nigeria	FINSCOPE	2008	13.9	All Adults	PR
Pakistan	FINSCOPE	2008	3	All Adults	R, PR, CB
Panama	Tejerina and Westley (2007)	2003	35.2	Household	
Poland	European Commission	2008	60	All Adults	R, PR, CB
Portugal	European Commission	2008	83	All Adults	PR
Rwanda	FINSCOPE	2008	14	All Adults	R, PR, CB
Slovakia	European Commission	2008	74	All Adults	PR
Slovenia	European Commission	2008	94	All Adults	R, PR, CB
	Claessens (2006) -				
South Africa	FINSCOPE	2004	46	Household	
Spain	European Commission	2008	92	All Adults	R, PR, CB
	Claessens (2006) -				
Swaziland	FINSCOPE	2003	35.3	Household	
Sweden	European Commission	2008	98	All Adults	PR
Uganda	FINSCOPE	2007	19	All Adults	R, PR, CB
UK	European Commission	2008	94	All Adults	PR

\*Note: R = used in "reported totals only" conversion factor calculation, RP = "reported and predicted" calculation, CB = "commercial banks only" calculation

**Table 16: Computation methods of the “conversion factor”**

This table shows the results of the so-called *conversion factor* using three different methodologies. The conversion factor is calculated, for each country for which household data are available, as the total number of deposit accounts divided by the number of individuals who have savings/deposit accounts in formal financial institutions. This factor is a proxy for the average number of accounts per account holder. Such proxy is not perfect, since the figure for the total number of accounts include not only individual accounts, but also business and government accounts. For *reported totals only*, the sample was restricted to countries with reported account data and household survey data. In the *reported and predicted* row, we use countries with household survey data and account data, regardless of whether it were reported or predicted data. Finally, in the last row, labeled *comm. bank accounts*, we use a sample of countries with household survey data and commercial bank reported account data. The columns present the mean, as well as the 90% confidence interval.

Conversion Factor Calculation Method	# Obs.	Conversion Factor	90% C.I.	
		Mean	-	+
Using reported totals only	15	3.0	2.0	3.9
Using reported and predicted	28	3.2	2.6	3.9
Using reported comm. bank accts.	17	2.5*	1.6	3.4

Notes: \*The conversion factor from reported commercial bank accounts is not necessarily comparable to the others since it will use generate the number of banked adults from the number of commercial bank accounts only.

**Table 17: Estimation of the number of banked people using the three different conversion factors**

This table shows the estimation of the banked population using three different methodologies to estimate the so-called conversion factor. The conversion factor is calculated, for each country for which household data are available, as the total number of deposit accounts divided by the number of individuals who have savings/deposit accounts in formal financial institutions. For *reported totals only*, the sample was restricted to countries with reported account data and household survey data. In the *reported and predicted* row, we use countries with household survey data and account data, regardless of whether it were reported or predicted data. Finally, in the last row, labeled *comm. bank accounts*, we use a sample of countries with household survey data and commercial bank reported account data.

Conversion Factor Calculation Method	Region	Estimate for Number Banked	% Adult Pop. Banked
Using reported totals only	World	1.78 Bn	38%
	High Income	0.70 Bn	81%
	Developing	1.08 Bn	28%
Using reported and predicted	World	1.91 Bn	41%
	High Income	0.74 Bn	86%
	Developing	1.17 Bn	31%
Using reported comm. bank accounts	World	1.71 Bn	37%
	High Income	0.65 Bn	75%
	Developing	1.06 Bn	28%

**Table 18: Prediction model for the number of loans per thousand adults**

This table shows the estimates of OLS regressions of the number of loans per thousand adults on a quadratic function of the natural logarithm of GDP per capita and the 2008 Credit Information Index of *Doing Business*. Our preferred specification is presented in column (1).

	(1)	(2)
ln(GDP per capita)	3.18*** (0.65)	
ln(GDP per capita) <sup>2</sup>	-0.14*** (0.04)	
ln(Value of Loans per 1000 adults)		2.31*** (0.29)
ln(Value of Loans per 1000 adults) <sup>2</sup>		--0.10*** (0.02)
Credit Information Index	0.09** (0.04)	0.07* (0.04)
Constant	-11.57*** (2.50)	-6.04*** (1.04)
Observations	69	58
Adjusted R-squared	0.817	0.867

Note: Standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 19: Cross-country correlations between measures of deposit account penetration, loan penetration, and demographic penetration of branches and country characteristics**

This table summarizes the pairwise correlations between measures of deposit account penetration, loan penetration, and demographic penetration of branches and different country characteristics. Each cell displays the pairwise correlation between the variable at the top of the column and the covariate in the corresponding row. The definition of each variable is shown in Appendix 1. \*\*\*= significant at the 1% level; \*\* = significant at the 5% level; \* = significant at the 10% level.

	Accounts per thousand adults in commercial banks (logs)	Loans per thousand adults in commercial banks (logs)	Branches per thousand adults in commercial banks (logs)	Branches per squared km in commercial banks (logs)
GDP per capita (log)	0.80***	0.86***	0.77***	0.53***
Population Density (log)	0.25**	-0.04	0.08	0.79***
Gini	-0.16	0.16	-0.25**	-0.45***
Inflation	-0.46***	-0.24**	-0.30***	-0.31***
Deposit Insurance	0.46***	0.51***	0.38***	0.30***
Electricity consumption	0.74***	0.80***	0.70***	0.44***
Phone lines	0.84***	0.85***	0.79***	0.59***
Road density	0.53***	0.42***	0.49***	0.82***
Absence of violence	0.49***	0.46***	0.53***	0.32***
Offshore	0.21**	0.20	0.18**	0.37***
Concentration	-0.28**	-0.35***	-0.18*	-0.23**
Government bank share	-0.18	-0.19	-0.21*	-0.11
Foreign bank share	-0.02	-0.03	-0.03	-0.04
KYC requirements	-0.18*	-0.05	-0.24***	-0.15*
Basic Accounts (Exc.)	-0.17	-0.03	-0.16	0.07
Basic Accounts (Req.)	0.11	0.13	0.18**	0.10
Documents required	-0.22	-0.05	-0.07	-0.28*
Min. Bal. Open checking	-0.44***	-0.41***	-0.46***	-0.33***
Checking annual fee	-0.50***	-0.44**	-0.58***	-0.41***
Tax incentives	0.28***	0.25**	0.25***	0.12
Operations agents (savings)	0.20*	0.20	0.11	0.11
Postal Network	0.35***	0.28**	0.29***	0.31***
Contract enforcement	-0.47***	-0.32***	-0.43***	-0.28***
Creditor Rights Index	0.37***	0.31**	0.25***	0.28***
Creditor Inf. Index	0.48***	0.60***	0.52***	0.32***
Places to submit loan	0.51***	0.63***	0.52***	0.25*
Minimum loan	-0.32**	-0.34*	-0.36**	-0.14
Fee consumer loan	-0.17	0.06	-0.02	-0.18
Days process loan	-0.27*	-0.24	-0.21	-0.06
Operations agents (credit)	0.17	0.22*	0.14	0.10
Branch approval	-0.08	-0.09	-0.28***	-0.08

**Table 20: Cross-country covariates associated with deposit account penetration**

This table summarizes the results of OLS regressions of the (logarithm of) number of accounts per thousand adults in commercial banks on different country characteristics. Each column in each panel represents the result of one regression. The definition of each variable is shown in Appendix 1. Robust standard errors are in parentheses. \*\*\*= significant at the 1% level; \*\* = significant at the 5% level; \* = significant at the 10% level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
GDP per capita (log)	0.68*** (0.06)	0.66*** (0.06)	0.75*** (0.08)	0.63*** (0.06)	0.62*** (0.06)	0.40*** (0.12)	0.21* (0.10)	0.69*** (0.11)	0.63*** (0.06)	0.66*** (0.06)	0.42*** (0.08)	0.39*** (0.09)
Population Density (log)		0.15* (0.08)	0.35*** (0.10)	0.14 (0.08)	0.16* (0.08)	0.13* (0.07)	0.13* (0.07)	0.16 (0.12)	0.15* (0.08)	0.14 (0.08)	0.14** (0.06)	-0.30* (0.15)
Gini			0.00 (0.01)									
Inflation				-0.02*** (0.01)								
Deposit Insurance					0.34** (0.16)							
Electricity consumption						0.25** (0.13)						
Phone lines							0.47*** (0.11)					
Road density								-0.06 (0.13)				
Absence of violence									0.09 (0.10)			
Offshore										0.20 (0.31)		
Branches per adult (log)											0.45*** (0.14)	
Branches per km <sup>2</sup> (log)												0.44*** (0.13)
Constant	0.90 (0.54)	0.37 (0.69)	-1.13 (1.34)	0.81 (0.71)	0.49 (0.66)	0.75 (0.75)	3.05*** (0.80)	0.29 (1.02)	0.63 (0.69)	0.44 (0.72)	1.33** (0.59)	3.78*** (1.08)
N	85	85	38	81	84	72	84	59	85	85	83	83
R <sup>2</sup>	0.64	0.67	0.67	0.70	0.68	0.64	0.75	0.71	0.67	0.67	0.72	0.72



**Table 20 (Cont): Cross-country covariates associated with deposit account penetration**

	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)
GDP per capita (log)	0.61*** (0.05)	0.58*** (0.07)	0.58*** (0.07)	0.66*** (0.07)	0.70*** (0.08)	0.66*** (0.06)	0.81*** (0.15)	0.59*** (0.06)	0.61*** (0.08)	0.68*** (0.07)	0.66*** (0.06)	0.64*** (0.07)
Population Density (log)	0.13* (0.08)	0.13** (0.06)	0.19*** (0.06)	0.15* (0.08)	0.09 (0.09)	0.15* (0.08)	0.19* (0.11)	0.15*** (0.05)	0.24*** (0.08)	0.15* (0.08)	0.15* (0.08)	0.13 (0.08)
Concentration	-0.63 (0.43)											
Government bank share		0.16 (0.35)										
Foreign bank share			0.19 (0.26)									
KYC requirements				-0.02 (0.04)								
Basic Accounts (Exc.)					0.18 (0.21)							
Basic Accounts (Req.)						0.12 (0.17)						
Documents required							-0.00 (0.13)					
Min. Bal. Open checking								0.00 (0.01)				
Checking annual fee									-0.01 (0.01)			
Tax incentives										-0.17 (0.16)		
Operations agents (savings)											0.09 (0.21)	
Postal Network												0.21 (0.17)
Constant	1.31* (0.69)	1.16* (0.61)	0.84 (0.62)	0.49 (0.83)	0.23 (0.85)	0.37* (0.69)	-0.92 (1.64)	0.97 (0.57)	0.47 (0.90)	0.24 (0.70)	0.40 (0.70)	0.53 (0.73)
N	82	56	56	85	66	85	32	51	36	85	85	85
R <sup>2</sup>	0.67	0.72	0.72	0.67	0.67	0.67	0.73	0.77	0.78	0.67	0.67	0.67

**Table 21: Cross-country covariates associated with the loan penetration**

This table summarizes the results of OLS regressions of the (logarithm of) number of loans per thousand adults in commercial banks on different country characteristics. Each column in each panel represents the result of one regression. The definition of each variable is shown in Appendix 1. Robust standard errors are in parentheses. \*\*\*= significant at the 1% level; \*\* = significant at the 5% level; \* = significant at the 10% level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
GDP per capita (log)	1.05*** (0.09)	1.05*** (0.09)	0.99*** (0.09)	1.04*** (0.09)	0.57** (0.21)	0.60*** (0.19)	1.01*** (0.13)	1.08*** (0.11)	1.04*** (0.10)	1.02*** (0.09)	0.93*** (0.10)	0.66*** (0.10)	0.97*** (0.11)
Pop. Density (log)		-0.05 (0.08)											
Gini			0.01 (0.01)										
Inflation				-0.01 (0.01)									
Elect. consumption					0.40* (0.22)								
Phone lines						0.46*** (0.17)							
Road density							0.06 (0.16)						
Contract enforcement								0.00 (0.00)					
Absence of violence									0.06 (0.16)				
Creditor Rights Index										0.07** (0.04)			
Creditor Inf. Index											0.14*** (0.05)		
Branches per adult (log)												0.66*** (0.13)	
Branches per km <sup>2</sup> (log)													0.10 (0.08)
Constant	-3.4*** (0.77)	-3.2*** (0.78)	-3.0*** (0.84)	-3.2*** (0.77)	-2.3** (0.91)	-0.7 (1.30)	-3.4*** (0.96)	-3.8*** (1.00)	-3.2*** (0.82)	-3.6*** (0.75)	-2.9*** (0.79)	-1.81** (0.71)	-2.53* (0.99)
N	65	65	33	64	53	64	42	65	65	65	65	64	64
R <sup>2</sup>	0.73	0.74	0.75	0.74	0.69	0.77	0.74	0.74	0.74	0.75	0.76	0.80	0.74

**Table 21 (Cont): Cross-country covariates associated with the loan penetration**

	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
GDP per capita (log)	1.00*** (0.08)	0.98*** (0.12)	0.93*** (0.13)	0.96*** (0.15)	0.92*** (0.15)	0.92*** (0.15)	0.92*** (0.14)	1.04*** (0.09)
Concentration	-1.40*** (0.46)							
Government bank share		0.03 (0.91)						
Foreign bank share			-0.28 (0.43)					
Places to submit loan				-0.05 (0.10)				
Minimum loan					0.00 (0.00)			
Fee consumer loan						-0.06 (0.09)		
Days process loan							0.01 (0.02)	
Operations agents (credit)								0.38 (0.39)
Constant	-2.1*** (0.72)	-2.7*** (1.01)	-2.1* (1.12)	-2.4*** (1.07)	-2.2* (1.25)	-2.1 (1.32)	-2.2* (1.15)	-3.4*** (0.76)
N	64	42	39	32	30	27	31	65
R <sup>2</sup>	0.76	0.73	0.74	0.76	0.75	0.73	0.76	0.74

**Table 22: Cross-country covariates associated with the demographic penetration of branches**

This table summarizes the results of OLS regressions of the (logarithm of) number of branches per thousand adults in commercial banks on different country characteristics. Each column in each panel represents the result of one regression. The definition of each variable is shown in Appendix 1. Robust standard errors are in parentheses. \*\*\*= significant at the 1% level; \*\* = significant at the 5% level; \* = significant at the 10% level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
GDP per capita (log)	0.51*** (0.03)	0.58*** (0.07)	0.50*** (0.04)	0.30*** (0.08)	0.22*** (0.07)	0.48*** (0.06)	0.48*** (0.03)	0.49*** (0.05)	0.49*** (0.03)	0.49*** (0.04)
Population Density (log)	0.02 (0.05)	0.06 (0.07)	0.01 (0.05)	0.02 (0.05)	-0.00 (0.05)	-0.04 (0.08)	0.02 (0.05)	0.02 (0.05)	0.01 (0.05)	0.02 (0.05)
Gini		-0.02* (0.01)								
Inflation			-0.01 (0.01)							
Electricity consumption				0.22** (0.09)						
Phone lines					0.34*** (0.07)					
Road density						0.13 (0.09)				
Contract enforcement							-0.00 (0.00)			
Absence of violence								0.04 (0.09)		
Concentration									-0.16 (0.40)	
Branch approval										-0.02 (0.16)
Constant	-2.0*** (0.41)	-1.6 (1.01)	-1.8*** (0.44)	-1.8*** (0.50)	-0.3 (0.53)	-2.0*** (0.56)	-1.7*** (0.47)	-1.9*** (0.49)	-1.7*** (0.57)	-1.8*** (0.46)
N	119	49	115	102	118	84	119	118	115	116
R <sup>2</sup>	0.59	0.56	0.60	0.54	0.66	0.68	0.60	0.60	0.58	0.57

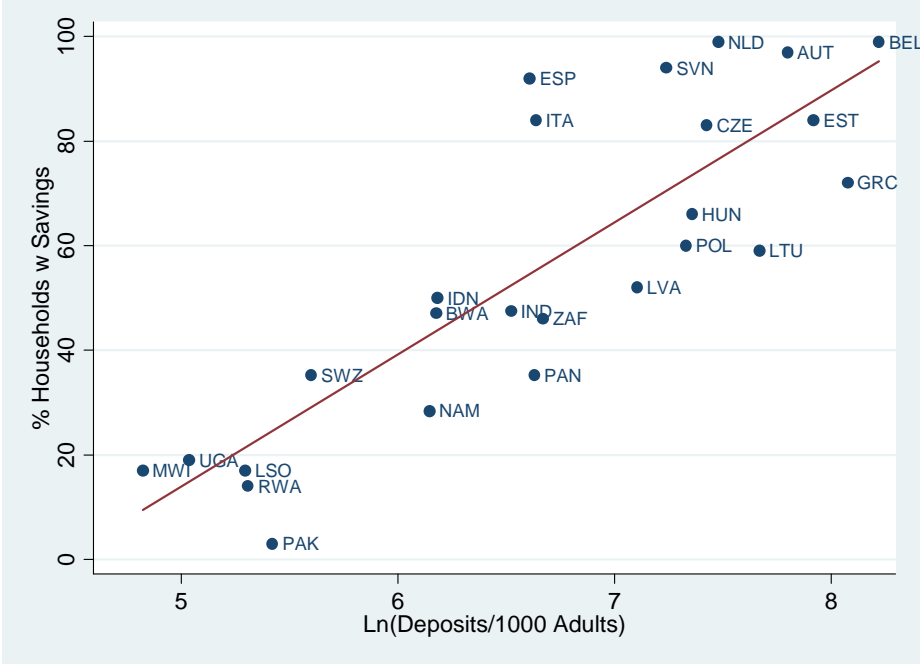
**Table 23: Cross-country covariates associated with the geographic penetration of branches**

This table summarizes the results of OLS regressions of the (logarithm of) number of branches per squared km in commercial banks on different country characteristics. Each column in each panel represents the result of one regression. The definition of each variable is shown in Appendix 1. Robust standard errors are in parentheses. \*\*\*= significant at the 1% level; \*\* = significant at the 5% level; \* = significant at the 10% level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
GDP per capita (log)	0.58*** (0.03)	0.67*** (0.08)	0.57*** (0.04)	0.31*** (0.09)	0.24*** (0.07)	0.54*** (0.06)	0.55*** (0.04)	0.56*** (0.05)	0.56*** (0.03)	0.56*** (0.04)
Population Density (log)	1.03*** (0.05)	1.06*** (0.07)	1.02*** (0.05)	1.03*** (0.06)	1.00*** (0.05)	0.95*** (0.08)	1.03*** (0.05)	1.03*** (0.05)	1.02*** (0.05)	1.02*** (0.05)
Gini		-0.02** (0.01)								
Inflation			-0.01 (0.01)							
Electricity consumption				0.28*** (0.10)						
Phone lines					0.41*** (0.07)					
Road density						0.16 (0.10)				
Contract enforcement							-0.00 (0.00)			
Absence of violence								0.04 (0.10)		
Concentration									-0.23 (0.40)	
Branch approval										-0.03 (0.17)
Constant	-7.6*** (0.44)	-7.0*** (1.10)	-7.4*** (0.48)	-7.4*** (0.52)	-5.6*** (0.55)	-7.5*** (0.60)	-7.2*** (0.50)	-7.5*** (0.52)	-7.2*** (0.59)	-7.4*** (0.49)
N	119	49	115	102	118	84	119	118	115	116
R <sup>2</sup>	0.86	0.77	0.86	0.86	0.89	0.87	0.86	0.87	0.86	0.86

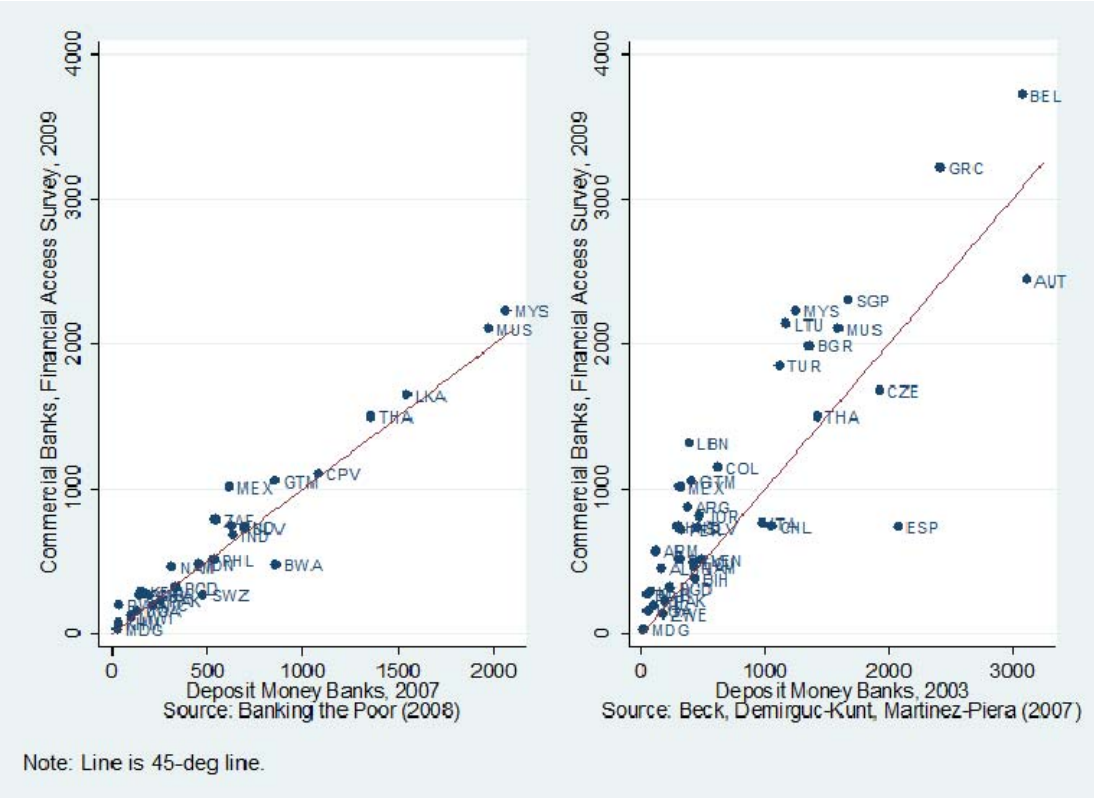
**Figure 1: Added variable plot from Model (1) in Table 8.**

This figure shows the line of best fit from Model (1) in Table 8, namely, the OLS regression between the rates of formal account ownership from household surveys and the logarithm of deposit accounts per thousand adults. The estimation only takes into accounts surveys taken after 2003.



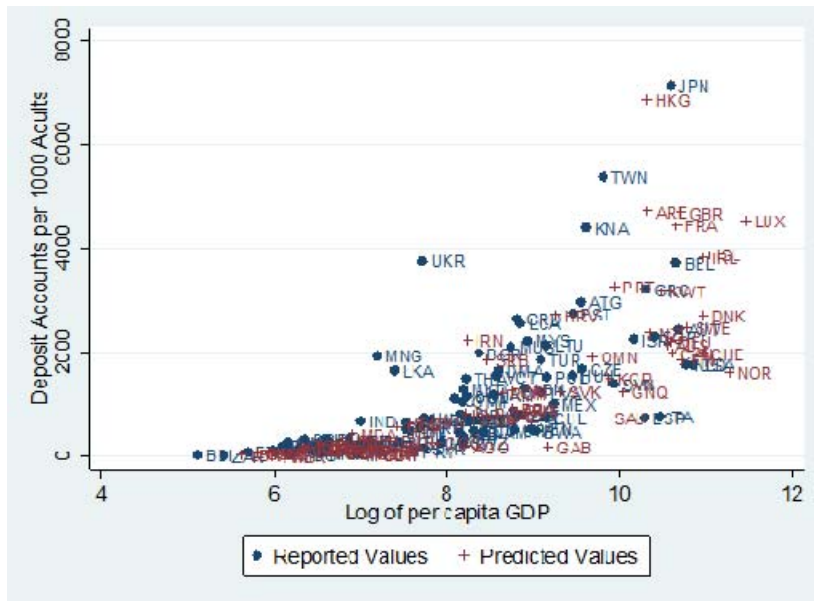
**Figure 2: Numbers of commercial bank accounts from Financial Access Survey against numbers of accounts in deposit money banks collected in 2008 and 2003**

This figure shows the correlation between the number of accounts per thousand adults collected in the Financial Access Survey and previous data. The left panel shows the correlation with the same figure as collected by the World Bank (2008). The right panel presents the correlation with the numbers collected by Beck, Demirgüç-Kunt and Martinez-Peria (2008). The line represents the OLS regression.



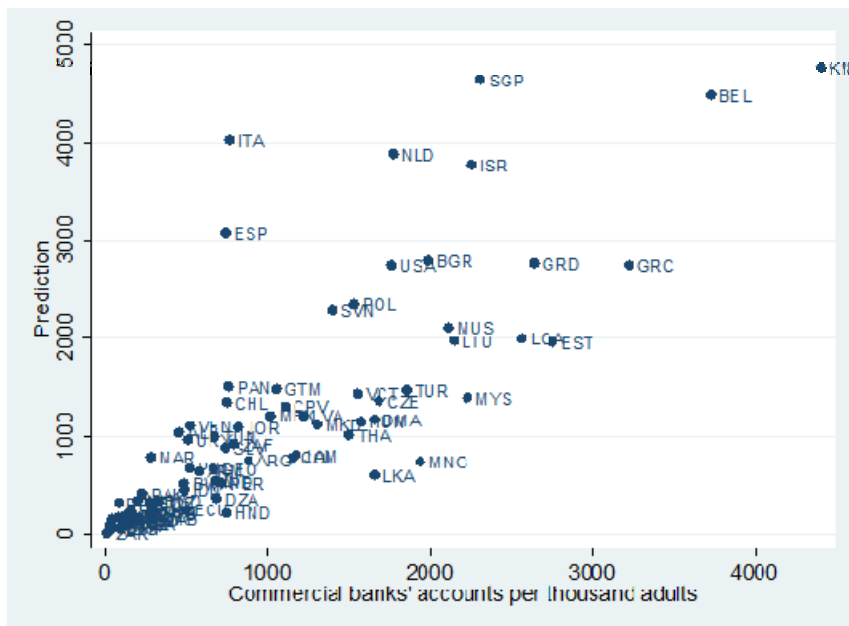
**Figure 3: Deposit penetration and income per capita (Actual and predicted values)**

This figure shows the actual and predicted values (Model 1) of accounts in commercial banks per thousand adults and income per capita. The blue dots represent the actual values. The red crosses represent the predicted values.



**Figure 4: Predicted and actual values using Model 1.**

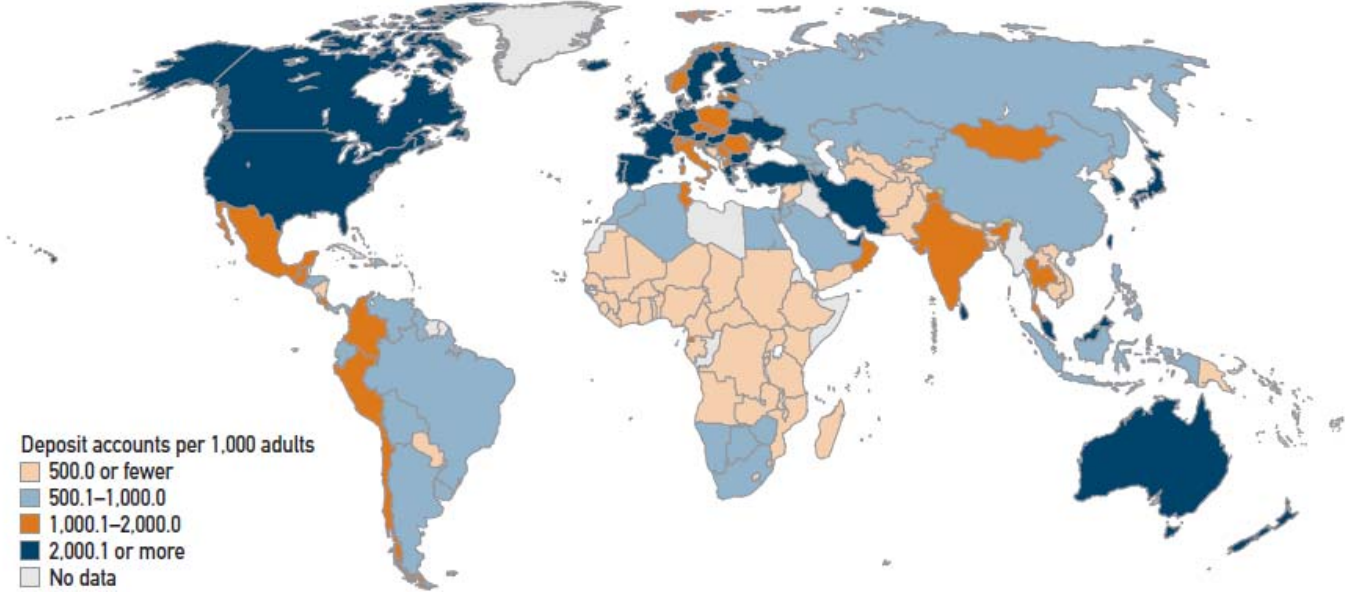
This figure shows the actual and predicted values (Model 1) of accounts in commercial banks per thousand adults. Spain and Italy are outliers due to their large cooperative sectors, which function as banks but are not counted in commercial bank data.





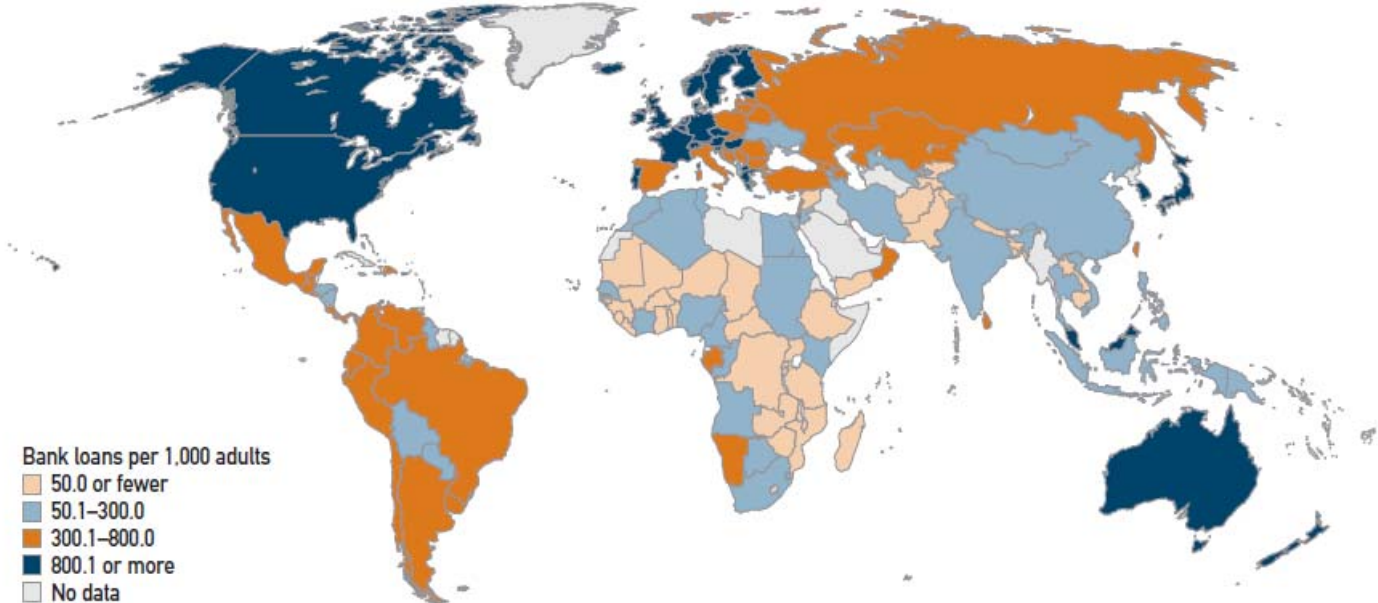
**Figure 5: Number of deposit accounts in banks and regulated non-bank financial institutions per thousand adults**

This figure shows the worldwide distribution of deposit accounts in banks and regulated non-bank financial institutions per thousand adults. Predicted values are used when data are not available.



**Figure 6: Number of bank loans per thousand adults in commercial banks**

This figure shows the worldwide distribution of deposit accounts in banks and regulated non-bank financial institutions per thousand adults. Predicted values are used when data are not available.



## Appendix 1: Variables

Variable	Description	Source
GDP per capita	Gross Domestic Product per capita in current dollars of 2007	World Development Indicators
Population Density	Total number of people in 2008 divided by the area of land measured in km <sup>2</sup>	World Development Indicators
Adult Population	Adult population in 2008. When the 2008 data are not available, we use the most recent	World Development Indicators
Population	Total population in 2008. When the 2008 data are not available, we use the most recent	World Development Indicators
Branches per adult	Number of branches per 100,000 adults	<i>Financial Access Database</i> (2009)
Branches per sq km	Number of branches per squared km	<i>Financial Access Database</i> (2009)
Credit Information Index	Scored on zero to six scale; scores increasing with scope, access, and quality of credit information	World Bank <i>Doing Business</i> Indicators, 2009
Gini	Gini coefficient for income inequality in each country (5-year average 2003-2007)	World Development Indicators
Inflation	10 year average (1998-2008) of the change in the CPI in each country	International Financial Statistics
Deposit Insurance	Equals one if the country had an explicit deposit insurance in 2003 and zero otherwise.	Demirgüç-Kunt., Karacaovali, and Laeven (2005)
Electricity Consumption	Watts-hour consumption per capita in 2006	World Development Indicators
Phone Lines	Total telephone mainlines per thousand people (5-year average 2003-2007)	World Development Indicators
Road Density	Kilometers of roads per 100 km <sup>2</sup> of land area (5-year average 2003-2007)	World Development Indicators
Absence of Violence	Sub-Index of Political Stability / No Violence, 2008	World Bank Governance Indicators
Offshore	Equals one if the country was defined by the IMF as an offshore center in 2008	IMF
Concentration	Share of deposits in the five largest banks	Barth, Caprio, and Levine (2004)
Government Bank Share	Percentage of banking system assets in banks 50% + owned by government	Barth, Caprio, and Levine (2004)
Foreign Bank Share	Percentage of banking system assets in banks 50% + owned by foreign entities	Barth, Caprio, and Levine (2004)
KYC Requirements	An index aggregating the documentation required to open a checking account. This includes: (1) Government issued ID, (2) Any ID, (3) Proof of nationality or legal status, (4) Proof of address, (5) Proof of income, (6) Proof of employment, and (7) Other	<i>Financial Access Database</i> (2009)
Basic Accounts (Exc.)	Equals one if there were regulatory exceptions for low income people in 2008 to the documentation requirements for opening a bank checking account	<i>Financial Access Database</i> (2009)
Basic Accounts (Req.)	Equals one if there are, among the policies to promote access to finance, regulatory requirements for banks to offer a basic or low fee account.	<i>Financial Access Database</i> (2009)
Documents Required	The average number of documents (in the 5 largest banks) required to open a checking account in 2008.	World Bank, <i>Banking the Poor</i> (2008)
Min. Bal. open checking	Minimum balance required to open a checking account expressed as a percent of GDP. It combines two databases. When data were available in both data sets, the variable takes the latest value.	Beck, Demirgüç-Kunt., and Martinez-Peria (2008) and World Bank, <i>Banking the Poor</i> (2008)

## Appendix 1 (Cont): Variables

Variable	Description	Source
Checking annual fee	Fees associated with maintaining a checking account expressed as percent of GDP per capita in 2004	Beck, Demirgüç-Kunt., and Martinez-Peria (2008)
Tax incentives	Equals one if a country claims that it has pursued tax incentive savings schemes (such as tax incentives for retirement, education, or medical savings) to promote financial access and zero otherwise.	<i>Financial Access Database</i> (2009)
Operations agents (savings)	This index is an equally weighted mean of responses to the following survey questions: (1) Agents are allowed to receive and forward applications to open accounts; (2) Agents are allowed to open accounts on behalf of the bank; (3) Agents to accept funds for deposit in the client's bank account and; (4) Agents to pay withdrawals from client's bank account.	<i>Financial Access Database</i> (2009)
Postal Network	Equals one if financial services are offered in the post offices and these services are handled by a separate private operator (typically a bank) and zero otherwise.	<i>Financial Access Database</i> (2009)
Contract Enforcement	Total enforcement cost, including legal fees, assessment and court fees expressed as percentage of total debt in 2008	World Bank <i>Doing Business</i> Indicators, 2008
Creditor Rights Index	Index of creditor rights following La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998)	World Bank <i>Doing Business</i> Indicators, 2008
Minimum loan	Lowest amount of consumer loan banks make expressed as a percent of GDP per capita in 2004	Beck, Demirgüç-Kunt., and Martinez-Peria (2008)
Fee consumer loan	Fee banks charge on consumer loans expressed as percent of GDP per capita in 2004	Beck, Demirgüç-Kunt., and Martinez-Peria (2008)
Days process loan	Number of days banks take to process a typical consumer loan application in 2004	Beck, Demirgüç-Kunt., and Martinez-Peria (2008)
Operations agents (credit)	This index is an equally weighted mean of responses to the following survey questions: (1) Agents to receive and forward loan requests to the bank; (2) Agents to conduct credit evaluations and to approve loans on behalf of the bank; (3) Agents to collect loan payments on behalf of the bank.	<i>Financial Access Database</i> (2009)
Branch Approval	Equals one if the Supervisor/Regulator approval is required to open each bank branch and zero otherwise in 2008.	<i>Financial Access Database</i> (2009)