

Financial Inclusion – measuring progress and progress in measuring

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Abstract: This paper documents and discusses recent advances in measuring financial inclusion and takes stock of the literature on the impact of financial inclusion on individual and aggregate welfare. Theory and empirical evidence has shown that financial deepening (more than financial inclusion) has a critical impact on structural transformation and poverty alleviation in developing countries. Among different financial services, expanding access to payment services seems to provide the biggest and most immediate impact on individual welfare. Financial innovation, including new delivery channels, new products and new intermediaries, have helped increase financial inclusion dramatically in some countries over the past decade, but also has repercussions for how we measure financial inclusion. The recent progress in measuring and tracking financial inclusion has been important for policy analysis and the setting of targets. However, caution is advised in over-interpreting headline indicators.

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1. Introduction

Financial inclusion has increasingly moved to the top of the policy agenda in many developing countries, reflected in several G20 statements (most recently in 2016 in Hangzhou), establishment of financial inclusion units in Central Bank and Ministries of Finance and specific financial inclusion targets. One important aspect of formulating policy goals, however, is the ability to measure progress in achieving these goals. Over the past decade, enormous progress has been made in measuring financial inclusion across the globe. At the same time, being able to measure financial inclusion has allowed us to gauge the progress due to financial innovation and policy interventions. Critically, as more evidence becomes available on what dimensions and aspects of financial inclusion are important for individual welfare and firm growth, data collection can be and has been adjusted accordingly. This paper takes stock both of the progress in measuring financial inclusion as well as the literature on the impact of financial inclusion on individual and aggregate welfare.

Financial inclusion refers to the access by enterprises and households to reasonably priced and appropriate formal financial services that meet their needs. Access to financial services can be defined along several dimensions, including geographic access (i.e. proximity to a financial service provider) and socio-economic access (i.e. absence of prohibitive fees and documentation requirements). Appropriate design of products that meet the needs of clients, are sustainable for both providers and users, but do not involve abusive pricing, are other important aspects.¹ Financial inclusion is a broader concept than microfinance, which often refers to the provision of products to specific groups at the lower end of the market, using specific delivery techniques and institutions.

Financial inclusion is part of a broader financial deepening agenda that focuses on ensuring the efficient and sustainable provision of financial services to households, enterprises and governments, while minimizing the risk of fragility. While an extensive literature has established a positive relationship between financial depth (as measured by aggregate measures such as Private Credit to GDP) and economic growth that holds even when controlling for estimation biases arising from reverse causation, measurement and omitted variables (see Levine, 2005 and Beck, 2009, for surveys), evidence on a positive impact of

¹ See, for example, CGAP (2011), which defines financial inclusion as a “state in which all working age adults have effective access to credit, savings, payments and insurance from formal service providers” and defines effective access as “convenient and responsible service delivery, at a cost affordable to the customer and sustainable for the provider...”

financial inclusion on individual and aggregate welfare has been much less conclusive. One important lesson learned in this literature is to differentiate between different types of services. It is also important to understand that the development and efficiency of financial systems can have an impact not only on aggregate growth, but also on tightening income distribution and helping people out of poverty, even without providing them with direct access to credit services.

Financial inclusion has become an important part of the development agenda that aims at reducing poverty levels further. It is therefore critical to understand what works and what does not work in financial inclusion. This is important for both formulating policy priorities and allocating scarce government and donor resources. Properly measuring financial inclusion and the barriers to it and relating them to real sector outcomes is therefore a priority for research. In this context it is important to stress that financial inclusion is not an objective in itself, but only to the extent that it helps improve individual and aggregate welfare.

While ten years ago, data on financial inclusion were scarce and limited to country-specific survey evidence, the past decade has seen substantial progress in this area.² Financial depth indicators have been complemented with cross-country data on branch, ATM and account penetration. More importantly, two waves of the Global Findex surveys have provided very detailed insights not only in the share of population with a bank account but also the use of different financial services. These data also allow detailed analysis of variation in financial inclusion across different groups within the population.

Financial inclusion targets have become increasingly popular over the past years, including the Universal Financial Access Goal, as formulated by the World Bank Group in 2013, that *“by 2020, adults, who currently aren't part of the formal financial system, have access to a transaction account to store money, send and receive payments as the basic building block to manage their financial lives.”* As much as the recent progress in measuring financial inclusion helps formulate and monitor progress in achieving these targets, setting such targets has also helped provide impetus for additional attempts at measurement. However, while measuring financial inclusion and thus tracking progress is important for policy formulation and implementation, it is important to keep in mind Goodhart’s law that *“when a measure becomes a target, it ceases to be a good measure.”* It becomes open to political interference

² October 2004 saw a first high-level gathering at the World Bank to discuss data needs to better measure financial inclusion, in the context of the Year of Microcredit 2005. World Bank (2006 a, b) are some of the early technical pieces outlining what was available at that point in time and requirements for data collection.

(or at least interpretation) if not manipulation. In this context the question on a proper benchmarking arises, i.e., whether we can expect the same level and progress in financial inclusion in different types of countries, and whether we care so much about account ownership rather than use of formal financial services.

This paper documents the progress that the global community has made on measuring financial inclusion over the past decade and – using these data – the progress in financial inclusion itself. I will also discuss the important role of financial innovation in the increasing financial inclusion, especially the role of technology. One important aspect I will stress that over all the attention put on financial inclusion one should not ignore the critical role that financial deepening per se, i.e. more efficient financial intermediaries and markets have on structural transformation of economies and, ultimately, on poverty alleviation.

This paper focuses primarily on the measurement of financial inclusion while at the same time discussing the role of financial inclusion goals in the broader financial development agenda. It should not be seen as a comprehensive literature survey on access to finance (see Karlan and Morduch, 2010, Beck, 2015, World Bank, 2014, among others).

The remainder of the paper is structured as follows. Section 2 discusses the relationship between financial development and poverty alleviation and the role of financial inclusion in this relationship, relating both to theory and empirical findings. Section 3 presents the progress the global community has made in measuring financial inclusion. Section 4 discusses the role of financial innovation in financial inclusion. Section 5 discusses the importance of a proper benchmark when comparing financial inclusion rates across countries and over time. Section 6 focuses on the role of gender in the financial inclusion debate. Section 7 concludes and looks forward.

2. Finance and the Poor – two different concepts

As discussed above, financial inclusion is part of a broader financial development agenda, which also includes the development of efficient financial intermediaries and markets to support economic growth. In this section, I will make an important distinction between two different channels through which – in theory - financial development can reduce poverty levels across the globe and discuss empirical evidence for both channels.

Individuals can benefit directly from gaining access to specific financial services. First, more efficient payment systems can help individuals by allowing better integration into modern

market economies. Not having to rely on cash, but rather using safer, less costly and swifter means of transferring payments allows more economic transactions across greater geographic distances. This can have a direct impact on income earning opportunities and thus incomes of the poor. Second and related to the intermediation function of the financial system, gaining better access to savings and credit services enables the poor to pull themselves out of poverty by investing in human capital accumulation, thus reducing aggregate poverty (Galor and Zeira, 1993). Similarly, gaining access to credit services allows the poor to invest in their micro-enterprises, again gaining broader income earning opportunities and ultimately higher incomes (Banerjee and Newman, 1993). Interestingly, a similar argument has been made for access to savings services; by protecting resources from intra-family claims through formal savings accounts, micro-entrepreneurs can invest more in their businesses (Dupas and Robinson, 2013). Third, access to efficient savings, credit and insurance services allows the poor to smoothen consumption when hit with income or expenditure shocks (Jappelli and Pagano, 1989; Bacchetta and Gerlach, 1997; Ludvigson, 1999). The most obvious example is the need to keep children at home for work purposes rather to send them to school; being able to access efficient savings, credit and insurance services to smooth income or expenditure shocks reduces the need to do so (Beegle, Dehejia and Gatti, 2007). Financial inclusion, i.e., expanding access to financial services to previously unbanked population segments, which are typically poorer and live in more remote areas, can thus help pull these people out of poverty. By better using human resources in an economy, there is also an aggregate positive effect on economic growth.

The evidence on the effects of financial inclusion on poverty alleviation has been mixed and varies across different financial services. For credit, there seems no clear-cut case for access to credit having long-term and transformational positive repercussions, at least on average, though with some evidence that a certain share of the targeted micro-entrepreneurial population can benefit quite a lot. As summarized by Banerjee, Karlan and Zinman (2015) in their introductory paper on a special issue of the AEJ: Applied Economics, there is “a consistent pattern of modestly positive, but not transformative, effects.” There are several reasons for this limited impact (Banerjee, 2013). First, micro-entrepreneurs might not be credit constrained and/or other constraints within the business environment might be more binding, which might also explain the limited take-up of microcredit. Second, there might be rapidly diminishing returns, in the form of an S-shaped production and micro-enterprises’ capacity to grow might thus be limited. In this context, one also has to distinguish between

life-style or subsistence entrepreneurs and transformational entrepreneurs. Many of the micro-enterprises are set up out of lack of alternative employment options for the owner in the formal sector and rely almost exclusively on the owner, maybe with support from family members and/or friends.³ This indicates that a large share of microenterprise owners may be running their business to make a living while they are looking for a wage job and may not have plans for expanding the business (Emran, Morshed and Stiglitz, 2007). The lack of finding indications of transformative effects of microfinance in field studies is matched with aggregate results that show very small if any positive effect on aggregate growth, though some effects on redistribution (Buera, Kaboski and Shin, 2013; Kaboski and Townsend, 2011, 2012).⁴

Studies assessing the impact of providing access to savings products are, on average, more positive than the literature on the impact of microcredit. However, they also show the need for very specific products and techniques to overcome constraints of low-income households and micro-entrepreneurs (Karlan, Ratan and Zinman, 2014). Specifically, geographic barriers, high costs in terms of opening balances and fees, documentation requirements, behavioral constraints in the form of present-bias and intra-household conflicts, and the lack of financial knowledge are important constraints to expand the use of formal savings products by low-income households. An expanding literature has explored different forms of subsidies, novel delivery channels and the use of commitment devices and nudges to overcome such constraints.

Given the evidence so far (which is just emerging), the strongest case can be made for expanding payment services on a large scale to previously unbanked segments of the population in developing countries. Several studies show that the use of more effective payment methods cannot only reduce costs and connect more people to national and international payment systems, but also allow more effective inter-personal exchange and risk sharing across space and over time (e.g. Blumenstock, Eagle and Fafchamps, 2013; Jack and Suri, 2014). Access to more efficient payment services can also expand access to non-bank external funding, such as trade credit, by reducing uncertainty of repayment (Beck et

³ For example, Hsie and Klenow (2009) show that 90% of all enterprises in India never grow. De Mel, McKenzie, and Woodruff (2010) show that only 30 percent of microenterprise owners in Sri Lanka have characteristics like large firm owners, whereas 70 percent are similar to wage workers. Bruhn (2013) finds that about 50 percent of a sample of Mexican micro-entrepreneurs are similar to wage workers.

⁴ There is an additional concern in terms of credit inclusion related to stability and the risk of overindebtedness of households and enterprises. See Beck (2015) for a longer discussion on this.

al., 2016b). Finally, expanding payment services also provide relatively easy and immediate gains, as the example of several African countries with mobile money accounts has shown.

Beyond financial inclusion, more efficient financial intermediaries and markets can also have an impact on poverty alleviation through effects on labor and good markets. Through structural transformation of the economy and allowing more entry into the labor market by previously unemployed or underemployed segments of the population, financial deepening (more efficient financial institutions and markets) can help reduce income inequality and poverty. By doing so, financial deepening can help achieve more inclusive growth and also help overcome spatial inequality in growth benefits. It is thus important to understand that the effects of financial deepening on employment and poverty alleviation do not necessarily come through the “democratization of credit” but rather a more effective credit allocation within the economy.

Recent empirical evidence has confirmed the importance of this channel. Gine and Townsend (2004) compare the evolution of growth and inequality in a dynamic general equilibrium model with the actual development in the Thai economy and show that financial liberalization and the consequent increase in access to credit services can explain the fast GDP per capita growth, rapid poverty reduction and initially increasing but then decreasing income inequality. Underlying these developments are occupational shifts from the subsistence sector into the intermediated sector and accompanying changes in wages. Net welfare benefits of increased access are found to be substantial, and, though they are concentrated disproportionately on a small group of talented, low wealth individuals who without credit could not become entrepreneurs, there are also benefits to a wider class of workers because eventually wage rates increase as a result of the enhanced access to credit by potential entrepreneurs. Beck, Levine and Levkov (2010) find similar evidence for the U.S., where branch deregulation in the 1970s and 1980s resulted in lower income inequality. Credit expansion following deregulation led to an increase in labor demand, which fell disproportionately on unskilled, lower-income households whose wage rates and working hours increased. These labor market reactions to financial liberalization can thus explain the tightening in income inequality. Ayyagari, Beck and Hoseini (2013) find a strong negative relationship between financial deepening, rather than financial inclusion, and rural poverty, following financial liberalization in 1991 in India. They also find that financial deepening reduced poverty rates among the self-employed, and also supported an inter-state migration from rural areas into the tertiary sector in urban areas.

In summary, there are two channels through which financial deepening can reduce poverty levels – through improving direct access to finance and, indirectly, through structural transformation. Empirical evidence on the first channel is most robust for savings and payments services and less so for credit services. Evidence on the second channel point to important effects on the labor market as mechanism through which financial deepening can reduce poverty. In terms of policy implications for the financial inclusion agenda it is important to look beyond credit to other financial services that are needed by the poor, such as simple transaction or savings services. While it should be a goal to achieve access to basic transaction and savings services for as large a share of the population as possible to thus enable them to participate in the modern market economy and help smooth their consumption, the agenda in boosting access to credit should focus on improving the efficiency of this process, replacing access through political connection and wealth as it still happens in many developing countries with access through competition. By channeling society's resources to the most credit-worthy enterprises and project, the financial system can enhance inclusive growth.

3. Measuring financial inclusion – from proxies to granular data

An extensive and still growing literature has related financial depth (proxied by money stock indicators, such as M2/GDP, or intermediation measures, such as Private Credit to GDP) to an array of real sector outcomes, most prominently GDP per capita growth, productivity growth but also international trade patterns (Levine, 2005). From early on it was understood that these indicators of financial development are very crude proxies for an underlying concept of financial development. High levels of Private Credit to GDP are associated with financial systems that offer a variety of products, at different maturities, including long maturities, at reasonable costs to a large share of the firm and household population. However, indicators such as Private Credit to GDP are clearly focused on the overall volume of financial intermediation in an economy and not on the distribution of services. Until ten years ago, no systematic data collection exercise focused on such data, neither on the country nor global level. The recent decade has seen progress in collecting data from regulators, suppliers and users of financial services. While the initial distinction was between access to and use of financial services, more recently attention has turned to extensive vs. intensive margins, i.e., pure account ownership versus intensity of use.

3.1. Aggregate indicators of financial inclusion

The International Year of Microcredit 2005 put the emphasis on the lack of data on financial inclusion. First attempts at the World Bank in collecting proxy indicators of financial inclusion included measures such as total branches and ATMs as well as the total number of loan and deposit accounts (Beck, Demirguc-Kunt and Martinez Peria, 2007), normalized by population, thus capturing the access dimension to financial services (branches and ATMs) and usage. While Honohan (2006) and World Bank (2007) show a non-linear relationship between these measures financial inclusion measures from household surveys for a small number of countries (and undertaken very differently), it is noisy one, which might be hard to use for out-of-sample predictions.⁵ This data collection effort has in the meantime been mainstreamed in the form of Financial Access Survey (FAS) at the IMF, with data available for more than 10 years for a broad cross-section of countries. This global data collection exercise has obviously also triggered data collection exercises on the national level, mostly at central banks, across the globe.

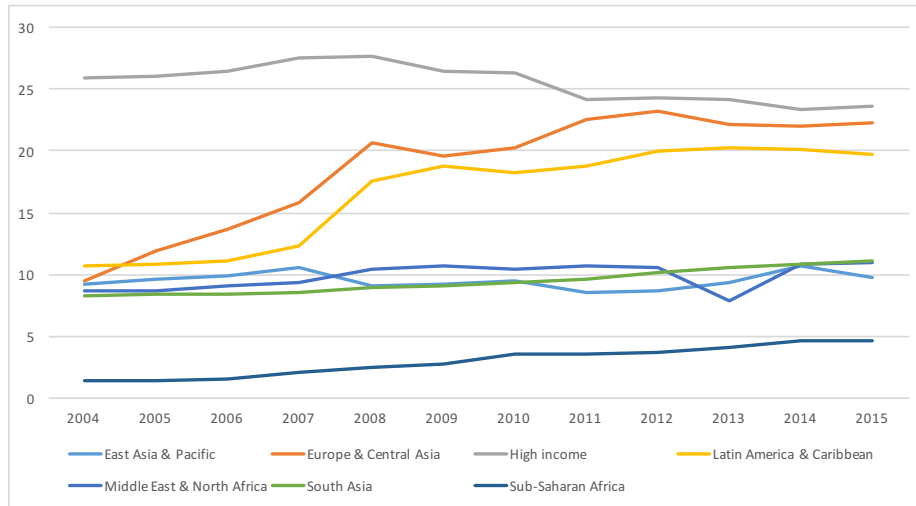
While using such aggregate indicators of financial inclusion constitutes a major step forward, there are measurement problems with such indicators. In the case of branch and ATM penetration, there is too strong a focus on (i) traditional delivery channels, ignoring innovative channels, including agency or correspondent banking and digital finance, (ii) a focus on geographic access, ignoring other barriers to access., and (iii) on regulated entities. While this can be addressed in the form of adjusting definitions, this might in turn pose problems of cross-country comparability as well as comparability over time. In the case of deposit and loan account per capita measures, these indicators do not take into account that individuals might have several accounts across different banks. It might also be very difficult to differentiate across different groups of account owners, such as men and women or income groups. One big advantage that should be mentioned is the high frequency, timeliness and limited costs with which such data can be collected, especially compared to survey-based gauges of financial inclusion discussed below.

Looking at these aggregate indicators over time shows a clear increase in branch penetration in the median country in Latin America, Central and Eastern Europe and Sub-Saharan Africa,

⁵ Similarly, Beck, Demirguc-Kunt and Martinez Peria (2007) showed correlation with firm-level access indicators.

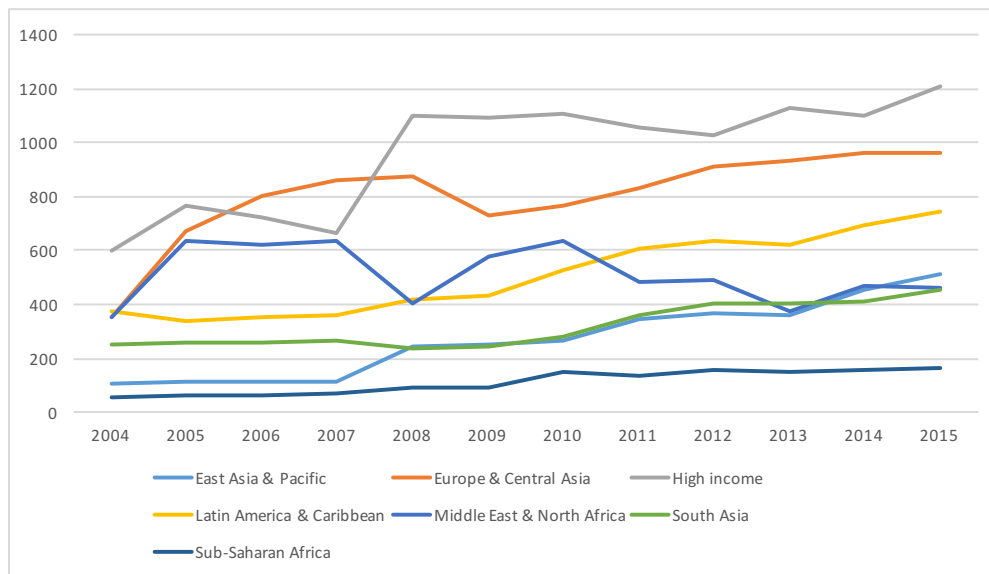
and little changes in the median country in South Asia, East Asia and Pacific and Middle East and North Africa (Figure 1). Notably, the median branch penetration in high income countries has declined since 2008, possibly as consequence of the Global Financial Crisis.

Figure 1: Branch penetration over time and across regions



Source: Financial Access Survey, IMF and calculation by author. The graph shows the median in branches of commercial banks per 100,000 adults across the six World Bank regions and the group of high-income countries.

Figure 2: Deposit account penetration over time and across regions



Source: Financial Access Survey, IMF and calculation by author. The graph shows the median in deposit accounts of commercial banks per 1,000 adults across the six World Bank regions and the group of high-income countries.

Considering the median for deposit account penetration over time across the different regions shows an increase in most though not all regions (Figure 2). Notably, the median country in

the Middle East and North Africa region has seen quite some variation over time in deposit account penetration. It is important to stress, however, that data for deposit account penetration are available for fewer countries than branch penetration data and variation over time might therefore be driven by outliers in some of the smaller regions.

A related, but separate data collection exercise has been going on to gauge the size and effect of barriers, such as costs of opening and maintaining accounts and documentation requirements. Such data has to be collected directly from banks across countries. Specifically, Beck, Demirguc-Kunt and Martinez Peria (2008a) report on such a collection exercise that targeted the largest 5 banks across a sample of 80 countries and present indicators for three types of banking services - deposit, loan and payments - across three dimensions – physical access, affordability and eligibility. Barriers such as availability of locations to open accounts and make loan applications, minimum account and loan balances, account fees, fees associated with payments, number of documents required to open a bank account, and processing times for loans vary significantly both across banks and countries. Such barriers can be very constraining for consumers, as the following back-of-the-envelope calculation shows. Assuming, somewhat arbitrarily, that poor people cannot afford to spend more than 2 percent of their annual income on financial services,⁶ just the fees on checking accounts can exclude more than 80 percent of the population in some African countries such as Uganda, Kenya and Malawi from having a bank account. In a follow-up survey, Beck, Demirguc-Kunt and Martinez Peria (2008b, 2011) focus on bank-level barriers and lending techniques for SME finance across banks and countries.

Data collection efforts on access barriers based on bank-level surveys face several implementation constraints. First, unless channeled through regulatory entities, there is the risk of low response rates. Second, the comparability of such data might be limited given different account types and fee structures across banks and countries. There have been several attempts at similar data collection exercises; however, with limited success. In general, this approach seems more adequate to undertake on the country-level, managed or supported by a regulatory entity and reducing problems of comparability.

In summary, these supply-side data collection efforts have provided critical insights into the

⁶ The 2 percent limit is based on unpublished research by the South African Universal Services Agency in the context of a mandated rolling-out of telecommunications service to lower-income families. As both financial transaction accounts and telecom service can be considered network products, similar assumptions on affordability for both services seems reasonable.

high variation in access to and use of financial services across countries. However, they have given a rather blurred picture of the ultimate metric we are interested in: the share of population in a country that uses different types of financial services.

3.2. Survey-based indicators of financial inclusion

Given the nature of financial inclusion focusing on individuals having access to and use financial services, more accurate measures of financial inclusion have to focus on users of financial services, in the form of surveys. While household surveys have a long tradition in development economics, including the LSMS used to measure poverty levels, they rarely included questions on access to or use of financial services. Early surveys focused on financial access by individuals are the Finscope and Finaccess surveys across several African countries, with similar stand-alone financial access surveys in several Latin American countries. What these surveys and datasets provided in depth for individual countries, they often missed in cross-country consistency.⁷ Based on the information on the use of different types of financial services, these surveys can be the base for “access strands”, which measure people’s financial inclusion status according to the most formal form of service that they use, including formal prudential (such as banks), formal non-prudential (such as mobile money providers or postal savings banks), formal registered (such as SACCOs or MFIs) and informal service providers.

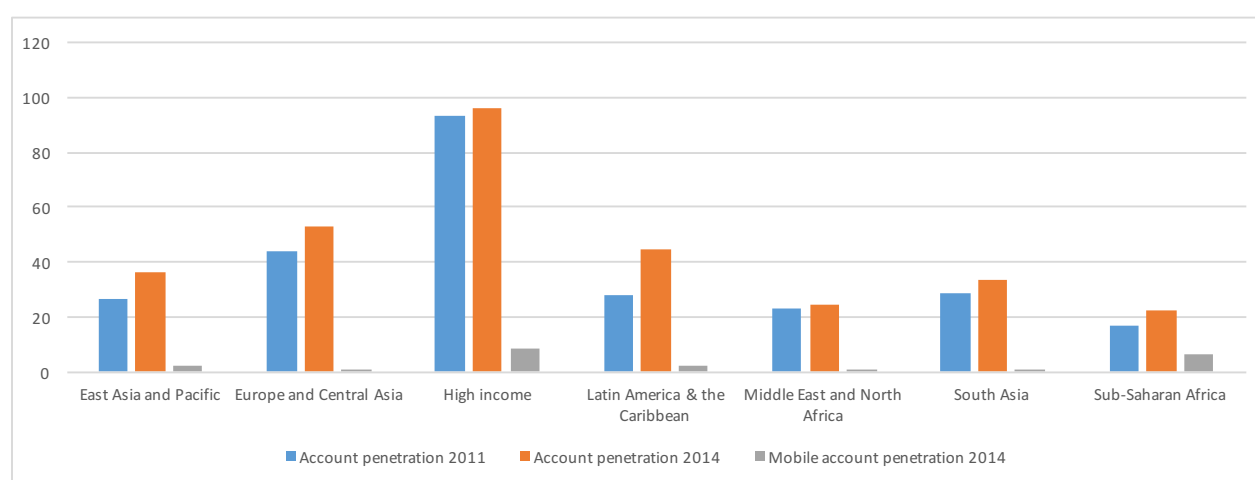
The World Bank, with support from the Bill and Melinda Gates Foundation, has undertaken over the past years a broad cross-country exercise – Global Financial Inclusion Survey - by including financial questions in an existing Gallup global poll to generate baseline data on financial inclusion levels across 150 countries, using samples of 1,000 persons per country. The survey is to be undertaken every three years to measure and track specific data on people’s use and access to formal and informal financial services; the first wave was conducted in 2011, the second wave in 2014, with a third wave planned for 2017. Experience with data from the first wave and the ongoing discussion on financial inclusion has led to adjustments and expansion in the questions for the second wave.

Figure 3 shows the share of adults with a bank account in 2011 and 2014 as well as mobile money account penetration in 2014 across different regions in the world. It documents a significant increase in the share of households with a bank account, between 2011 and 2014.

⁷ Honohan and King (2012) discuss differences in survey design and variables across countries.

This graph shows the median value across the six regions of the developing world (as classified by the World Bank) and the high-income country group. There has been a general increase in financial inclusion, as measured by this variable across most regions, with the notable exception of the Middle East and North Africa region. The increase in Latin America has been especially notable. The one dimension where Sub-Saharan Africa stands out is the share of population with a mobile-phone based account (only data for 2014 are available), where the median is significantly higher than in other regions except for high-income countries.

Figure 3: Account penetration across regions

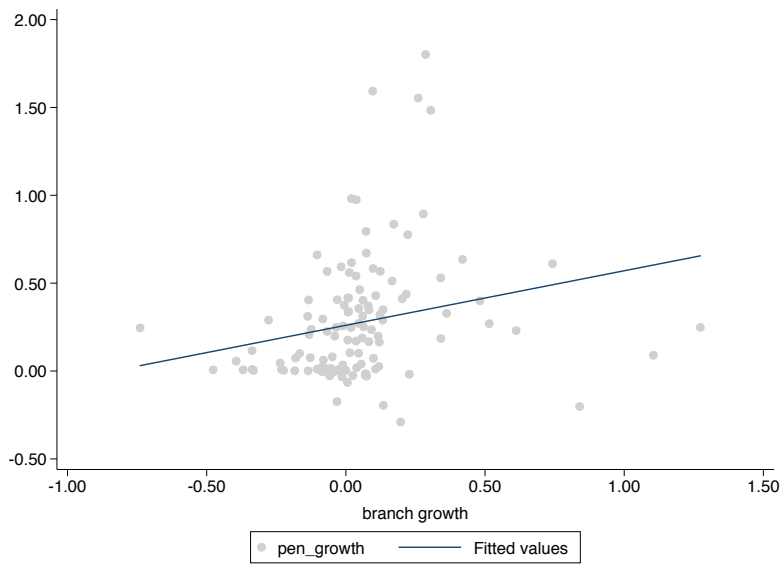


Source: Global Findex Survey, World Banks and calculation by author. The graph shows the median in account penetration across the six World Bank regions and the group of high-income countries.

While Figure 3 shows the overall share of population that has an account, the Global Findex data also allows digging deeper into the distribution of formal financial usage across geographical units, income strata, educational groups, and gender. It thus allows to answer the questions of where the underserved or excluded are located, in geographic and socio-economic terms and thus identify policy priorities.

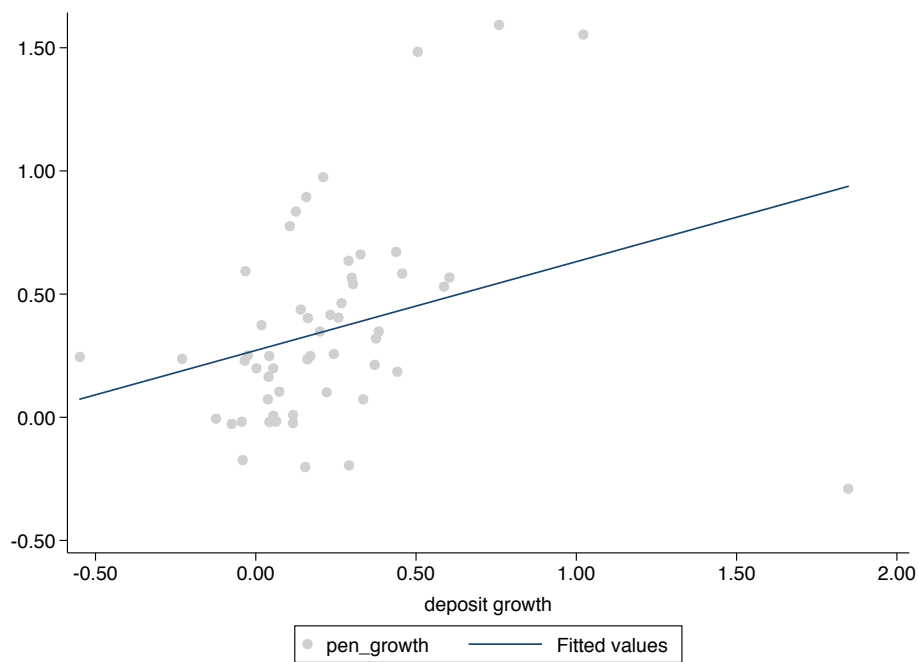
As such surveys are only available every 3 years, the question arises whether more frequently data such as branch or account penetration data can be used to extrapolate trends on an annual basis. Figure 4 (Figure 5) compare the log change in the share of adults with a bank account and the percentage change in branches per capita (deposit accounts per capita) between 2011 and 2014. In both cases, there is a positive but very noisy relationship.

Figure 4: Branch penetration vs. account penetration



Source: Financial Access Survey, IMF, Global Findex, World Bank and calculation by author. The graph shows log changes in a country's branch penetration between 2011 and 2014 and log changes in account penetration between 2011 and 2014.

Figure 5: Deposits per capita vs. account penetration



Source: Financial Access Survey, IMF, Global Findex, World Bank and calculation by author. The graph shows log changes in a country's deposit account penetration between 2011 and 2014 and log changes in account penetration between 2011 and 2014.

One important methodological question is whether the survey should try to capture access to financial services by the household or by individuals within the household. Cull and Scott (2010) use a randomized experiment in Ghana to test whether the identity of the respondent affect reported rates of use of financial services. Rates of household use are almost identical whether the head reports on behalf of the household or whether the rate is tabulated from a full enumeration of household members. A less complete summary of household use of financial services results, however, when a randomly selected informant and non-head of household provides the information. In short, who is asked the questions and how the questions are asked both matter for capturing the degree of financial inclusion of a household.

While the original focus of the financial inclusion debate has been on having an account, more recently the attention has shifted more towards the actual use of such accounts. While it might be easy to open an account, there might be limited use. Anecdotal evidence suggests a large share of dormant accounts, which were used to undertake one or two transactions and then never used again. This brings me back to an important observation: we do not care about financial inclusion per se, but only as it enables financially included to participate better in modern market economies. It also reinforces the early point that one has to look beyond headline indicators used to define and measure financial inclusion target. Even if an almost complete financial inclusion is achieved along the dimension of account ownership, this does not imply a de facto financial inclusion of similar extent.

The Global Findex survey also includes questions on the reason for not having an account, which allows to identify barriers from the user side (similar to barriers on the supply side mentioned above) and well as voluntary versus involuntary exclusion. While lack of need or indirect access through family members are quantitatively important factors, costs, geographic distance and lack of necessary documentation are also stated as important. Finally, trust in financial institutions poses a major concern in some economies, possibly related to socio-cultural barriers or recent banking crises and bank failures.

A very different but also important data source are the financial diaries (Collins et al., 2009). These field studies documenting the financial life of poor households over longer time periods have shown that the poor use an array of informal financial services and access an array of informal providers of financial services, including money lenders, deposit collectors, stores providing credit, pawnshops, and friends and family. One important insight from these diaries is that that poor households see credit and savings as substitutes, where the former has a large pay-out at the beginning of the contract, while the latter has the payout at the end, and

focus more on the cash flow (Collins et al., 2009). While not providing headline indicators, financial diaries can provide important input into the formulation of broader financial inclusion surveys and identify critical barriers to inclusion.

3.3.Measuring firm access to finance

The literature on firms' access to financial services has somewhat preceded progress in the literature on households' access to finance, although for many years the focus was mostly on large listed companies, given data constraints. While not the focus of this paper, I would like to mention recent progress in measuring access to finance by enterprises. Based on the World Business Environment Survey (WBES) in 1999/2000 across 80 developed and developing countries, the World Bank has undertaken the Enterprise Surveys across more than 100 countries. The most consistent effort has been in the Central and Eastern Europe and Central Asia region, where data have been collected every three to four years across all countries, including a panel dimension for a subset of firms (i.e., the same firms being surveyed every three or four years). Such a panel dimension is now also being introduced in other regions of the world.

While the initial use of these enterprise surveys has mostly used information on the actual use of a loan or credit line or self-reported financing constraints, more recent versions also allow distinguishing between demand and supply factors in the use of external finance.

Specifically, in addition to asking whether a firm has applied and been approved for a loan over the past year, a question is asked on the reasons if a firm has not applied for a loan. One of the options – no demand – allows to differentiate between the lack of demand as reason for not having a loan or credit line or supply side constraints. More importantly, one can distinguish between rejected and discouraged borrowers, where the latter would include firms that answered the question on the reasons for not applying with: *“Interest rates are not favorable”*; *“Collateral requirements are too high”*; *“Size of loan and maturity are insufficient”*; or *“Did not think it would be approved”*.⁸

⁸ Among the papers that have distinguished between the demand and supply-side factors, using a Heckman model, are Popov and Udell (2012) and Beck et al. (2016a). In the context of both papers that gauge differences in access to finance between the boom and bust period in Central and Eastern Europe (2005 and 2008/9, respectively), this distinction is important. An analysis of enterprise surveys shows that between 2005 and 2008, the share of firms with no demand for a loan or credit line increased from 30 to 38%. At the same time, the share of rejected or discouraged firms increased from 34% to 40%. Not distinguishing between supply and demand factors would thus overestimate the effect of any structural change.

It is important, however, not to overestimate the degree to which such survey data allow to differentiate between pure demand and bankable demand. One distinction that can be made is using the response “*Interest rates are not favorable*” to above question as indication that the expected return on the investment project for which financing was rejected was too low.

One of the less ideal elements is that there is no distinction between full and partial satisfaction of loan demand. The Survey on Access to Finance by Enterprises conducted by the ECB includes a question on this distinguishing between full and partial fulfillment of financing needs.⁹

One important methodological challenge relates to the representativeness of the sample of surveyed firms. It is important to not underestimate the challenges for getting a representative picture, where survey companies often have to rely on rather unreliable company registers.

As already mentioned, a still growing literature has explored enterprise survey data over the past 20 years to gauge the relationship between access to finance and firm investment and growth (e.g., Beck, Demirguc-Kunt and Maksimovic, 2005), bank competition and market structure and firms’ access to finance (Beck, Demirguc-Kunt and Maksimovic, 2004; Clarke, Cull and Martinez-Peria, 2006; Love and Martinez Peria, 2015) but also contagion of financial crisis (Popov and Udell, 2012) and the effect of different lending techniques (Beck et al., 2016a).

As an alternative to survey data, one can use financial statement data. However, these provide much less insights into the obstacles encountered by enterprises, as they only report the equilibrium outcome (even if constrained equilibrium) of demand and supply. Recently, such data has also become available for non-listed private firms, across many countries (e.g., Orbis database). While these databases do not allow to link individual firms to specific banks, credit registry data allow to do so, which allows the testing of very rich and detailed hypotheses such as differentiating between different clienteles of banks (Mian, 2005) and the use of different lending techniques by different types of banks (Beck, Ioannidou and Schaefer, 2017). On the other hand, credit registries only include actual borrowers (or sometimes also applicants as in the case of Spain), but not discouraged enterprises.

As households, firms in developing countries, especially smaller firms, rely on an array of informal non-bank financing sources, including own resources, those of family and friends,

⁹ For more detail, see here: <https://www.ecb.europa.eu/stats/money/surveys/sme/html/index.en.html>

but also trade credit and informal providers (Beck, Demirguc-Kunt and Maksimovic, 2008). Trade credit is often seen as a substitute for bank credit (Fisman and Love, 2003), with some trickling down effect from larger firms with access to bank credit to smaller firms with no such access, with the important exception of post-crisis periods (Love, Preve, Saria-Allende, 2007). While young and small enterprises in developed economies, especially in the U.S. often rely on personal credit (including credit card debt) for funding, much less is known about financing of young entrepreneurs in developing countries.

4. Benchmarking financial inclusion

Tracking indicators of financial inclusion over time is an important starting point. However, it does not allow us to necessarily attribute this broadening process to specific interventions or policy changes. Financial inclusion, as captured by these indicators, can change over time for many reasons unrelated to interventions and policies, including due to demand factors or changing technology. A more proper way to track financial inclusion is therefore to compare the development relative to peer countries. Researchers and practitioners alike generally rely on one-dimensional comparators, typically differentiating by stage of economic development or considering neighboring countries. While such restricted comparisons make sense on account of obvious similarities by country group, they fail to account for the fact that, as shown below in more detail, many other factors explain cross-country, cross-time variation in financial inclusion. Moreover, they fail to exploit the broader similarities between financial systems across the world that provide a richer basis for cross-country comparisons.

Following Beck et al. (2008), Barajas et al. (2013) and Beck and Feijen (2013), I would therefore like to suggest an alternative synthetic benchmark that compares a country in a given year to a benchmark derived from multi-dimensional cross-country comparisons.

This benchmarking exercise is related to the concept of the access possibilities frontier, as introduced by Beck and de la Torre (2007). This frontier can be seen as rationed equilibrium of potential supply and demand, variously affected by market frictions, including the fixed cost component of financial service provision and the risk of providing financial services, especially lending and insurance services, due to information frictions and limitations in perfectly diversifying idiosyncratic risks. This access possibilities frontier is determined by state variables, such as (i) structural characteristics of the socio-economic environment in which financial institutions and markets operate and which impose a limit on their

development and (ii) long-term policy variables that either foster or limit financial deepening. Points below the frontier point to policy restrictions that prevent a country from achieving the constrained maximum while a very low frontier points to fundamental deficiencies in the macro-economic and institutional framework. Points above the frontier point to an unsustainable overshooting, either due to subsidies or a credit boom that might end in systemic bank fragility.

In the following, I will focus on structural characteristics and define the structural depth line as the level of financial development predicted by structural country characteristics that are not directly related to policies and/or the financial sector. The gap between the actual level of financial development and the structural depth line can then be related to different policies and institutions. The analysis is based on the following simple regression model:

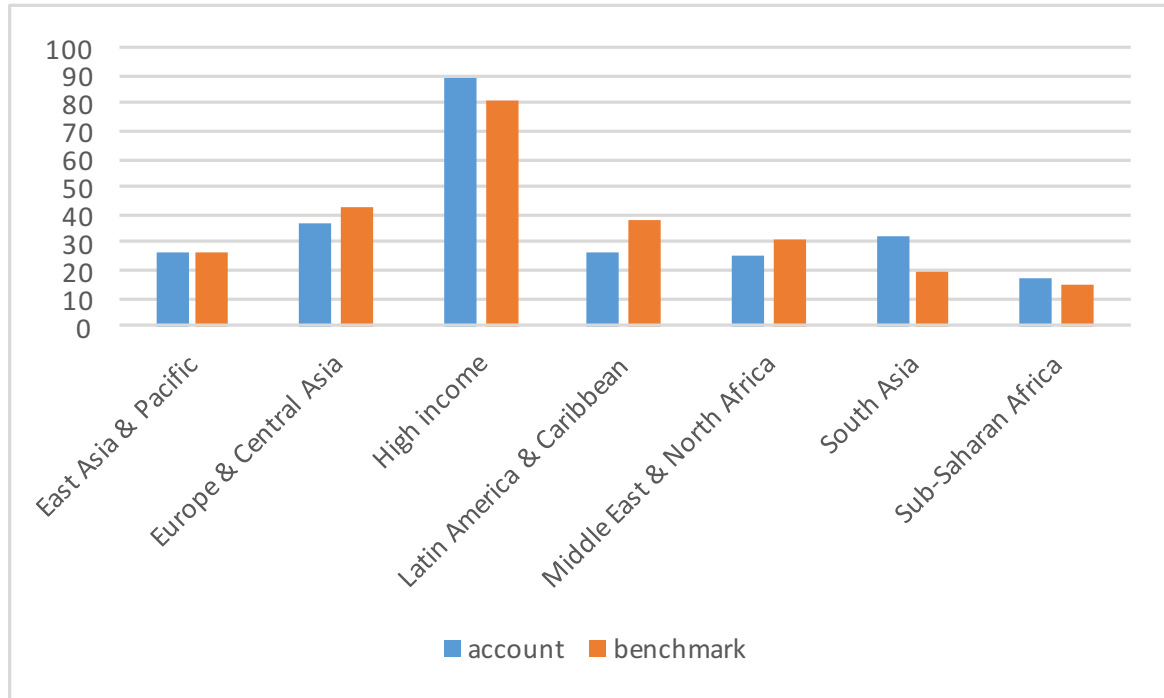
$$FD_{i,t} = \beta X_{i,t} + \varepsilon_{i,t} \quad (1)$$

where FD is the log of an indicator of financial development, X is an array of structural country-specific factors, and the subscripts i and t relate to countries and years, respectively. The regression includes several country characteristics that theory predicts to be associated with the level of financial development in a country: (i) the log of GDP per capita and its square (to account for possible non-linearities) proxy for general demand and supply-side constraints related to low income; (ii) the log of population proxies for market size, in line with the above discussion on scale economies; (iii) the log of population density proxies for geographic barriers and thus the ease of financial service provision; (iv) the log of the age dependency ratio is included to capture demographic trends and corresponding savings behaviour; and (v) dummy variables for off-shore centers, transition countries and fuel-exporting countries are included to control for specific country circumstances, as these countries face specific challenges and development experiences that impact their financial systems.

Figures 6 and 7 shows the actual and predicted value for account penetration in 2011 and 2014, respectively, for the median country across different regions. As can be seen, the median country in the high-income group, in South Asia and even in Sub-Saharan Africa had a higher account penetration in 2011 than predicted by the benchmark model, with the median country in East Asia and Pacific being at the expected level and the median country in the other three regions having an account penetration below the expected value. The

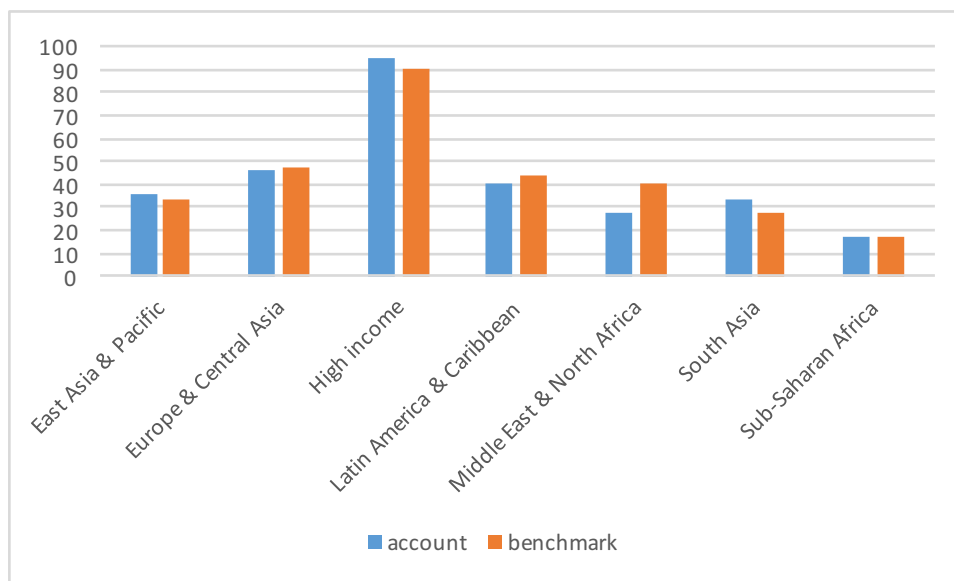
situation in 2014 is somewhat similar, though the gaps between actual and predicted value for the median country in each region are smaller.

Figure 6: Actual and predicted account penetration across regions in 2011



Source: Global Findex and FinStats, World Bank, and calculation by author. The graph shows the median in account penetration and the predicted median across the six World Bank regions and the group of high-income countries for 2011.

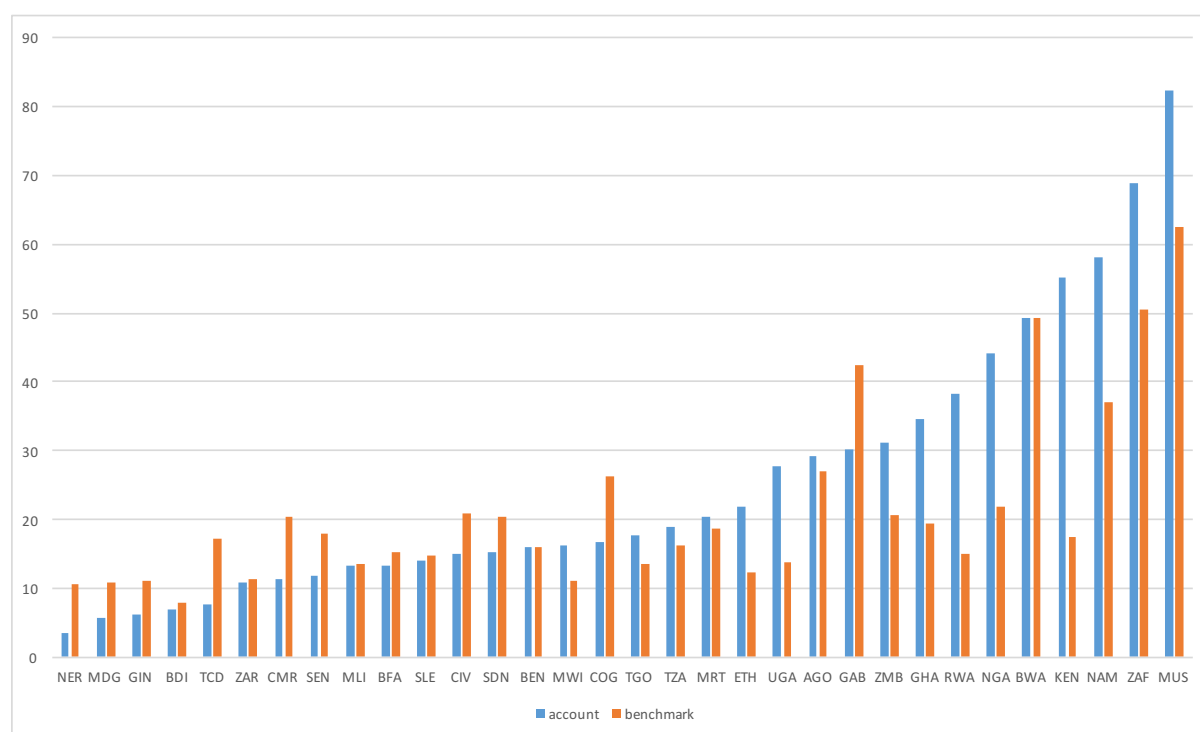
Figure 7: Actual and predicted account penetration across regions in 2014



Source: Global Findex and FinStats, World Bank, and calculation by author. The graph shows the median in account penetration and the predicted median across the six World Bank regions and the group of high-income countries for 2014.

Very obviously, behind these medians is a large variation across countries within regions. Figure 8 shows the actual and predicted value for account penetration across African countries in 2014. The four countries with highest level of account penetration are well above their respective benchmarks (especially Kenya, most likely due to M-Pesa), while Botswana, the fifth one has a level of account penetration as predicted by the benchmarking model. Most but not all countries with lower levels of account penetration are predicted to have higher levels according to their structural characteristics. Mauritania, Tanzania and Togo have relatively higher actual values than predicted, possibly due to their low population density, which reduces predicted account penetration.¹⁰

Figure 8: Actual and predicted account penetration across countries in Africa in 2014



Source: Global Findex and FinStats, World Bank, and calculation by author. The graph shows the median in account penetration and the predicted median across Sub-Saharan African countries for 2014.

This benchmarking model is not a perfect one and depends on the number of countries and the variables included in the model. But it provides the important message that any financial inclusion headline indicator has to be interpreted in context. In the context of the above examples, the gap between actual and predicted value can be used to identify policies and institutions that either explain why the actual level of financial inclusion is higher than the

¹⁰ Allen et al. (2014) show that branch penetration is more closely linked to population density in Africa than in other regions.

predicted or vice versa. It allows a first step towards defining a policy and institutional reform agenda for increasing financial inclusion.

5. The role of financial innovation

As discussed above, transactions costs and risk are two major market frictions that have prevented traditional financial intermediaries, including banks, to reach out to customers characterized by (i) the need for small and infrequent transactions because of low and volatile income and (ii) high risk profile due to lack of formal identification, address and work place. As discussed in section 3, this results in bank fees excluding a large share of population across many low- and lower-middle-income countries and documentation requirements being too burdensome for large parts of populations in developing economies. Similarly, high risks of entrepreneurs working in the informal and/or rural economy results in credit rationing a la Stiglitz and Weiss (1981) rather than attracting higher interest rates.

On a positive note, the financial system across the globe has critically changed over the past decade in the way it has reached out to lower market segments and the previously unbanked population. This is driven mainly by financial innovations helping to reduce costs and manage risks more effectively. Some of these “innovations” rely on business models applied by the cooperative movement in Continental Europe in the 19th century, including the use of joint liability, peer pressure and social collateral, as applied by many microfinance institutions across the globe (Ghatak and Guinane, 1999).

One important change has been the move away from the branch model to agency banking (in Latin America sometimes also referred to as correspondent banking) to lower the fixed costs of financial service provision. Brazil is a striking example for the promise of expanding the footprint of banks beyond brick-and-mortar branches subject to high, partly regulation-induced, costs. In 2000, almost 40% of municipalities did not have a bank outlet. In 1999, the Central Bank allowed banks to use non-banking establishment to provide basic financial services. By 2007, there were 8,000 bank correspondents, four times as many as branches, and – more importantly-, only 207 out of 5507 municipalities did not have any bank outlet (Assuncao, 2013). However, the agency model is not necessarily only about geographic distance but can also help overcome social distance by attracting clientele who do not feel comfortable entering a bank branch. Moving away from the brick-and-mortar branch model to an outsourcing model also has to come with changes in customer identification. There

have been two opposing trends over the past 15 years: on the one hand, there has been a push towards more identification in the context of AML-CFT. On the other hand, as such an approach would exclude large parts of the currently unbanked population who have limited documentation as already discussed above and/or would undermine the agency model, a more risk-based approach has been proposed that excludes customers with account sizes and transactions below a certain threshold.

An even more revolutionary trend has been towards digital finance, i.e., access to basic payment or even savings services through mobile phones, possibly even without having to have a bank account. The most prominent example has been M-Pesa in Kenya, but several other countries have followed suit, with different models and varying success. Bourreau and Valletti (2015) distinguish between five different models, ranging from the MNO-led model, with minimal cooperation with, such as M-Pesa in Kenya and Tigo Pesa in Tanzania over the bank-led model, with minimal cooperation with MNOs, such as the mobile payments services offered by Stanbic IBTC Bank in Nigeria, and different degrees of integrated models with cooperation between banks, MNOs and possibly other players. In general, the MNO-led model has led to a dramatic expansion in account penetration in countries like Kenya and Tanzania.

There are also financial innovations in credit and insurance services, including the use of psychometric assessments as a viable low-cost, automated screening tool to identify high-potential entrepreneurs and agricultural insurance based on objective rainfall data. The former allows for the use of additional data beyond scarce hard data, while the latter overcomes the cost inefficiency of individual insurance incident verification. In the area of small business lending, reverse factoring is promising where small enterprises can discount invoices for larger enterprises, thus effectively financing themselves based on their larger buyers' reputation than their own (Klapper, 2006).

Beyond new delivery channels and products, new types of financial intermediaries can also be a critical financial innovation, especially in terms of bringing new competition into the financial system. These can be micro-deposit-taking institutions that graduate from semi-formal but non-regulated NGO status into regulated financial institutions or telecoms that offer mobile money services, such as in Uganda and Kenya, respectively.

How does financial innovation come about? Incumbent financial institutions are not necessarily interested in innovating unless forced to do so by competitive pressure coming

from, e.g., new entrants into the financial system. Importantly, financial innovation cannot be introduced per regulation, but is rather introduced by market players – mostly private, though not always profit-oriented. Such innovation often comes from unexpected quarters. In Kenya, Equity Bank transformed itself from an underperforming building society into an innovative bank and is now the largest bank in the country in terms of clientele. It did this by offering new delivery channels, such as mobile branches, by targeting a new clientele, and by focusing on the quality of service delivery (Allen et al., 2013). These experiences suggest that an open, contestable banking system is needed and that new providers might come from outside the established market.

While regulation cannot drive innovation, it can encourage or prevent it. There are different regulatory approaches towards innovation. The traditional regulatory approach is that of “proper sequencing” - legislation-regulation-innovation. This process can take years, however. An alternative approach is one of try-and-see or test-and-see, as applied by regulators in Kenya with respect to M-Pesa. Such an approach is not to be confused with a laissez-faire approach. It requires an open and flexible regulatory and supervisory approach that balances the need for financial innovation with the need to watch for fragility emerging in new forms. Such an approach can take into account the unexpectedness of innovation, in terms of needs, technical possibilities and origin. As argued in a recent taskforce report on the regulation of digital finance, financial innovation calls for a risk-based and functional approach to regulation, ensuring that functionally similarly service providers are treated equally as long as they pose similar risks to the consumers of the service or the financial system as a whole (Center for Global Development, 2016). For example, payment services should receive identical treatment, whether the provider is a bank or an MNO and whether it operates online or from a brick-and-mortar office. It also implies that the regulation depends on the type of services offered by different providers, with only deposit-taking institutions that are (perceived to be) part of the financial safety net being subject to the same kind of prudential regulation as banks.

6. The gender dimension

As pointed out throughout the paper, the gender dimension is critical in the discussion on financial inclusion, both in terms of access to financial services across male and females and

in terms of female empowerment being an important outcome variable. This section summarizes some of the cross-cutting issues in this respect.

First, females are, on average, less likely to have access to formal financial services than males. At the same time, a large share of self-employed in developing countries is female and thus in need of financing. Demircuc-Kunt, Klapper and Singer (2013) document a significant gender gap in individual account holdings, though with significant variation across countries. Aterido, Beck and Iacovone (2013), however, show for several Sub-Saharan African countries, that this unconditional gender gap turns insignificant once one controls for other characteristics, a finding that holds both for individual account holding and entrepreneurial access to credit. In the case of enterprises, they explain this finding with a selection bias and in the case of individuals with gender gaps in other dimensions related to the use of financial services, such income, education, household and employment status. The findings for access to entrepreneurial credit are matched by Bruhn (2009) for Latin America. However, gender gaps in critical factors that determine access to formal financial services, including employment and income status, legal restrictions (such as in asset ownership and holding in some countries) and education, provide an important justification to focus efforts in financial inclusion on female individuals and entrepreneurs and look beyond traditional banking techniques focused on salaried, formally employed and educated individuals.

Beyond the lack of access to formal financial services by women, there are several other reasons why the microfinance movement has focused on women. It has often been argued that credit to female borrowers has more direct impact on household welfare than credit to male borrowers as they care more about children and family. However, there is a trade-off as documented by Kevane and Wydick (2011); women in childbearing age face higher time constraints due to family commitments and are less likely to expand employment in their micro-enterprise with credit than male micro-entrepreneurs or older women. Another reason is that women are often restricted from access to formal financial services due to intra-household restrictions, though this might also imply tailored solutions that protect women against having to share credit or savings proceed freely within the household. Another, supplier-focused, argument is that female borrowers constitute less of a credit risk, as they

are less mobile than men and often more conservative in their investment decision.¹¹

Repayment rates in microfinance are typically higher for women than for men.¹²

The intra-household dimension has become increasingly important and has been explored in recent field studies. Just to give some interesting examples: Schaner (2015) finds that well matched Kenyan couples (in terms of time preferences) are more likely to use joint accounts instead of costly individual ones. Ashraf (2009) finds in a field experiment in the Philippines that men or women who do not make the savings decision in their respective households are more likely to save a grant if given in private while they commit to consumption if given the grant in public.

7. Conclusions

Improving financial inclusion requires measuring it. We have made enormous progress over the past ten years in this endeavor but also realize that it is a constant learning process.

The experience over the past decade provides important lessons for data collection going forward. Measuring financial inclusion accurately has to rely on survey data, which allow a more in-depth look at the different dimensions of as well as barriers to financial inclusion, but also requires a constant update in methodology as we dive deeper into the economics and psychology of financial inclusion. To get a complete picture of access to and use of financial services and the different barriers faced by individuals in a country, however, different data sources as outlined in this paper are necessary. It is important to note the trade-off between the frequency with which data can be collected and the accuracy. Survey-based data such as the Global Findex can only be undertaken every few years but give the best approximation to financial inclusion, while proxy indicators such as collected in the Financial Access Surveys can be collected on a much higher frequency. Complementing both of these with bank-level surveys would provide an even richer picture of different cost dimensions and the choice of products available to customers, though such surveys face implementation challenges as discussed above. Combining supply and demand-side data is critical to get a complete picture of access to and use of financial services and barriers to it. It also allows the critical distinction between pure ownership of accounts and their actual use. There is also a

¹¹ For a more in-depth discussion, see chapter 7 in Aghion de Armendariz and Morduch (2007).

¹² See for example Beck, Behr and Güttler (2013) with evidence from two MFIs in Albania and Bolivia that lend to both men and women.

benefit of combining cross-country data with country-level data collection efforts, where the latter allow for more in-depth and country-specific questions.

While there is a temptation to summarize the available information into a headline indicator, a complete picture is better provided through a variety of select indicators that capture different dimensions, including different barriers to access and inclusion across different sub-groups of population.

As an increasing amount of data from different sources becomes available, there will be challenges in how to “combine” them to get a proper picture of financial inclusion in a country. Administrative and survey data, demand and supply-side indicators, aggregate and micro-level data are different approaches to the overall puzzle of financial inclusion. As much as we might wish for always consistent messages provided by these different data sources, differences between the different sources and their findings might force a dynamic approach to the gaps in financial inclusion and solutions to fill them. The access possibility frontier presented above might serve as guiding framework in this context.

The experience with progress in measuring and gauging the effect of financial inclusion also allows to draw some policy-relevant conclusions for the inclusion agenda. First, as important as financial inclusion is for the development policy agenda, it is important to not ignore financial deepening. Structural transformation of economies is more likely to come through efficient and stable financial intermediaries and markets than by democratizing credit.

Second, within the area of financial inclusion, the empirical evidence so far and a tentative cost-benefit analysis would point towards payment and savings services as the focus area. Microcredit and micro-insurance services seem most appropriate if more targeted, such as towards transformational entrepreneurs. In addition, it is important to look beyond supply side constraints. While for a long time there has been an almost exclusive focus on supply-side constraints, we have learned that demand-side constraints are as important. And as financial innovation changes the nature of financial service provision, this has important repercussion for measuring and tracking financial inclusion.

Third, following Goodhart’s Law (“When a measure becomes a target, it ceases to be a good measure”) it would be false to focus exclusively on headline indicators such as the total population share with a bank account. It is important to understand in this context that a positive impact of financial inclusion on individual and aggregate welfare does not come through the pure ownership of accounts but their active use.

Fourth and again related to the previous point, it is important to look beyond absolute levels of the indicators on financial inclusion and benchmark them appropriately to properly assess progress in inclusion and gauge the effect of policy reforms.

Finally, and discussed less in this paper, there are still important demand-side constraints, related to culture and literacy that prevent individuals from using formal financial services and that we still have to understand. Financial literacy – a topic I have not been able to discuss in this short paper – has been identified as critical constraint, but the profession still knows frustratingly little on how to improve it.

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