Financial Sector Indicators Note: 7
Part of a series illustrating how the Financial Sector Development Indicators (FSDI) project enhances the assessment of financial sectors by expanding the measurement dimensions beyond size to cover access, efficiency and stability. Data on these dimensions, as well as other information relevant for financial sector assessment, is available online at http://FSDI.

Measuring banking sector outreach

- Introducing new indicators to measure outreach; distinguishing access versus use
- Outlining the determinants of outreach
- Variations in outreach affect obstacles in financing, as well as economic growth

The outreach of broad financial services serves a variety of important functions:

- A well developed financial system is necessary for economic development and poverty alleviation (Beck, Demirguc-Kunt and Levine 2004 and Honohan 2004a). The empirical relationship between finance and growth is well established in theoretical literature, as surveyed by Levine (2005). Financial market imperfections are particularly binding on poor or small entrepreneurs lacking collateral, credit history or networks. Credit constraints impede financing of high-return projects and hamper efficient resource allocation, as well as adversely impact economic growth and poverty reduction (Galor and Zeira, 1993).
- Financial development facilitates entry of new firms which fosters economic growth (Klapper, Laeven and Rajan, 2006). Wide access to finance is seen not only as expanding opportunities beyond the rich and the connected, but also promoting democracy and market economy (Rajan and Zingales, 2003).
- Access to finance can contribute to technological progress and innovation (Ayyagari, Demirguc-Kunt and V. Maksimovic 2006).
- Finally, given its social (and economic) benefits, access to finance can be seen on a similar level as access to basic needs such as safe water, health services, and education (Peachey and Roe, 2004).

Depth versus outreach

So far the literature on financial sector development has focused primarily on the dimension of depth, its measurement, determinants and its economic impact. Little is known about the breadth or the outreach of financial systems across countries, its determinants and impact on development. This is partly due to a dearth of adequate data (see Honohan 2004b). However, when discussing outreach or access, distinction has to be made between access versus use since the two are not synonymous. Access to and the possibility of utilizing financial services is a different concept than actual usage.

New indicators to measure outreach

To characterize the outreach of banking sector, new indicators are introduced that distinguish between access to and use of financial services.

Indicators for access

Geographic:
- Number of bank branches per 1,000 sq. km.
- Number of bank ATMs per 1,000 sq. km.

Demographic:
- Number of bank branches per 100,000 people
- Number of bank ATMs per 100,000 people

For each of these indicators, data are available for 98 countries in the case of bank branches and 89 countries in the case of ATMs. Larger numbers of branches and ATMs per square
kilometers reflect smaller distance to the nearest physical bank outlet and thus easier geographic access. Per capita measures of branches and ATMs reflect the average number of people served by each physical outlet and therefore higher values imply fewer clients per branch or ATM, or in other words easier access.

**Geographic and demographic outreach different**

As would be intuitive, in general, geographic and demographic (per capita) access is significantly higher in industrialized countries than in developing countries.

**Geographic access:** The number of bank branches per area ranges from less than 0.19 branches per 1,000 square kilometers (the bottom 5th percentile of the distribution) for Bolivia and Namibia, to almost 375 branches per 1,000 square kilometers (the top 5th percentile) for Malta and 102 for Italy (Figure 1). The median number of branches per 1,000 sq. km. is 4.80, similar to that for Mexico. Focusing on the ATM information (Figure 2), Nepal ranks at the bottom with less than 0.26 ATMs per 1,000 sq. km, while the top 5th percentile includes Malta and Japan with figures of 463 and 397 respectively. The median number of ATMs is about 10 per 1,000 sq. km, with values for Mexico and Malaysia being close to the figure.

**Demographic access:** The spectrum ranges from 0.53 branches per 100,000 people (bottom 5th percentile), to 96 branches per 100,000 people in Spain and 52 in Italy (the top 5th percentile). The median is about 8.5 branches per 100,000 people, close to that for Indonesia (Figure 3). In terms of the number of ATMs, (Figure 4), Bangladesh ranks the lowest with less than 0.06 ATMs per 100,000 inhabitants. In comparison, Spain and the United States, which are in the top 5th percentile, have more than 120 ATMs per 100,000 people. The median is about 17 ATMs, similar to that in Mexico.

However, the relative ranking for the two forms of access is not necessarily uniform for countries. For example, in terms of bank branches, the U.S. ranks ninth for geographic access, with about 10 branches per 1000 sq. km., but is fourth in terms of branches per 100,000 people. Strong contrast also exists for Malta.
**Indicators for usage**

The use of financial services can be gauged through the following indicators:

- **Number:**
  - Number of loans per 1,000 people
  - Number of deposits per 1,000 people

- **Size:**
  - Average size of loans to GDP per capita
  - Average size of deposits to GDP per capita

Information on the number and the value of loans is available for 44 countries, and that for deposits, 54 countries. Higher number of loans and deposits, and their lower ratios to GDP per capita reflect use of banking services by a greater share of the population and by “smaller-size” client base. In comparison, higher ratios indicate the use of banking services being relatively limited and likely to be afforded primarily by wealthier individuals or larger enterprises.

**Usage restricted in poorer countries**

The pattern of loans and deposits suggest that the use of banking services is restricted in poorer countries. Though not proportionate, the usage varies with the level of income category.

Majority of the developing countries with high number of loans and deposits fall in the upper middle-income category. The restricted usage of banking services in poorer countries is also validated in the information on ratio of loans (deposits) to GDP per capita. The average size of loan (deposit) compared to GDP per capita is significantly higher in low-income countries, suggesting concentration in the utilization of services.

**Number of loans and deposits:** Within the sample of information, the median number of loans per capita is about 81 loans per 1,000 people, close to the figure for Namibia. Countries in the lowest 5th percentile of the distribution, such as Madagascar have about 4 loans per 1,000 people. In comparison, the top 5th percentile comprises countries, such as Poland with about 775 loans per 1,000 people (Figure 5). Considering the number of deposits per capita, the median value is 529 deposit accounts per 1,000 people, close to the value for Brazil. The top 5th percentile for this distribution is about 2,700 deposits for Denmark. The bottom 5th percentile has fewer than 5 deposit

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**Figure 3 Number of branches per 100,000 people**

<table>
<thead>
<tr>
<th>Country</th>
<th>Percentile 95</th>
<th>Percentile 75</th>
<th>Percentile 50</th>
<th>Percentile 25</th>
<th>Percentile 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spain</td>
<td>52.07</td>
<td>32.05</td>
<td>8.84</td>
<td>1.57</td>
<td>0.53</td>
</tr>
<tr>
<td>Italy</td>
<td>45.60</td>
<td>30.86</td>
<td>14.59</td>
<td>4.80</td>
<td>1.33</td>
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**Figure 4 Number of ATMs per 100,000 people**

<table>
<thead>
<tr>
<th>Country</th>
<th>Percentile 95</th>
<th>Percentile 75</th>
<th>Percentile 50</th>
<th>Percentile 25</th>
<th>Percentile 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spain</td>
<td>126.60</td>
<td>67.20</td>
<td>16.60</td>
<td>4.84</td>
<td>0.53</td>
</tr>
<tr>
<td>United States</td>
<td>120.94</td>
<td>64.18</td>
<td>14.91</td>
<td>4.80</td>
<td>0.46</td>
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accounts per 1,000 people, such as that for Madagascar (Figure 6).

Average size: First, considering the loan size. The ratio of average loan size to GDP per capita is presented in Figure 7. The top 5th percentile comprises countries, such as Bolivia (27.8) and Madagascar (18.3). The bottom 5th percentile includes middle-income countries, for example, Turkey (0.65) and Poland (0.33), indicating more widespread use of banking services by small firms and poor households. Second, focusing on the deposits (Figure 8). The top 5th percentile for the distribution comprises primarily low-income countries, including Zimbabwe and Madagascar. The bottom 5th percentile comprises primarily middle-income countries, such as Dominican Republic and Russia, indicating wider use of banking by small firms and poor households.

Limitations of new indicators
Notwithstanding the novelty of the new indicators, recognizing their limitations is important.

- Both area- and population-based ratios of the number of bank branches and ATMs may be limited as indicators of physical access to banking outlets because they assume a uniform distribution of outlets, both in terms of area and population. In reality, in many countries, bank branches and ATMs are concentrated in urban areas, with accessibility limited to surrounding areas.
- The number and average size of loan and deposit accounts have a couple of limitations. First, individuals or firms may receive more than one loan or have more than one deposit account, thereby distorting the picture of the use of banking services. Second, the average size of loans and deposits to GDP per capita might not be representative of the value of services that a typical individual might receive.
- The data for new indicators are available for a point in time, making it difficult to examine the relationship between financial outreach and economic development over time.
- Focus on only a couple of banking services, deposit-taking and lending, leaves out other important financial services, such as payment and insurance. Similarly, the indicators presented concentrate on banks and, therefore, do not take into account other financial service providers, such as microfinance institutions or cooperatives. Again this is due to the scarcity of data on these institutions.
- The new indicators are crude quantity-based indicators of outreach. They ignore new
channels of delivery of financial services and fail to consider the costs of accessing and using banking services.

However new indicators predict usage

While the new indicators only roughly reflect access to and use of banking services, they can predict outreach for households and firms. In particular, the share of households with deposit accounts (as obtained from surveys) is positively and significantly correlated with bank branch and ATM penetration (both, in geographic and demographic dimensions), as well as with deposit accounts per capita. Also, it is negatively and significantly correlated with the deposit-income ratio. Figure 9 shows the correlation between the actual share of households with accounts and the predicted share of households with accounts based on a econometric model where the share of households with accounts are explained by the number of deposit accounts per capita and the number of branches per capita. The correlation between the predicted and the actual share is 91 percent.

The share of small firms with bank loans is significantly and positively correlated with loans per capita and the demographic branch and ATM penetration. Figure 10 shows the correlation between the actual share of small firms with bank loans and the predicted share of small firms with bank loans from a model where the share of small firms with bank loans are explained by the number of loan accounts per capita and the number of branches per capita. The correlation between the predicted and the actual share is 53 percent.

Thus, in the absence of surveys on the use of deposit and loan services for a broad cross-section of countries, the aggregate new indicators provide a good approximation of the extent to which household and firms use deposit and loan services, respectively (Figures 9 and 10).

**Determinants of outreach**

Analysis to examine variations in outreach across countries and the role of factors relevant for financial sector depth in outreach as well, reveals the following:

- Economic size and population density have a positive impact on financial sector depth and outreach. More densely populated countries have higher geographic branch and ATM penetration, and show evidence of greater use
of loan and deposit services. Larger countries have higher numbers of branches and ATMs per capita and tend to use more loans and deposits in per capita terms.

- The quality of the overall institutional environment affects both the financial sector outreach and depth, but the impact varies. The cost of contract enforcement and the credit information environment influences both outreach and depth, however, the specific rights of creditors appear only to affect depth and not the outreach. Bank branch and ATM penetration are positively and significantly associated with better credit information and lower costs of contract enforcement, while these indicators do not have significant impact on loans and deposits. The creditor rights index has no significant effect on outreach.

- Restrictions on banking freedom and high government bank ownership limit both the outreach, as well as the depth. More specifically, the variable “Restrictions on Banking Freedom” is negatively (and significantly) associated with the branch, ATM and loans per capita indicators, while government ownership is negatively (and significantly) associated with branch and ATM penetration. The presence of foreign banks does, however, does not seem to increase outreach or depth either. These findings do not support normally upheld view that government-owned banks help improve outreach, while foreign-dominated banking sectors are characterized by a narrower outreach, since foreign banks tend to cherry-pick the best and often wealthiest clientele.

- Infrastructure related to communication and transport positively affects the banking sector outreach and breadth. Indicators such as “Telephone Mainlines per Capita” and “Rail km per 100 km²” can be used as proxies for communication and transportation infrastructure, respectively. Better infrastructure reduces the cost of delivery of banking services and streamlines the cost of extending bank outlets, thus increasing the access to and use of banking services.

Outreach reduce obstacles to finance and compliments growth
The outreach indicators help explain dimensions of financial sector development beyond depth. Also, a wider banking system outreach lowers obstacles in financing faced by firms and complements their growth (firm-level data from World Bank).
Business Environment Survey, where 36% of firms in the sample used rated financing as a major obstacle. Firms in countries with higher penetration of physical bank outlets report facing lower financing obstacles. However, there is no significant association between the use of deposit services and financing obstacles. Firms in countries with higher loans per capita also report facing lower financing obstacles, while the loan-income ratio does not seem to be a significant factor.

**Lowering financing constraints.** An increase in the number of bank branches (ATMs) from the 25th to the 75th percentile decreases the probability that firms rate financing constraints as a major obstacle by over three (eight) percentage points in the case of branches (ATMs) per population and less than one (half) percentage point in case of branches (ATMs) per area. A similar change in the ratio of loans per population decreases the likelihood of finance being rated as a major obstacle by over eight percentage points.

**Complimenting growth.** Greater demographic branch and ATM penetration is associated with faster growth rate of firms, as measured by the percentage change in sales over the last three years. Also, the growth rate of firms is higher in countries with higher number of loans per capita. The economic effects of outreach on the growth rate of firms are considerable. A one percent increase in the ratio of branches per capita leads to a 0.17 percent increase, on average, in the growth of sales. A similar increase in the number of ATMs per capita results in a 0.27 percent increase in sales growth. Loans per capita appear to have the largest economic impact, with a percent point change inducing almost an average of 0.5 percent change in sales growth.


**Select References**


**http://FSDI**

Information on indicators of access, as well as a wealth of indicators on other dimensions and sub-sectors of financial system is available on line. The Web site also offers analyses and framework that provide comprehensive assessment of financial sector.