

## Executive Summary

In recent years much progress has been made in financial inclusion globally, including in Asia and the Pacific. Nevertheless, financial inclusion gaps remain large across and within countries. Close to half of the adult population in low- and middle-income Asia-Pacific economies does not have a bank account, and less than 10 percent has borrowed from formal financial institutions. Lack of access to formal finance leaves poor households more vulnerable to adverse shocks and poverty traps. While Asia-Pacific countries have made significant strides using financial technology (fintech) to support financial inclusion, the region's use of fintech is uneven, exhibiting large gaps between the rich and poor, men and women, and rural and urban areas.

This paper takes stock of the development and current state of financial inclusion in the Asia-Pacific region. It focuses on the impact of financial inclusion on economic growth, poverty reduction, and income inequality, and the linkages between financial inclusion and macroeconomic policies, as well as structural policies. Given the increasing importance of financial technologies, the paper also provides a snapshot of the fintech landscape in the region. Main findings in this paper include the following:

- Financial inclusion does matter for economic growth and is associated with a reduction in poverty and inequality. Empirical results point to potentially significant growth benefits from financial inclusion, with the largest gains for low-income and developing countries. Simulations indicate that raising financial inclusion in low-income countries to the levels in Asia's emerging market economies could significantly reduce the region's population living in poverty and income inequality.

- Financial inclusion also affects macroeconomic policies. The analysis in the paper suggests that financial inclusion can enhance central banks' ability to stabilize economic activity. Similarly, financial inclusion can affect fiscal policy effectiveness and improve public financial management.
- Fintech is playing a growing role in improving financial inclusion and should be an important component of a national financial inclusion strategy. Linking financial inclusion to national development strategies can help boost resources and align fintech strategies with other development initiatives

The large benefits of financial inclusion suggest that it should become a part of a country's inclusive growth strategy. Such a strategy should target vulnerable groups such as the rural population, low-income households, the elderly, women, and geographically remote communities. Asia's experience with financial inclusion also highlights the benefits of a holistic approach, which calls for concerted action across macroeconomic, financial sector, structural reform, and regulatory policies. It also emphasizes the importance of financial literacy and infrastructure policies. Policymakers should also encourage social experimentation and partnerships between the public and private sectors when pursuing financial inclusion goals.

## Introduction and Overview

Financial inclusion is recognized as an important vehicle to promote inclusive growth and reduce poverty. Much progress has been made in financial inclusion, but gaps remain large in many parts of the world, including Asia and the Pacific. Today, 47 percent of the adult population in low- and middle-income countries still does not have a bank account, and only 9 percent of the population borrowed from formal financial institutions in 2016. Women and young adults (age 15–24) often face even greater challenges in accessing financial services. Many micro, small, and medium enterprises (MSMEs) and farmers face limited access to credit and often rely on informal markets for finance, at high costs. Lack of access to formal finance leaves poor households more vulnerable to adverse shocks and poverty traps.

There is broad agreement among practitioners and researchers over the definition of financial inclusion. This paper defines financial inclusion as access to and use of formal financial services by households and firms. Financial inclusion is generally measured across three dimensions: (1) *access* to financial services, (2) *usage* of financial services, and (3) the *quality* of financial products and service delivery (see also IMF 2015b). Similarly, the Indian government's Committee on Financial Inclusion defines financial inclusion as delivery of financial services at an affordable cost to vast sections of disadvantaged and low-income groups (Government of India 2008). In an inverted formulation, Leyshon and Thrift (1995) define financial exclusion as “those processes that serve to prevent certain social groups and individuals from gaining access to the financial system.” Finally, the World Bank defines financial inclusion as the proportion of individuals and firms that use financial services (World Bank 2014).

This paper takes stock of the development and current state of financial inclusion in the Asia-Pacific region.<sup>1</sup> The rich regional experience with financial inclusion, along with those of other regions, provides a good opportunity to reflect on past progress and look to the future. This paper focuses on the impact of financial inclusion on economic growth, poverty reduction, and inequality; linkages between financial inclusion and macroeconomic policies; and structural policies that can advance the region's financial inclusion agenda.<sup>2</sup> Given the increasing importance of financial technologies (fintech), the paper also provides a snapshot of the fintech landscape in Asia-Pacific. The paper aims to enhance policy prospects, share lessons learned from recent experience and social experimentation, and provide empirical analysis and case studies that explore how best to move forward with the financial inclusion agenda.

The paper highlights several key findings regarding the development and state of financial inclusion in Asia-Pacific:

- Asia-Pacific has made significant progress in financial inclusion and the pace in recent years has been rapid. Nevertheless, across-country and intracountry disparities are among the highest in the world and, in particular, the gaps between the rich and the poor, rural and urban populations, and men and women remain deep.
- Income is a predominant determinant of the level of financial inclusion. However, other factors, such as geography, financial sector structure, and policies, also play important roles. Pacific island countries face some unique challenges in advancing financial inclusion because of their geographic dispersion, remoteness, and small market size.
- While some countries in Asia-Pacific are leaders in fintech, on average the region lags behind others in several important areas: online (internet) purchases, electronic payments, mobile money, and mobile government transfers. Furthermore, the region's use of fintech is the most uneven in the world, exhibiting large gaps between the rich and poor, and between rural and urban areas.

This paper builds on the literature examining the macroeconomic impact of financial development and more recently financial inclusion. Seminal work by Beck and Levine (2004) and other research, including by the IMF (2016), have analyzed the impact of financial deepening/inclusion on growth, inequality, and stability. The World Bank (2013) has created composite

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<sup>1</sup>For this paper, the region is defined as countries in the IMF's Asia and Pacific Department. For a country list, see <http://www.imf.org/external/region/apd/index.aspx> and see Appendix 1 (published in the online version of the paper) for data availability.

<sup>2</sup>This paper does not address financial stability aspects of financial inclusion, which is well covered in earlier work (see IMF 2015e).

indices of financial inclusion, while other institutions have examined the regulatory and supervisory reforms to support financial innovation while safeguarding stability. More recently, the IMF (2018) has analyzed the impact of digitalization on fiscal outcomes. This paper contributes to this research by examining the Asia-Pacific experience with financial inclusion and its policy implications.

This study provides further evidence that financial inclusion helps boost growth, reduce poverty, and lower inequality. These benefits can be substantial. For example, closing the gap between the least financially inclusive country and the median country in the region could raise GDP growth by 1 percentage point over a five-year period. Moving less inclusive countries to the median could reduce the number of people in poverty in the Asia-Pacific region by about 4 percent. Moreover, a similar improvement in inclusion could lower the Gini coefficient by about 10 to 20 percentage points from current levels of 30 to 43 percentage points.

Asia's experience with financial inclusion highlights the benefits of a holistic approach, recognizing that policies for tackling the gaps in financial inclusion are mutually reinforcing. A holistic approach would call for concerted action across macroeconomic, financial sector, structural reform, and regulatory policies and emphasizes the importance of financial literacy and infrastructure strategies, centered on the internet, telecommunications, and other technological innovations. Specifically, a holistic approach should include the following elements:

- *Structural reforms and financial sector policies should continue to aim to remove obstacles to access to formal services:* Improvements in financial infrastructure have been critical to financial inclusion over the past decades, and continued efforts in areas such as credit bureaus, asset registration, payment systems, and micro-finance institutions would further reduce the cost of financial services. Greater transparency in financial services and fiscal operations in turn would encourage greater use of formal systems.
- *Countries should allocate adequate resources to invest in technology infrastructure, such as internet and mobile phone connectivity, to enable greater financial inclusion:* In some countries, further liberalization of the telecommunications and internet industries would help bring down costs and improve services. This in turn would increase penetration rates, ensure stable connectivity, and make mobile financial services more affordable and available, especially for disadvantaged groups.
- *Policymakers should leverage fintech innovations for financial inclusion and tilt policies toward disadvantaged groups to close digital divides:* Fintech plays a vital role by complementing traditional approaches to financial inclusion. Close collaboration with the private sector can help achieve inclusion goals.

At the same time, policymakers from various government agencies and regulatory bodies need to coordinate and strike the right balance between encouraging fintech innovations and ensuring financial stability.

- *More resources should be devoted to financial and technology literacy as part of a broader inclusion strategy:* The emphasis should be on effective education for both service suppliers and consumers to enhance support and protect consumers of financial services. This is important not only to increase demand for financial services, but also to close inclusion gaps and mitigate the risks from greater exposure to financial services and technology.
- *Policymakers should encourage social experimentation and partnership between the public and private sectors in pursuing financial inclusion:* As demonstrated by the Grameen Bank's microcredit initiative and mobile payments in some African countries, social experimentation encourages innovation, entrepreneurship, and grassroots ingenuity. Such experimentation, supported by public policy, may be even more important for completing the financial inclusion journey.
- *Finally, macroeconomic and financial inclusion policies should take into account their interlinkages:* Financial inclusion, by strengthening the interest rate channel of transmission, can enhance the effectiveness of monetary policy as a tool for macroeconomic management but also amplify its distributional impact.<sup>3</sup> Financial inclusion can also raise the efficiency and effectiveness of fiscal policy by boosting revenue collection and improving spending efficiency, which in turn can generate more resources for promoting inclusive growth. In addition, financial inclusion can enhance the countercyclical role of fiscal policy by raising the fiscal multiplier.

The rest of the paper is organized as follows. Chapter 2 provides an overview of the current state and development in financial inclusion in Asia and the Pacific. Chapter 3 focuses on empirical analysis of the economic impact of financial inclusion, including on economic growth, poverty, and inequality. Chapter 4 analyzes interactions between financial inclusion and macroeconomic (monetary and fiscal) policies. Chapter 5 examines the role of financial technology. Chapter 6 provides several case studies. Chapter 7 concludes the paper with a discussion of the way forward.

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<sup>3</sup>The recent empirical research (IMF 2015e, 2015b) found that financial stability risks increase when access to credit expanded without proper supervision. However, countries with strong supervision could see some financial stability gains from higher inclusion. In contrast to credit access, increases in other types of access to financial services, such as access to automated teller machines (ATMs), bank branches, and transaction accounts, do not affect financial stability.

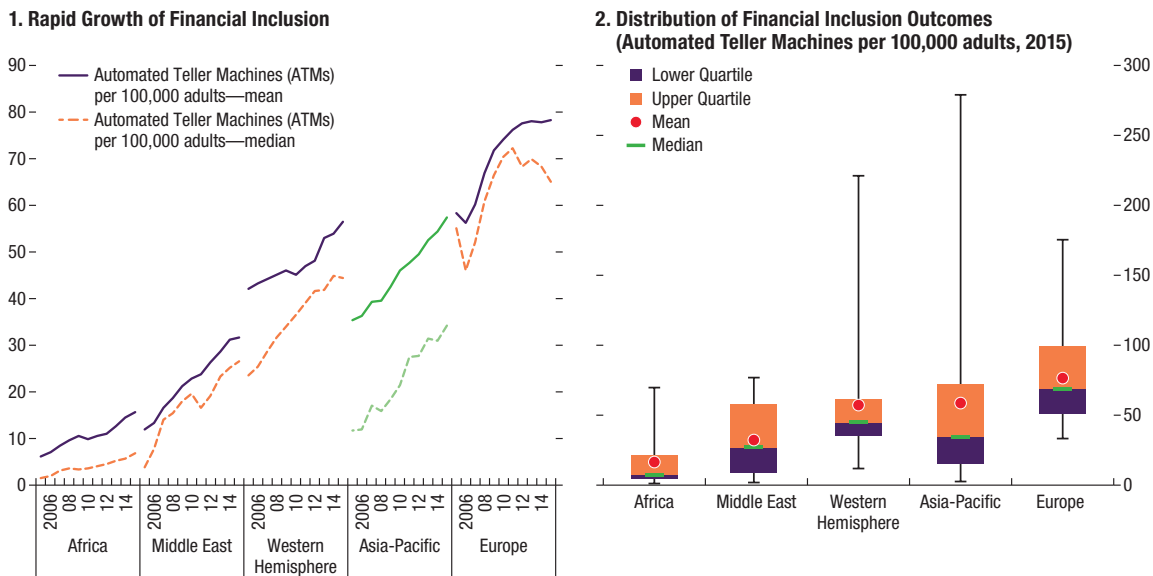
## Financial Inclusion in Asia-Pacific— Stylized Facts

Asia-Pacific countries have made significant progress in financial inclusion along with financial deepening, broadly in line with other regions (Figure 1, panel 1). The use of financial services in the region's emerging market economies is comparable to that of their peers in aspects such as having an account, borrowing, using ATMs, and sending remittances through financial institutions. Asia-Pacific's low-income and developing countries (LIDCs), however, fare better in both financial access and usage when compared with their peers in other regions, particularly in measures of having an account and borrowing. Both emerging market economies and LIDCs in the region tend to perform well in financial access for enterprises, which are less likely to identify access to finance as a major constraint, despite the higher collateral requirement for loans (World Bank 2017).

Despite the improvement, financial inclusion in Asia-Pacific varies substantially across countries, more so than in other regions (Figure 1, panel 2). The region has the largest disparity in access to finance based on indicators such as access to an ATM or the formal banking sector (Figure 1, panel 2). While some Asian countries are at the forefront of financial inclusion, others are able to provide access to only basic financial services. In Malaysia and Mongolia, for example, most households actively use banks for saving and borrowing and frequently use mobile phones to make payments. In contrast, informal financing remains important in countries such as Myanmar and Nepal, where, despite recent efforts, less than 40 percent of the households have a bank account.

Asia-Pacific countries have made significant strides on the use of technology to support financial inclusion. Adoption of digital financial services has recently picked up in many countries, including EFTPOS-supported

Figure 1. Asia's Rapid Financial Inclusion with Wide Disparity



Source: IMF Financial Access Survey.

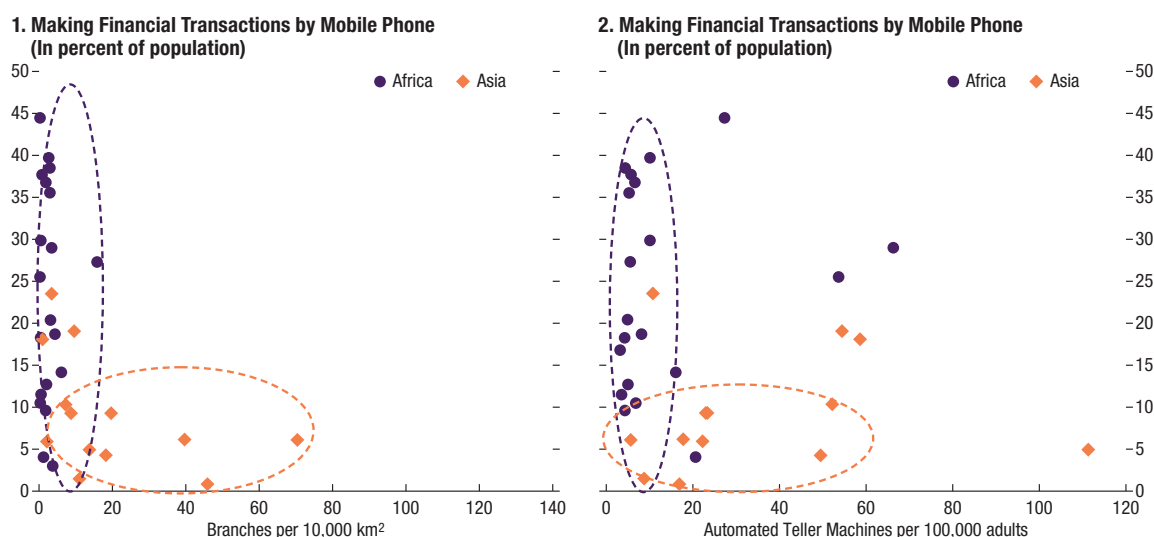
branchless banking,<sup>1</sup> mobile banking, and mobile money, which has grown noticeably in Bangladesh, Indonesia, and Mongolia. In PICs, where geographical dispersion represents a major obstacle to providing financial services, mobile-based financial products have seen a substantial uptake, such as in Samoa. China, Malaysia, Mongolia, and Thailand among emerging market economies, and Bangladesh and Cambodia among LIDCs, are leaders in mobile payments (World Bank Global Financial Index [Findex]). In addition, Bangladesh, Cambodia, and the Philippines have seen increased use of mobile phones in sending cross-border remittances.

However, mobile banking in most Asia-Pacific countries lags behind that in sub-Saharan Africa. For example, while the Asia-Pacific region is ahead of sub-Saharan Africa in traditional infrastructure such as bank branches and ATMs, in mobile transactions it is substantially behind Kenya, Uganda, Tanzania, and Zimbabwe, where more than 70 percent of the population uses mobile technology for receiving remittances. The L-shaped relationship (Figure 2) between traditional infrastructure and the use of mobile technology for financial inclusion suggests that countries with less traditional infrastructure have stronger incentives to use mobile technology as a cost-effective alternative, an issue that will be discussed further in the fintech section of this paper.

<sup>1</sup>EFTPOS stands for electronic funds transfer at point sale.



Figure 2. Physical Infrastructure and Use of Technology for Financial Transactions

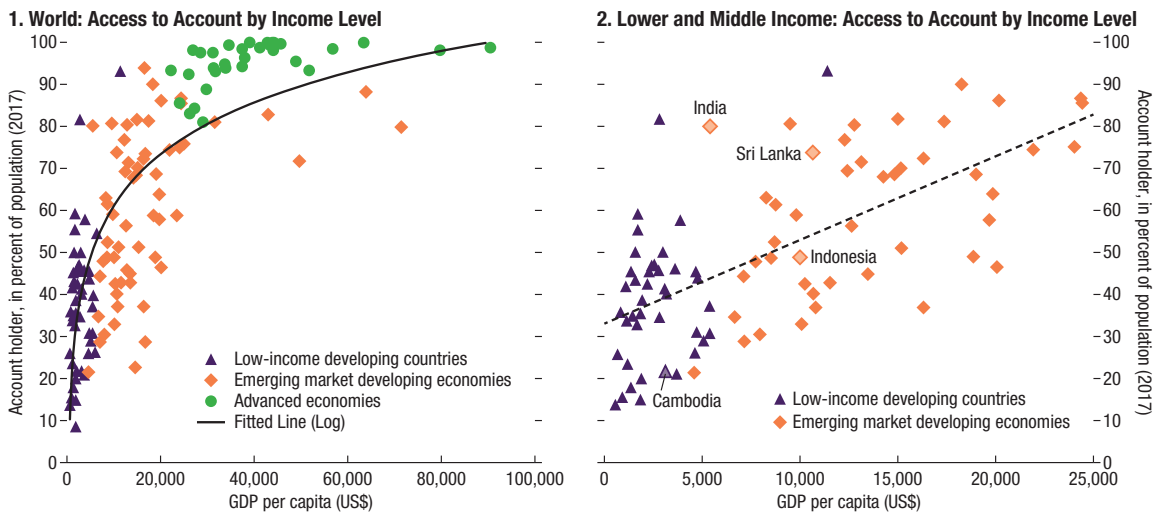


Sources: IMF Financial Access Survey; and World Bank Global Findex.

Income level is a key determinant of financial inclusion, but other factors, such as banking structure, geography, and policy, also play a role (Figure 3). Countries at higher income levels typically exhibit higher financial inclusion, but economies at similar income levels can differ in their levels and attributes of financial inclusion. For example, per capita income in India is higher than in Cambodia, and a higher percentage of people in India have bank accounts than in Cambodia. However, Cambodia has greater financial inclusion in terms of mobile payments, thanks to a strong public-private partnership in promoting mobile financial services. Indonesia and Sri Lanka have similar levels of per capita income, but Sri Lanka has used the formal banking system for financial inclusion while Indonesia, with its greater geographic dispersion, has relied more on mobile banking.

Small states in Asia-Pacific face major challenges from geographic dispersion as well as their small size. Many of these countries consist of small islands that are widely dispersed and sparsely populated, making the delivery of financial services expensive. Severe infrastructure gaps, narrow production bases, and high dependence on imports contribute to high transaction costs. These countries' vulnerability to natural disasters also raises the risk premium associated with financial services. In addition, many PICs face difficulty in maintaining correspondent banking relationships, which has increased the costs and complexities in transferring money and sending remittances (Alwazir and others 2017, also see the Samoa case study below).

Figure 3. Financial Inclusion and Income Level

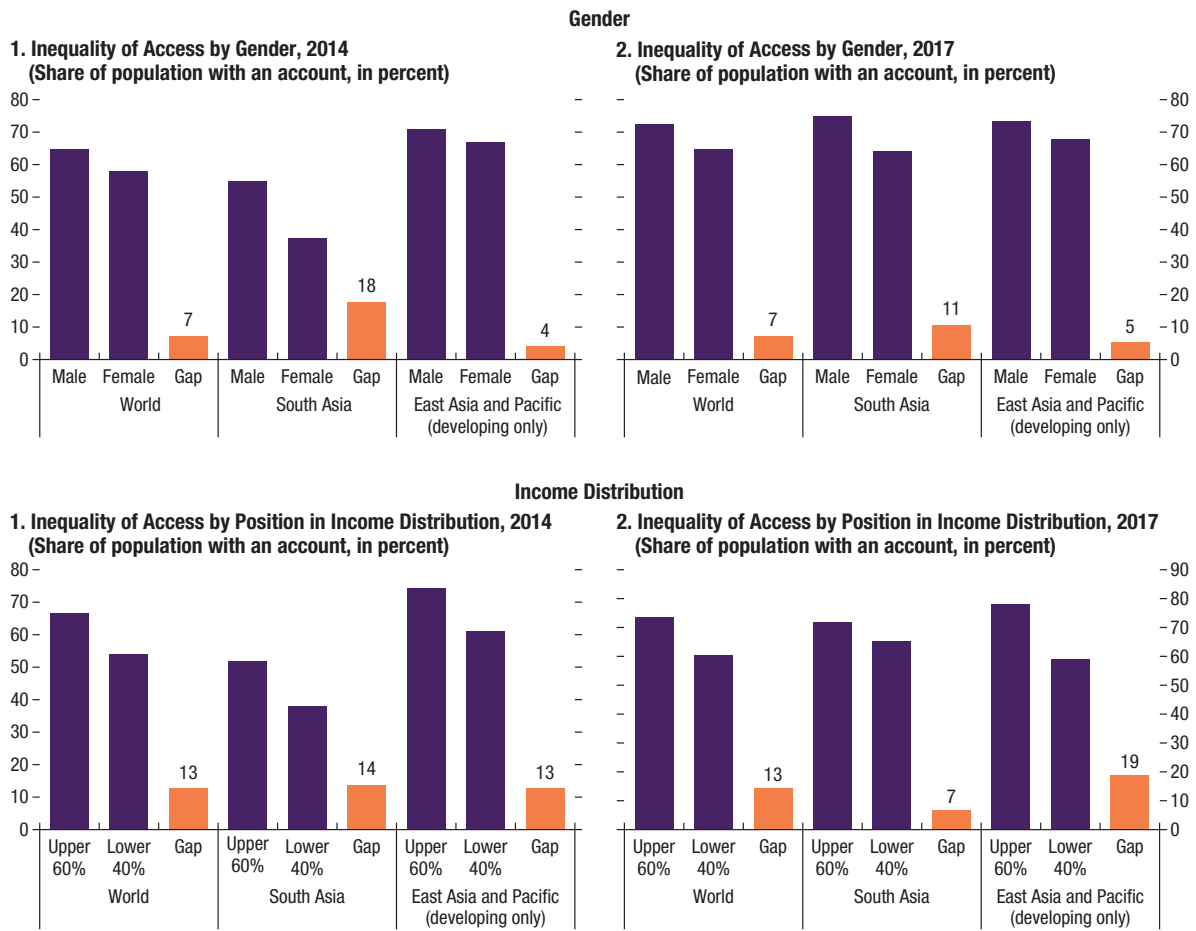


Sources: Financial Access Survey; and Global Findex.

The disparity of financial inclusion in Asia is also significant within countries. Despite recent improvements, large gaps still remain in access to financial services between the rich and the poor, urban and rural dwellers, and men and women. For example, in Indonesia, only about 10 percent of adults from the poorest quintile have a formal bank account, compared with about 60 percent from the richest quintile. Similarly, in India, only about 46 percent of male adults from the poorest quintile have a formal account, compared with 79 percent from the richest quintile. India’s disparity between the richest and poorest groups is even more pronounced when measured by use of mobile transactions (fourfold difference) or borrowings from a financial institution (about threefold difference). Despite recent progress, gender disparities have been significant, particularly in South Asia, where less than 40 percent of women have a bank account, compared with nearly 60 percent of men (Figure 4) (Global Findex 2017).

Asia-Pacific countries need to redouble efforts to address large disparities in financial inclusion. The concentration of financial exclusion among vulnerable groups such as the young, uneducated, and unemployed, as well as the poor in rural areas, is a major concern. Evidence presented in the next section suggests that financial exclusion is associated with higher poverty and greater income inequality, as well as lower overall economic growth. Addressing financial exclusion and inequality is important for inclusive growth, and the sharing of experiences among Asia-Pacific countries will be valuable for formulating policies that reduce such disparities.

Figure 4. Average Within-Country Inequalities (Aggregated by Subregion)



Source: Global Findex.

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## The Economic Impact of Financial Inclusion in Asia-Pacific—An Empirical Analysis

While it is widely accepted among researchers and policy makers that financial inclusion matters for growth, poverty, and inequality,<sup>1</sup> identifying the precise relationship between those is challenging. The lack of access to a formal financial system, arising from insufficient income, high-risk profiles, and market imperfections, could result in suboptimal savings and investment. Policies that focus on financial inclusion could ease access to finance, boost investment and consumption, increase income levels, and correct market failures and imperfections. Empirical analysis, however, faces several constraints, such as dealing with limited data and causality between financial inclusion and growth, which could lead to omitted variables, measurement errors, or endogeneity problems. To address these statistical issues, the econometric approach here controls for various factors linked to growth, including human capital, rule of law, government involvement, and economic and financial crises.<sup>2</sup> Furthermore, this study uses a new index of financial inclusion (FI index) that allows for more robust estimation across a range of indicators (Table 1).<sup>3</sup> Nevertheless, given these limitations, the empirical results should be interpreted as correlations between financial inclusion and macroeconomic outcomes, rather than causality.

The results point to potentially significant growth benefits from financial inclusion, especially for low-income and developing countries in Asia-Pacific. Financial inclusion, as measured by the new FI index, appears to be positively correlated with per capita income growth (Figure 5). The benefits of financial inclusion for growth also decline as it progresses, suggesting that LIDCs would benefit the most from expanding financial inclusion than

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<sup>1</sup>Examples of studies on this subject include IMF (2015a), Park and Mercado (2016), Burgess and Pande (2015), Allen and others (2013), and Honohan (2008).

<sup>2</sup>See Appendix 2 for technical details.

<sup>3</sup>See Appendix 2 and Mialou and others (2015) for the methodology of constructing the FI index.

**Table 1. Financial Inclusion Index—Ranking, 2015<sup>1</sup>**

	Country	Rank	Country	Rank
Fourth Quartile	Singapore	1	New Zealand	16
	South Korea	2	Marshall Islands	17
	Japan	3	Fiji	18
	Maldives	4	Vietnam	19
	Thailand	5	Australia	20
	Brunei	6	Vanuatu	21
	Indonesia	7	Nepal	22
	Tonga	8		
Third Quartile	India	9	Mongolia	23
	China	10	Bhutan	24
	Sri Lanka	11	Cambodia	25
	Philippines	12	Timor-Leste	26
	Bangladesh	13	Lao P.D.R.	27
	Samoa	14	Solomon Islands	28
	Malaysia	15	Myanmar	29
			Papua New Guinea	30

<sup>1</sup>The quartiles are based on the country rankings. Color indicates the index value, ranging from the highest (dark green) to lowest quartile (orange), with Malaysia representing the median level of financial inclusion among countries in Asia.

The index is based on 3 indicators: ATMs per 100,000 adults, Bank branches per 100,000 adults, and Bank branches per 1,000 km<sup>2</sup> (Appendix 2). Thus, it mainly captures financial access. Limited country coverage of more indicators prevented construction of the index that could reflect additional aspects of financial inclusion.

their more advanced peers.<sup>4</sup> For illustrative purposes, a 1 percent increase in the financial inclusion index level in LIDCs—which is equivalent to improving financial inclusion from the fourth quartile to third quartile (for example, from Cambodia’s level to Vietnam’s; see Table 1)—is associated with a cumulative 0.14 percentage point increase in per capita income growth over a five-year period. In contrast, the same improvement for high-income countries is associated with a gain of only about 0.09 percentage point. Based on these results, an increase in financial inclusion level from the bottom quartile to the median could be accompanied by an increase of 0.2 percent in per capita income growth over a five-year period.

Greater financial inclusion, as measured by the new index, is associated with significant poverty reduction (Figure 6).

This result is robust to various specifications and poverty measures. As an illustration of this relationship, an increase in the financial inclusion index level of 1 percent, corresponding to moving from the fourth to third quartile, is estimated to lower the poverty level by 1.4 percent of the total population in Asia-Pacific over a five-year period.<sup>5</sup> If all Asia-Pacific countries with low financial inclusion would improve it to the level of Asia’s emerging market frontier, Thailand, the region’s population in poverty could fall by about 4 percent of the region’s 2015 poverty count (equivalent to 20 million people). Even if the region’s less developed countries could converge to the level of financial inclusion in Malaysia, a median country, this could be associated with a decline in the region’s population in poverty by 1 million, roughly equivalent to the entire number of people living in poverty in Sri Lanka.<sup>6</sup>

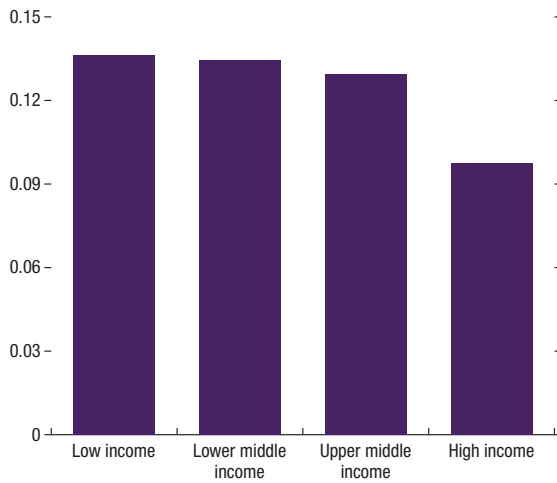
<sup>4</sup>The results are consistent with IMF (2015a) and robust to alternative specifications (based on Barro and Sala-i-Martin 1992).

<sup>5</sup>This result is derived from the estimated coefficient of the financial inclusion index from equation 5 in Appendix Table 3.1, based on each country’s gap vis-à-vis Thailand in the financial inclusion index (Table 3 in Appendix 2, all appendices are published in the online version of the paper). The indirect impact on poverty via the growth effect of financial inclusion is not considered here.

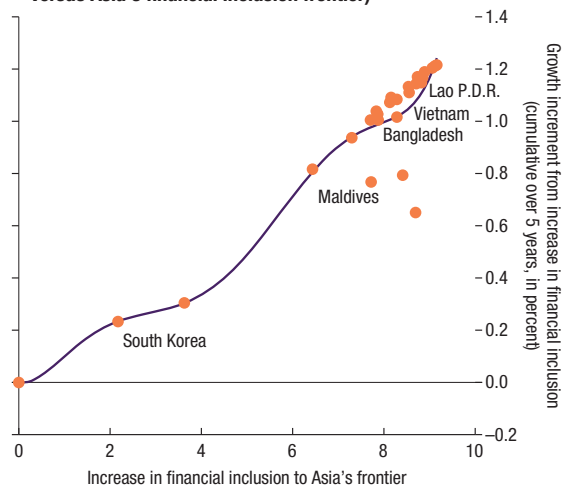
<sup>6</sup>The levels of financial inclusion in India, Indonesia, and China are above the median, and excluding these countries from this simulation significantly reduces the estimated impact on poverty because the absolute numbers of people living in poverty in these countries are large.

Figure 5. Financial Inclusion and Marginal Growth Benefits

1. Financial Inclusion and Growth by Country Income Levels<sup>1</sup> (In percent)



2. Marginal Impact of Financial Inclusion on Per Capita Income Growth (Based on country's income level, and by closing gap versus Asia's financial inclusion frontier)

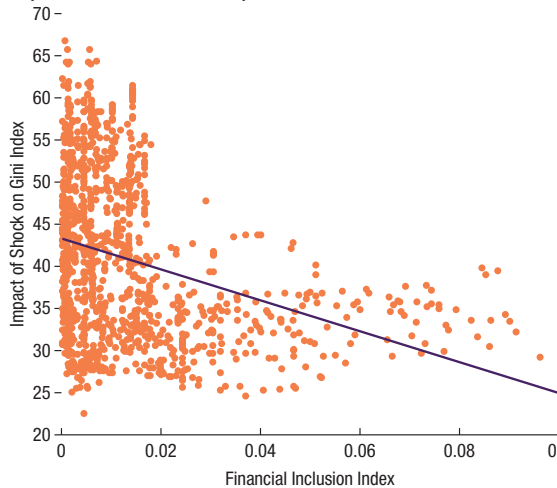


Source: IMF staff estimates.

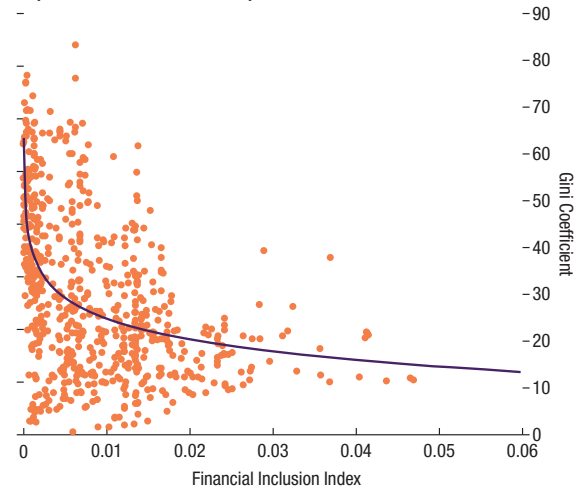
<sup>1</sup>Marginal effect of financial inclusion on growth at different country-income level, following the World Bank's classification. The estimates apply the median incomes in each income group to calculate the estimated marginal effects of each group.

Figure 6. Financial Inclusion, Poverty, and Inequality

1. Financial Inclusion and Poverty (Financial Inclusion Index)



2. Financial Inclusion and Inequality (Financial Inclusion Index)



Sources: IMF, Financial Access Survey; and World Bank, World Development Indicators.

**Figure 7. Financial Inclusion and Inequality**  
*(A decline in Gini coefficient if a country reaches Asia's financial inclusion frontier)*



Source: IMF staff estimates.

The results also provide further evidence that financial inclusion can help reduce income inequality. Simulations indicate that closing the gaps relative to the level of Singapore would be associated with a significant narrowing of intracountry inequality in the region, with the Gini coefficient falling by as much as 10–20 percentage points (from the current level of 30–43 points) across countries depending on their initial levels of financial inclusion and inequality (Figure 7). The empirical results are robust to different measures of income inequality, including the Gini coefficient and income gaps between the top and bottom 10th and 20th percentiles.<sup>7</sup> The results are mainly driven by improvements at the lower income percentiles. For example, if Lao P.D.R. could improve its financial inclusion

to the level of Thailand, it would help restore its Gini coefficient from the current level of 0.38 to 0.33—a level not observed since 2002.

## Policy Implications

The large estimated benefits of financial inclusion suggest that it should become a part of the inclusive growth agenda for Asia-Pacific countries. In fact, many countries already have or are in the process of preparing such a strategy (Appendix 8). A strategy that targets vulnerable groups—such as the rural population, low-income households, women, and remote communities—will inevitably be country-specific. A national strategy can help policymakers identify inclusion gaps, improve monitoring, strengthen national focus, and facilitate interagency coordination. A national financial inclusion strategy can also help prioritize reforms and resource allocation and exploit policy synergies, including the interactions between macro and financial inclusion policies.

<sup>7</sup>IMF (2015b) also finds a negative and significant relationship between financial inclusion and income inequality, but only on an income gap measure of income inequality.



## Interactions between Macroeconomic Policies and Financial Inclusion

As financial inclusion improves, there is a need to understand how it affects macroeconomic policies and feedback of these policies to financial inclusion. Research and policy discussions on financial inclusion have largely focused on structural issues, leaving aside macroeconomic policy issues. Recent advances in financial inclusion, however, may have an impact on macroeconomic policy effectiveness, which in turn can affect financial inclusion efforts.

### Interactions between Monetary Policy and Financial Inclusion

Financial inclusion can affect the transmission channels for monetary policy. For example, greater financial inclusion may enhance the role of interest rate in the economy and hence the interest rate channel of monetary transmission (Table 2). Broader reach of financial services can also influence the distributional impact of monetary policy, thereby affecting income equality (see Draghi 2016; Bernanke 2015; Bullard 2014; Mersch 2014; Yellen 2014).<sup>1</sup> Greater financial inclusion may also facilitate the transition to monetary policy frameworks that target price stability, such as inflation targeting.<sup>2</sup>

#### How Does Financial Inclusion Affect Interest Rate Transmission?

As financial inclusion rises, interest rates should play a larger role in economic decision making. Greater financial inclusion means that more con-

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<sup>1</sup>Various structural factors, including demographics (Karahan and Ozkan, 2013), foreign trade, and technological changes (Acemoglu 2002; Bound and Johnson 1992) have been considered as important determinants of growing inequality over longer periods of time.

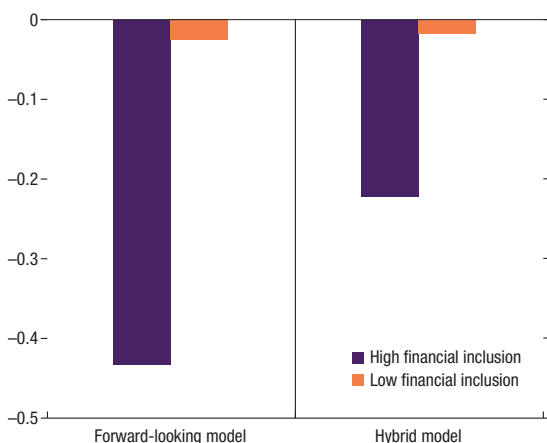
<sup>2</sup>The paper leaves aside recent research that finds that financial stability risks increase when access to credit expands without proper supervision, while countries with strong supervision could see financial stability gains from higher inclusion (IMF 2015e, 2015b).

**Table 2. Potential Channels of Financial Inclusion Impact on Monetary Policy**

	Monetary Policy Effectiveness	Distributional Impact	Monetary Policy Framework/Goals
<b>Payment</b>	Increase coverage and pace of transmission in the formal financial system	Unclear	
<b>Savings</b>	Increase response to interest rate changes	Increase impact via financial income and wealth	Smooth consumption and association with price stability as the target for monetary policy
<b>Credit</b>	Increase response to interest rate changes	Increase impact via borrowing costs	
<b>Insurance</b>		Increase impact via financial income and wealth	

Source: IMF staff estimates.

**Figure 8. Selected Asia-Pacific: Coefficient on Real Interest Rate in Euler Equation**



Source: IMF staff estimates.

higher financial inclusion, the mean estimate of the output elasticity with respect to the real interest rate is  $-0.43$ , compared with only  $-0.03$  for the low financial inclusion group (Figure 8). This indicates that real interest rate changes are much more powerful in influencing the output level in more financially inclusive countries than their less inclusive peers. The result is

sumers and producers save and borrow in the formal financial system. As a result, their economic behavior should be more sensitive to interest rates (Gali and others 2004), in the same way that financial deepening affects monetary transmission. To test this hypothesis, the sensitivity of output to real interest rate is estimated for a group of Asia-Pacific countries using two types of Euler equations—forward-looking and hybrid. The countries are divided into high and low financial inclusion groups, based on the FI index. The output equations for each group are estimated in separate panel regressions, after controlling for the level of economic development, openness, and financial depth.<sup>3</sup>

The results show that economies with greater financial inclusion are more sensitive to interest rates. For economies with

<sup>3</sup>For a detailed description of methodologies and data, please see Appendix 4 (Appendices are published in the online version of the paper). Incorporating the optimizing private agents' behavior, the output Euler equations are used to evaluate the interest rate sensitivity of output, following Fuhrer and Rudebusch (2004), Mehrotra and Nadhanael (2016), and others. The main difference between the two Euler equations is that in addition to forward-looking output gap and inflation expectations, the hybrid model also includes past output gaps to account for habit formation. Economies included in the sample are Australia, Bangladesh, China, Fiji, Hong Kong SAR, India, Indonesia, Japan, Korea, Malaysia, New Zealand, Philippines, Singapore, Taiwan Province of China, and Thailand. Countries are grouped depending on whether they are above or below the average on the financial inclusion index. The results are robust to grouping using the median.

robust to the level of economic development, trade openness, and financial depth.<sup>4</sup>

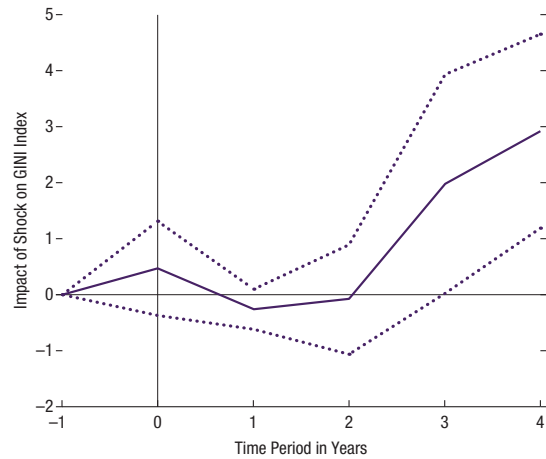
### How Does Financial Inclusion Affect the Distributional Impact of Monetary Policy?

By affecting the ability of monetary policy to stabilize inflation and output, financial inclusion can also alter its distributional effects. The various channels of policy transmission do not point to a uniform impact of monetary policy on income

distribution, leaving the identification and quantification of the combined impact to empirical analysis.<sup>5</sup> For instance, an increase in expected inflation (for example, due to expansionary monetary policy) can adversely affect lower-income and financially excluded households and firms that rely more on cash to conduct their transactions (Erosa and Ventura 2002). On the other hand, an unexpected increase in inflation, by lowering the real value of nominal assets and liabilities, can make borrowers better off at the expense of lenders, who tend to be wealthier (Doepke and Schneider 2006). Similarly, because labor earnings at the bottom of the distribution are most affected by changes in economic activity (Heathcote and others 2010), expansionary monetary policy in response to a shock can reduce inequality (Figure 9).

Monetary policy shocks can have a significant impact on inequality.<sup>6</sup> Model simulations show that a 100-basis-point unanticipated policy rate increase can lead to a medium-term (four-year) increase in inequality of 3 percent as measured by the Gini coefficient.<sup>7</sup> The results are similar to those of Furceri

**Figure 9. Impact of Monetary Policy Shock on Inequality<sup>1</sup>**  
(In percent)



<sup>1</sup>t = 0 is the year of the shock. Solid line denotes the response to an unanticipated 100 basis point increase in the policy rate. Dotted lines are 90 percent confidence intervals.

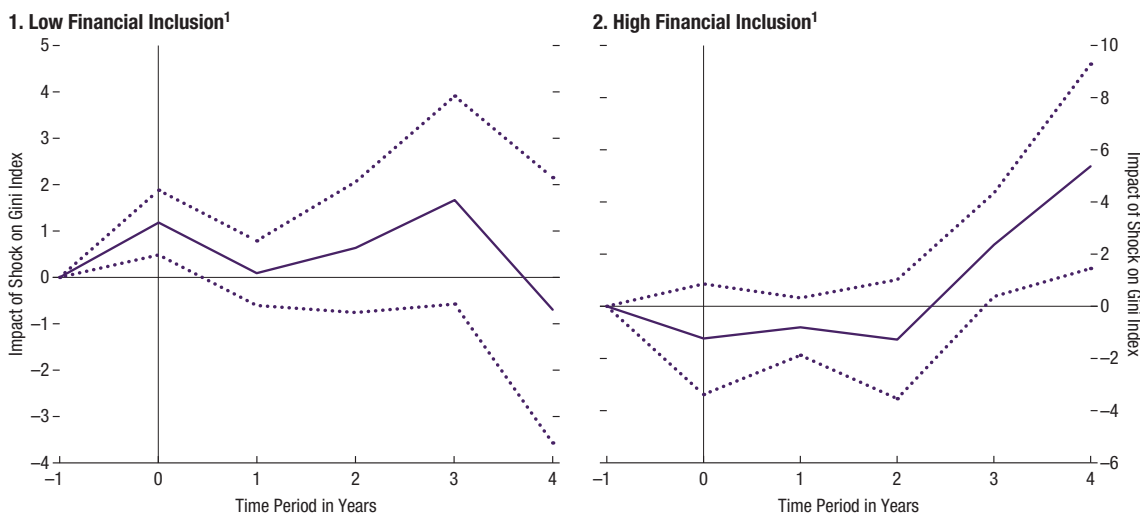
<sup>4</sup>Using the hybrid specification, the difference in magnitude becomes smaller, but remains significant.

<sup>5</sup>See Amaral (2017) for a review of main channels through which conventional monetary policy might affect inequality.

<sup>6</sup>Applying exogenous monetary policy shocks to empirical models helps avoid endogeneity problems, as both monetary policy actions and inequality can be influenced by the same macroeconomic variables. The models are estimated using a sample of 32 advanced and emerging market economies that includes 12 countries in Asia-Pacific. See Appendix 4 for more details.

<sup>7</sup>Based on the sample, the impact of monetary policy shocks on inequality is found to be asymmetric, with expansionary shocks being more powerful in reducing inequality while contractionary shocks are less powerful in increasing inequality.

Figure 10. Financial Inclusion, Monetary Policy, and Inequality



<sup>1</sup>t = 0 is the year of the shock. Solid line denotes the response to an unanticipated 100-basis-point increase in the policy rate. Dotted lines are 90 percent confidence intervals.

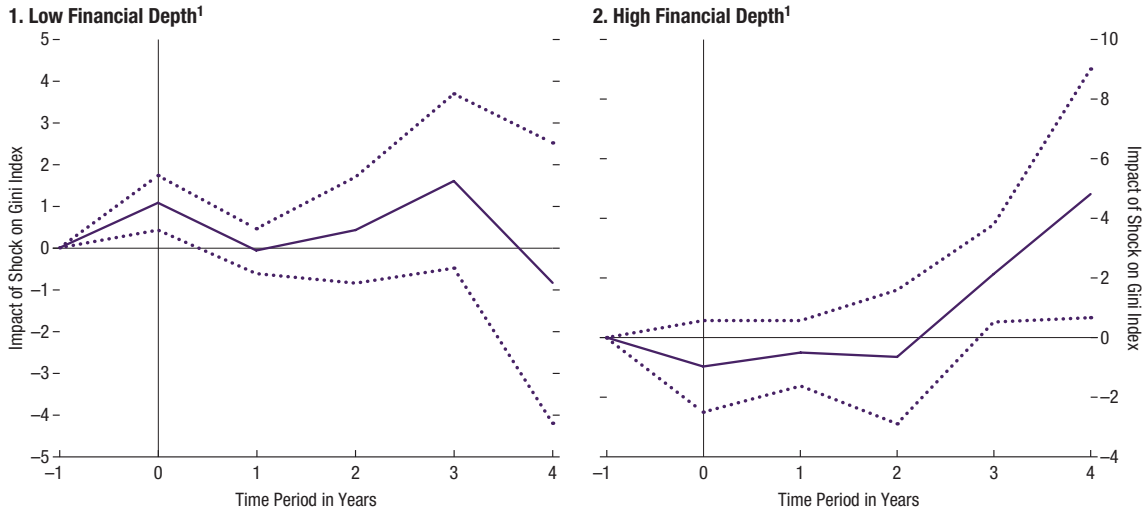
and others (2016), who find a medium-term increase in inequality of about 2.5 percent in the United States. These estimates are, however, larger in magnitude than those found by Coibion and others (2012) for the United States (1.1 to 1.5 percent).

Furthermore, the impact of monetary policy shocks on inequality increases with the level of financial inclusion (Figure 10). Reestimation of the baseline model with the FI index finds that inequality rises more in response to a contractionary monetary policy shock at higher levels of financial inclusion<sup>8</sup>; for example, inequality could rise by as much as 5 percent, as compared with 3 percent on average, in response to a 100-basis-point increase in policy rate. To put the magnitude in perspective for high financial inclusion countries, the average decline in the Gini coefficient in Asia over the past three years was about 5 percentage points. Similarly, financial inclusion amplifies the impact of an expansionary monetary policy in reducing inequality.

Financial deepening is also found to amplify the impact of monetary policy on inequality. Similar to the exercise with financial inclusion, a 100-basis-point increase in the policy rate increases inequality by about 5 percent when financial depth, measured as credit-to-GDP ratio, is high. In contrast, with low financial depth, monetary policy has an insignificant impact on inequality (Figure 11). The impact on inequality is greatest when

<sup>8</sup>The estimation includes controls for financial depth, to account for overlapping effects of financial depth and inclusion in the empirical analysis.

Figure 11. Financial Depth, Monetary Policy, and Inequality



<sup>1</sup> $t = 0$  is the year of the shock. Solid line denotes the response to an unanticipated 100-basis-point increase in the policy rate. Dotted lines are 90 percent confidence intervals.

both financial depth and financial inclusion are high, but the impact is not additive, which suggests overlapping effects.

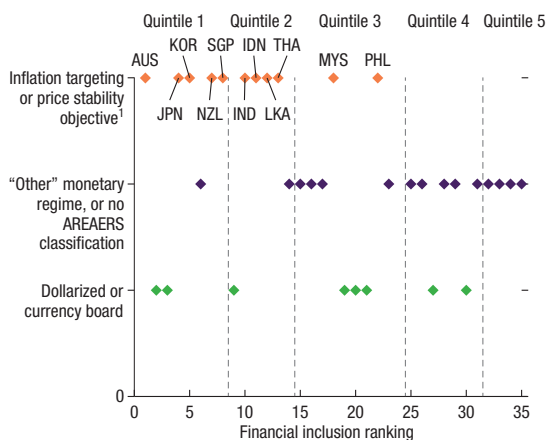
### What Is the Link between Financial Inclusion and Monetary Policy Frameworks?

Recent research finds a link between financial inclusion and inflation stabilization. Mehrotra and Yetman (2014) showed how financial inclusion affects the ratio of output to inflation variability under optimal monetary policy, by incorporating welfare-maximizing monetary policy into the model of Galí and others (2004). In their model, financially included households can use financial services to smooth consumption, and welfare is maximized when monetary policy stabilizes inflation, even at the expense of higher output variability.<sup>9</sup> With higher financial inclusion, a central bank tends to prefer stabilizing inflation over output (consistent with Bilbije 2008). Another possible reason for this could be that financial inclusion helps central banks better target inflation.

More robust regression analysis confirms that both financial inclusion and financial depth are associated with a greater preference for stabilizing inflation over output. A cross-sectional regression of the log of the ratio of output gap variance to inflation variances on financial inclusion finds that (1) higher

<sup>9</sup>A positive relationship exists between financial inclusion and a ratio of output to inflation variance.

**Figure 12. Financial Inclusion and Monetary Regimes in Asia**  
(Asia-Pacific countries grouped by financial inclusion index quintile and monetary regime)



Sources: AREAERS and staff estimates. Quintiles are as for Table 1.  
<sup>1</sup>Classified according to staff judgment.

financial inclusion has a statistically significant and positive relationship in minimizing inflation volatility over output volatility (that is, stronger central bank preference for price stability), and (2) higher financial depth (measured by credit-to-GDP ratio) is also associated with greater price stability relative to output stability. Notwithstanding the increase in the variance ratio, inflation variability and output variability both decline as financial inclusion increases, with declines also related to the overall stage of economic development.

Across the Asia-Pacific region, higher financial inclusion is linked to more active use of a policy interest rate, and the adoption of price stability and inflation objectives. Leaving the dollarized or currency board regimes

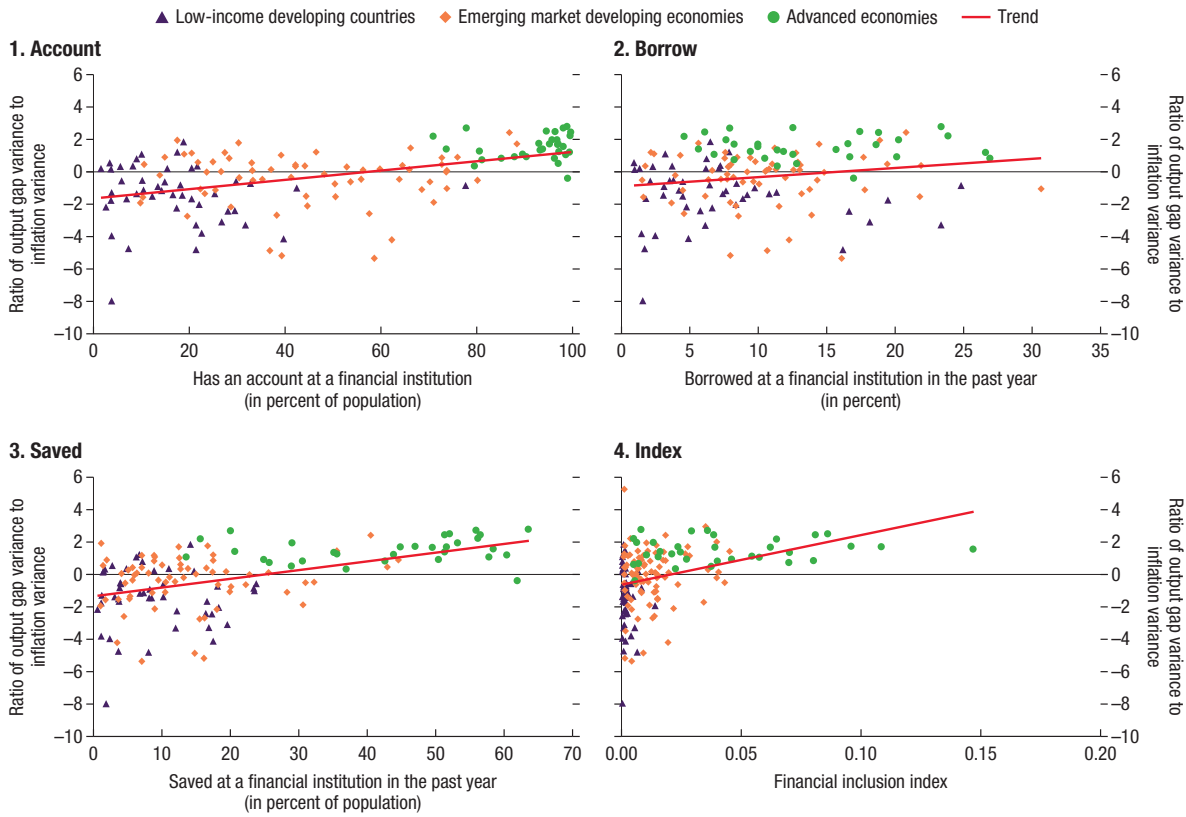
aside, countries with high financial inclusion tend also to have more formal and quantified inflation targets, and rely more on a policy interest rate as the main instrument of monetary policy (Figure 12). Countries with lower levels of financial inclusion tend to have more broadly specified monetary frameworks, which may include multiple objectives (Figure 13). Other factors, such as the level of economic development, financial depth, and institutional history, also are associated with the types of monetary frameworks. To the extent that these factors are interrelated, financial inclusion may be a factor or even a condition for transitioning to a more price-based inflation-targeting monetary framework.<sup>10</sup>

### Policy Implications

The analysis suggests that financial inclusion can enhance central banks' ability to stabilize economic activity. More effective transmission of interest rate changes from greater financial inclusion reduces reliance on more direct and quantitative interventions by central banks when conducting countercyclical operations. Even though financial inclusion accentuates the distributional impact of monetary policy, central banks' increased ability to fine-tune policy with rising financial inclusion—often accompanied by greater institutional emphasis on price stability—means that overall economic volatility can be reduced, as observed in more advanced economies. Nevertheless, care should

<sup>10</sup>To differentiate financial inclusion from financial deepening the study pays attention to indicators of breadth of access to financial services.

Figure 13. Output Gap and Inflation Variance



be taken when central banks tighten monetary policy, as its adverse impact on income distribution tends to be amplified as financial inclusion increases.

These implications of financial inclusion for monetary policy and inequality highlight the importance of structural reforms that enhance both financial inclusion and monetary policy effectiveness. In the financial sector, establishing asset registries, expanding the client coverage of credit bureaus (especially to less established clients), and enhancing payment systems are examples of such reforms. These can be reinforced by efforts in financial literacy and reporting, for consumers, MSMEs, and farmers. Other reforms, such as those that strengthen bank regulation and supervision and increase the transparency of financial products and services, can boost confidence in using banks (instead of informal markets), as well as improve monetary policy transmission. Removing financial repression and allowing interest rates to play a greater role in resource allocation would have the same effect. Finally, as discussed in the next section, fiscal policy and public financial management and macroprudential measures can complement and support structural policies as well as financial inclusion.

## Interactions between Fiscal Policy and Financial Inclusion

Financial inclusion can also affect fiscal policy effectiveness and improve public financial management. Like its relationship to monetary policy, financial inclusion affects fiscal policy and public financial management policies by changing the environment and conditions in which these policies operate. At the same time, fiscal policy can be used to improve financial inclusion.

### How Does Financial Inclusion Affect Fiscal Policy?

Financial inclusion that enhances access to payment services may also increase fiscal policy effectiveness (Table 3). For example, access to *transaction accounts* can reduce the leakage of government expenditure, as transfers and payments can be sent directly to personal and business accounts. When biometric technology is used as a tool for greater financial inclusion, as is done in India (Appendix 9), it can improve targeting by providing more accurate and detailed information about eligibility for government subsidies. On the revenue side, *electronic payment systems* help move transactions into the formal economy and reduce the costs of tax filings and compliance, thereby raising tax revenue, efficiency, and administration. Increasing availability of *insurance services* can also enhance fiscal policy by reducing the vulnerability of the poorest segments of the population and pressures on social safety nets.

Moreover, financial inclusion can affect fiscal policy effectiveness through indirect channels. A *savings account* can offer the poor a vehicle to accumulate assets that are less risky compared with cash holdings, or more liquid and divisible compared with livestock. This provides a cushion against shocks and a more secure source of self-financing, which can increase tax revenue and reduce pressure on social safety nets. Similarly, expanding access to *credit products* can help finance private expenditure on health and education and smooth consumption. In addition, a reduction in borrowing constraints for individuals and businesses can increase productive investment and growth, thereby raising tax revenue. In a similar manner, insurance services can

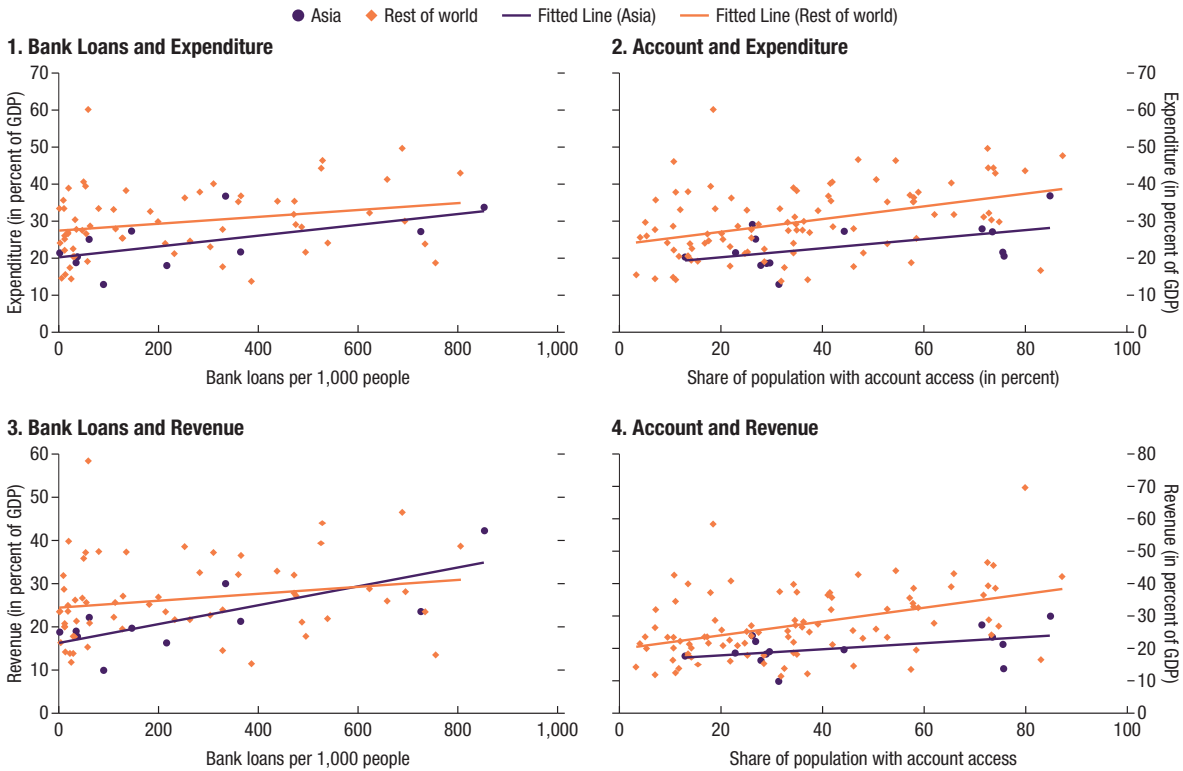
**Table 3. Potential Channels of Financial Inclusion Impacting Fiscal Outcomes**

	Expenditure	Revenue
<b>Payments</b>	<ul style="list-style-type: none"> <li>• Improve targeting</li> <li>• Reduce leakage</li> </ul>	Reduce tax avoidance
<b>Savings</b>	Reduce pressure on social safety net	Reduce tax avoidance
<b>Credit</b>	Unlock private complementary investments	Reduce credit constraints for productive investment
<b>Insurance</b>	Reduce pressure on social safety net	Encourage business activity

Source: IMF staff estimates.



Figure 14. Financial Inclusion and Fiscal Outcomes



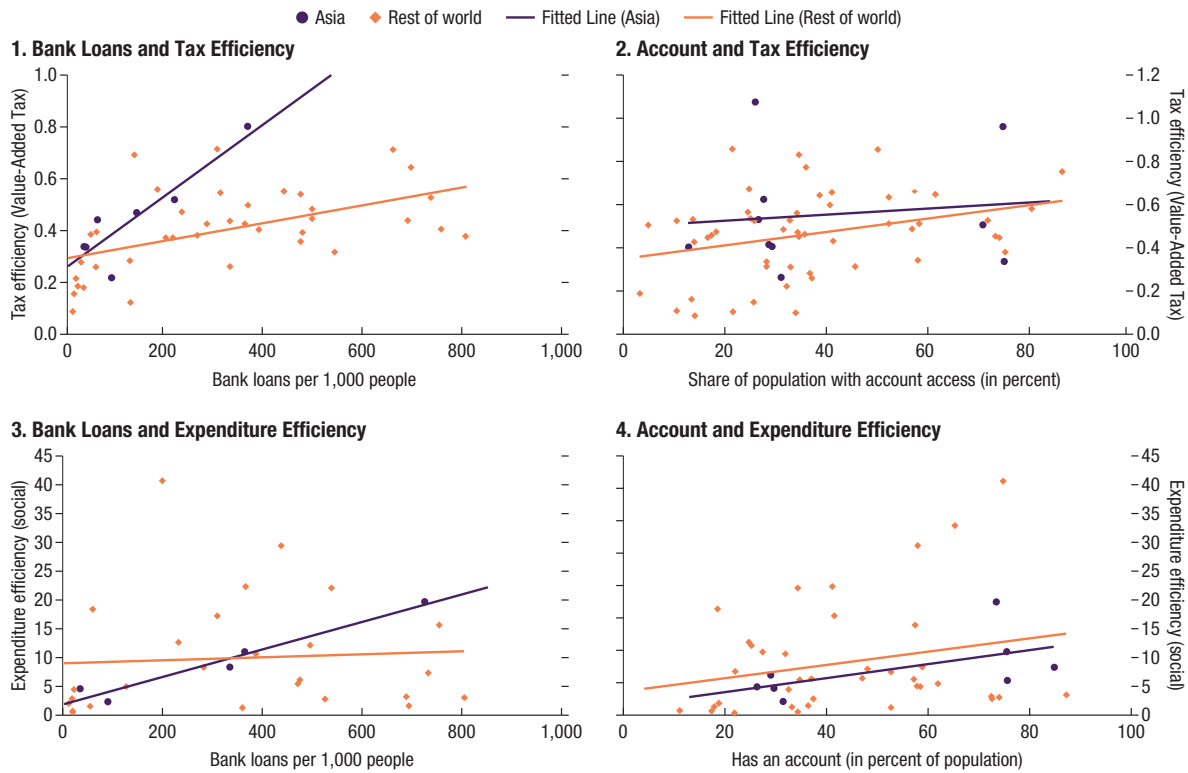
enhance risk management, thereby raising tax revenue. More broadly, financial inclusion is also likely to reduce informal and shadow economic activities and bring them into the formal economy, thus allowing them to be properly measured and taxed.

### What Is the Macroeconomic Impact of Financial Inclusion?

Simple correlation analysis shows that financial inclusion is associated with higher revenues and expenditure as a share of GDP (Figure 14). This relationship between financial inclusion and standard fiscal indicators, such as revenue and expenditure as a percentage of GDP, appears to be broadly stable. This is true whether financial inclusion is measured through greater access (share of population with bank accounts) or usage (bank loans per person). For Asia-Pacific, the relationship seems stronger with revenue than with expenditures, based on usage. Extending fiscal outcomes to include efficiency measures (Figure 15),<sup>11</sup> the results show that higher financial inclusion is associated with higher revenue (Value-Added Tax [VAT]) efficiency, although

<sup>11</sup>Revenue efficiency is measured as VAT C-efficiency (ratio of tax rate multiplied by consumption all divided by the actual tax take from VAT); social expenditure efficiency is the ratio of poverty levels (\$10 a day) to poverty spending.

Figure 15. Financial Inclusion, Revenue Efficiency, and Expenditure Efficiency



it is not always stronger in the Asia-Pacific region.<sup>12</sup> On the other hand, higher financial inclusion is also associated with higher social tax and expenditure efficiency in Asia-Pacific, compared with other regions, based on usage. These results also hold when new measures, such as electronic payments, are used to gauge financial inclusion.

More rigorous analysis suggests that financial inclusion could have a macro impact on fiscal outcomes.<sup>13</sup> Even after controlling for income level, financial inclusion, measured by ATMs or branches per 100,000 people,<sup>14</sup> is correlated with higher revenue, expenditure, revenue efficiency, and in some cases

<sup>12</sup>See the 2018 IMF Fiscal Monitor for anecdotal evidence on countries outside Asia-Pacific.

<sup>13</sup>A standard Ordinary Least Squares approach is applied, controlling for the level of income and Asia-Pacific-specific factors. There is also an interaction term to capture how the relationship in Asia-Pacific differs from the rest of the world. In addition to using the numbers of ATMs and bank branches per 100,000 people, depositors and borrowers per 1,000 people are also used as robustness checks. See Appendix 5 for more detailed description and results.

<sup>14</sup>To make the interpretation of results more intuitive, this section employs the underlying variables rather than the financial inclusion index to show changes in expected fiscal revenues, rather than the distance to frontier. The robustness of these relationships is confirmed through use of the financial inclusion index, described in Appendix 2.

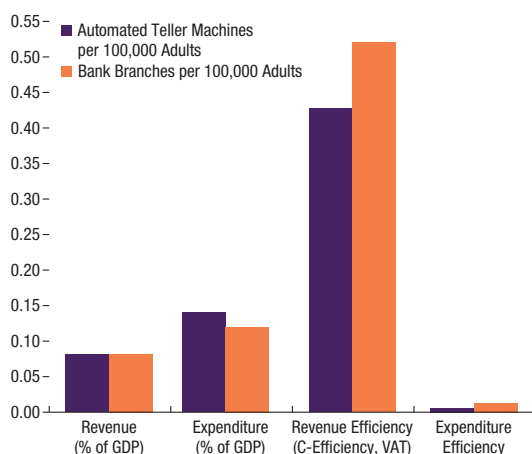
expenditure efficiency. For the Asia-Pacific region the positive relationship between financial inclusion and fiscal outcomes remains significant, albeit at a lower level than in the rest of the world (Figure 16). Robustness checks include other control variables (inflation, inequality, and financial depth) and additional measures of financial inclusion (depositors per capita or borrowers per capita). To illustrate the strength of the relationship, a country in the highest quartile of financial inclusion (based on access to ATMs and bank branches) has on average 2.4 percent of GDP higher revenue compared with a country in the bottom quartile, after controlling for the effect of income.

Financial inclusion can also amplify the fiscal multiplier, going beyond enhancing government revenue and expenditure performance (Figure 17).<sup>15</sup> According to Batini and others (2014), improving public expenditure management or revenue administration can also raise the fiscal multiplier. Therefore, financial inclusion can increase the fiscal multiplier directly through enhancing public expenditure management or revenue administration (see Table 3 for the channels and Appendix 5 for detailed description of the multiplier), which is supported by this paper's empirical analysis. For the first period effect, the results of the analysis show that the estimated fiscal multiplier for Malaysia, a country in Asia with high ATM coverage at 51 ATMs (or 81 cash-out points)<sup>16</sup> per 100,000 adults in 2015, is almost twice the size of that for Nepal, which has low coverage (9 ATMs). The cumulative effect increases to nearly three times the size for the following two periods. This finding is robust across several measures of financial inclusion.

<sup>15</sup>This finding is based on a panel regression using annual data, with controls for other factors that have been found to affect fiscal multipliers and growth, such as trade openness, exchange rate regime, inflation, level of development, financial depth, capital account openness, Gini coefficient, Asia-specific dummy variables, interaction terms, and fixed effects. The introduction of controls significantly reduces the sample size because of data limitations and the lags specifications, but qualitative outcomes are retained even though the statistical significance is reduced (see technical appendix for details on methodology and regression results). Despite the extensive use of controls, as is common in empirical estimations, the results may still have endogeneity issues, making identification of causality challenging. Therefore, all these results should be interpreted as correlations.

<sup>16</sup>Cash-out points in Malaysia comprise ATMs and cash points of agent banks.

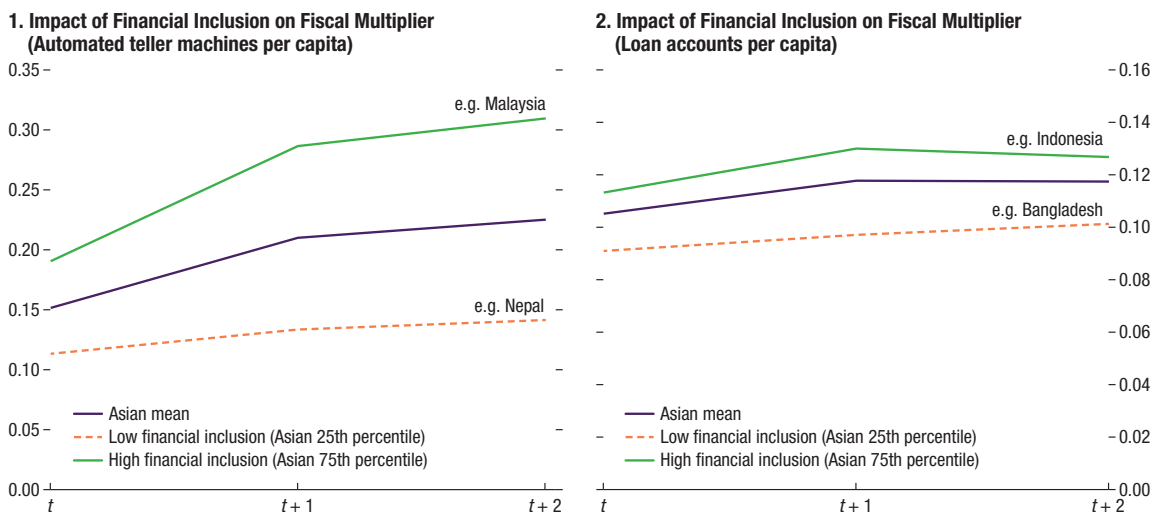
**Figure 16. Financial Inclusion and Fiscal Outcomes**  
(Marginal Impact of 1-unit increase in inclusion)



Sources: Financial Access Survey, World Economic Outlook, Revenue Performance Indicators Database and IMF Staff Estimates.

Note: VAT refers to Value-Added Tax.

Figure 17. Financial Inclusion, Revenue Efficiency, and Expenditure Efficiency



### Policy Implications

There seems to be a virtuous circle between financial inclusion and fiscal policy. On the one hand, greater financial inclusion enhances the effectiveness of fiscal policy through higher revenue collection and better targeting of government expenditure and efficiency. On the other hand, fiscal policy and better public financial management can facilitate financial inclusion. For example, better targeted and more transparent spending programs and revenue administration can strengthen confidence in the formal systems. Given the benefits of financial inclusion for fiscal policy, fiscal policy should factor in these synergies when allocating budget resources. Financial inclusion can also be integrated with health and education priorities to reduce income, regional, and gender inequality.

There is much room to experiment on how fiscal policy can promote financial inclusion in conjunction with other policy objectives. Traditionally, governments have used subsidized credit to target groups (such as farmers and MSMEs) and directed credit through banks, particularly state-owned banks, which are often given a financial inclusion mandate. However, the results have often been mixed (see the example of India in Appendix 9). Many countries have also tried other interventions, including gender budgeting, promoting micro-finance and financial literacy, and subsidizing activities such as crop insurance (Appendix 10). China, for example, has used a series of tax benefits to promote financial inclusion of micro, small, and medium-scale enterprises. These interventions have public resource implications and trade-offs that must be considered. For example, an expansion of crop insur-

ance may well increase the resilience of farmers who typically have less access to other financial services, but it is likely to incur non-negligible fiscal cost. In addition, many countries rely on technological innovations, such as digital and mobile applications, to target the less financially included. Countries could also undertake strategic partnerships to scale up outreach to the underserved, including leveraging telecommunication companies and agent bank networks to provide insurance, as well as focusing on easy-to-understand and affordable microinsurance products.

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## Impact of Technology on Financial Inclusion

### Fintech Use and Financial Inclusion: Stylized Facts

Fintech<sup>1</sup> is playing a growing role in improving financial inclusion around the world. The cost savings and economies of scale arising from fintech have made financial services commercially viable for some previously excluded groups. This is particularly true for developing countries, where telecommunications technology—such as mobile communications and internet access—has been instrumental in expanding digital financial services in recent years.

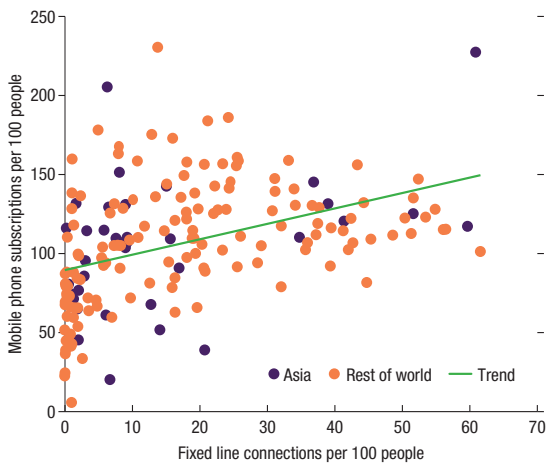
Technology access has grown rapidly in Asia-Pacific over the past decade, but the region lags behind others in *per capita* access to technology. On a per capita basis, Emerging Market and Developing countries in Asia-Pacific have lower access to technology than their counterparts in Europe, Latin America, and the small Caribbean island economies, with only sub-Saharan Africa faring worse. In the case of Pacific island countries, average per capita mobile phone subscriptions are lower than those of sub-Saharan Africa, despite recent rapid growth in mobile infrastructure. Similarly, average levels of internet access per capita are below those in other regions.

Asia-Pacific—especially Pacific island countries and low-income and developing countries—have exhibited a greater tendency to “leapfrog” in technology (Figure 18). “Leapfrogging” refers to the adoption of the latest form of a technology while bypassing one or more of its antecedents (see, for example, Fong 2009). Using the ratio of mobile phone subscriptions to fixed line subscriptions as a proxy, Asia-Pacific appears to be ahead of other regions in

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<sup>1</sup>While digital financial services take various forms and cover a broad range of activities and technology applications (including, but not limited to, digital payments, peer-to-peer lending, and Distributed Ledger Technology), a fuller description can be found in IMF SDN 17/05. This section focuses on mobile banking/money, where data are more readily available, to facilitate meaningful cross-country comparison.

Figure 18. Technology Adoption—Leapfrogging



Sources: World Development Indicators; Financial Access Survey and IMF Staff Estimates.

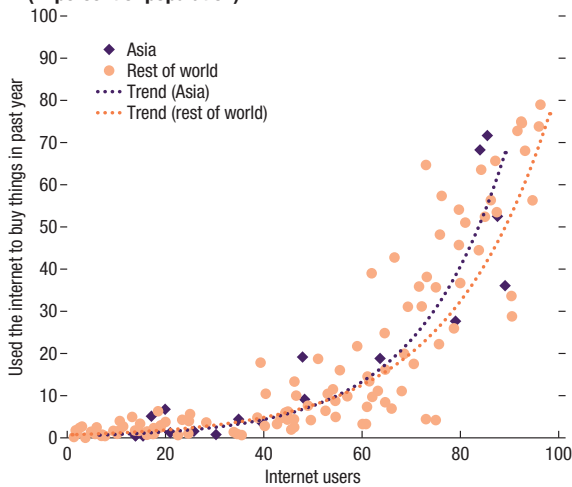
leapfrogging, except when compared with sub-Saharan Africa, where low capital stocks have likely spurred even faster leapfrogging. In Pacific island countries and some Asia-Pacific low-income and developing countries, where small market size and geographical barriers often make conventional technology too expensive, mobile phones have emerged as a viable alternative (Khor and others 2016).

However, greater access to technology does not necessarily translate into greater fintech use. While the rise in technology access has been broadly associated with greater use of digital financial services, the relationship is not linear. For example, meaningful use of the internet to make online purchases is observed only in countries with relatively

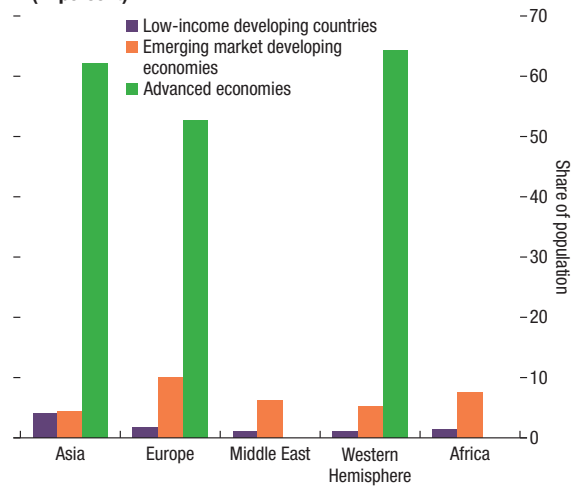
high internet penetration—at least 60 percent of the population (Figure 19). In Asia-Pacific, advanced economies initially drove the use of electronic payments, followed by Emerging Market and Developing countries, while most low-income and developing countries have just seen its beginning.

Figure 19. Technology and Financial Inclusion

1. Internet Access and Financial Inclusion, 2014  
(In percent of population)



2. Use of Electronic Payments Technology, 2011  
(In percent)



Sources: Global Findex and International Telecommunication Union.



Nevertheless, a number of Asia-Pacific EMDCs are at the forefront of some fintech use. For example, China is a global leader in mobile payments, accounting for more than half of total mobile payments in the region as of the end of 2015.<sup>2</sup> Mobile payments in China have reached levels greater than those in most developed countries. Many Chinese consumers have moved directly from cash to mobile payments, bypassing debit and credit cards. Fintech use in China has also expanded to include savings and credit products. In India, large-scale adoption of mobile payments has driven growth in the mobile payments industry over recent years. Fintech use in a number of Association of East Asian Nations (ASEAN) countries has also expanded beyond payments to include lending, insurance, investment, and mobile money.

Mobile money and mobile banking have emerged as powerful enablers of financial inclusion in Asia-Pacific low-income and developing countries and Pacific island countries.<sup>3</sup> In line with global trends, the provision of mobile money services has grown markedly in Asia-Pacific (Figure 20). The region has emerged as a major center for mobile money service providers and users, second only to sub-Saharan Africa. In Pacific island countries, where access to financial services through traditional channels is impeded by infrastructure deficiencies, greater access to mobile phones has provided for greater access to basic financial services. This was initially achieved through mobile banking, but has expanded to also include mobile money in Fiji, Samoa, Solomon Islands, and Tonga.

Despite important strides, the benefits of fintech use in Asia-Pacific are unevenly spread. Almost all segments of society in the region have benefited from greater mobile banking use, and almost all demographic groups have better access to these technologies than their counterparts in most other regions. However, the gaps in usage between rural and urban populations, and between the poorest and the richest, are strikingly large in Asia-Pacific (Figure 21). Specifically, data on mobile financial transactions show that the rural–urban gap is most stark in Asia-Pacific.<sup>4</sup> Similarly, fintech use among the poorest 40 percent is also significantly lower than those in all regions except sub-Saharan Africa.

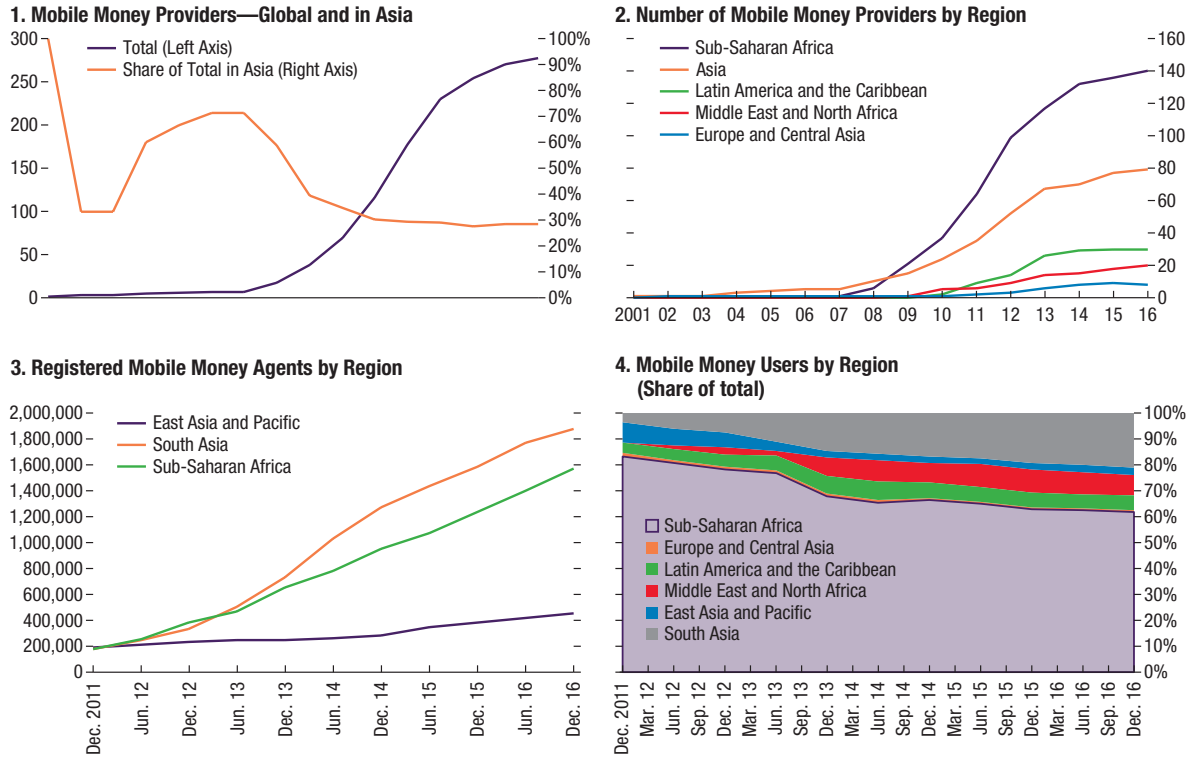
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<sup>2</sup>“China Mobile Payments Dwarf Those in US as Fintech Booms,” *Financial Times* (G. Wildau and L. Hook, 02/13/17), and “China Leads The World In On-Demand Services, Mobile Payments, Games, eCommerce—What Next?,” *Forbes Magazine* (R. Fannin 06/06/17).

<sup>3</sup>Mobile banking is distinct from mobile money (or mobile wallet). The former requires an underlying bank account while the latter does not. M-PESA and similar services in Kenya and Tanzania are examples of mobile money services.

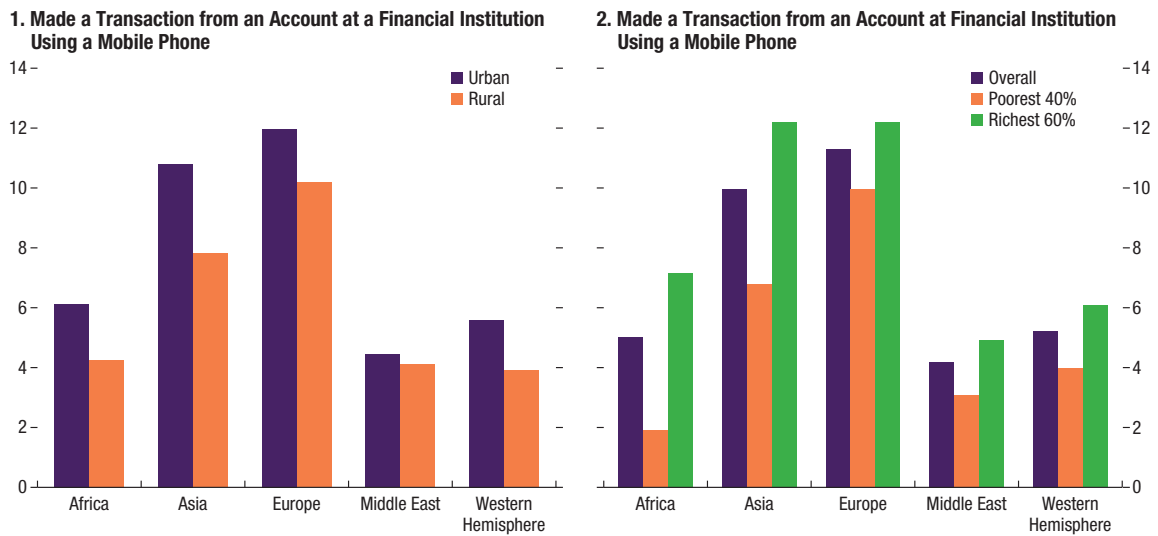
<sup>4</sup>This analysis is based on Global Findex data, which do not report numbers for the urban population separately. The urban rate of fintech use here is derived using World Bank data on the split of rural and urban populations and Global Findex data on the rate of mobile transactions for the overall population.

Figure 20. Mobile Money Availability and Use in Asia



Sources: GSMA Mobile Money Dataset.

Figure 21. Unequal Use of Technology for Financial Services



Source: Global Findex.

## The Impact of Technology on Financial Inclusion: Empirical Evidence

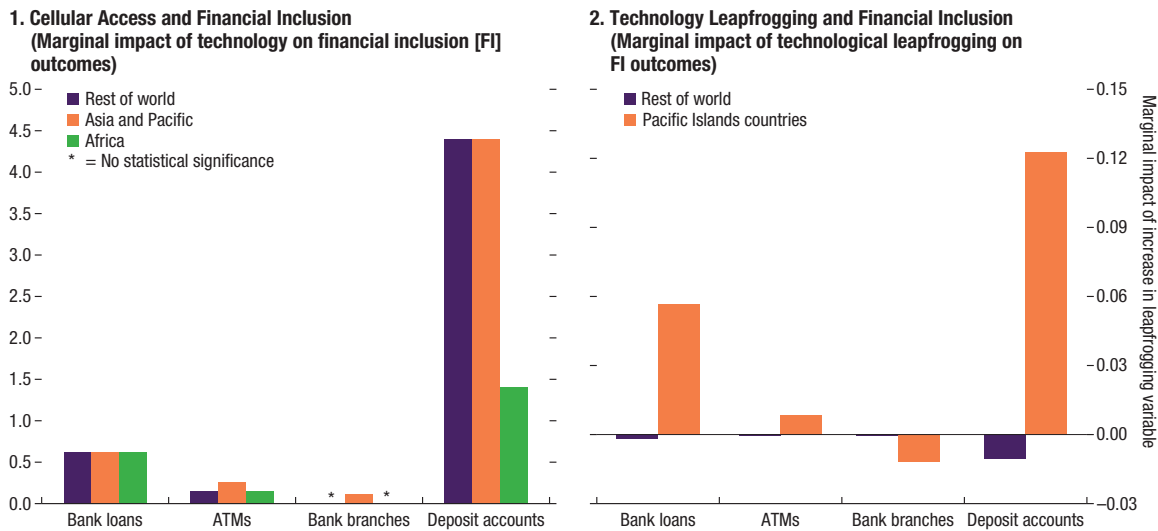
How technology affects financial inclusion is an important policy question. Data limitations preclude a direct examination of the relationship between *fintech use* and *financial inclusion*. Nevertheless, given the likely correlations between access to technology and the diffusion of digital financial services, indicators of technology access are used to help gauge the likely impact of fintech on financial inclusion.<sup>5</sup>

- *Cellular and internet access*: Overall, a statistically significant and positive relationship exists between various measures of access to technology and financial inclusion. The results suggest that a 1 percentage point increase in mobile phone access is associated with a 4-unit increase in deposit accounts per 1,000 inhabitants in Asia-Pacific (Figure 22).<sup>6</sup> A stronger effect is found for internet penetration: a 1 percentage point increase in internet access is associated with an increase of deposit accounts in Asia-Pacific by about 19 out of 1,000 inhabitants. Similarly, access to bank loans is positively related to internet penetration, with a 1 percentage point increase in the internet user share associated with 9 additional loan accounts per 1,000 people, on average. These findings confirm that broader access to technology can help expand traditional financial services, thereby achieving greater financial inclusion.
- *Leapfrogging*: Technological leapfrogging, proxied by mobile phones as a percentage of fixed line subscriptions, is negatively related to traditional financial access indicators like the number of ATMs, bank branches, and bank account per capita. Similarly, leapfrogging is also negatively correlated with the number of bank deposits and loans per capita. While leapfrogging likely reflects deficiencies in traditional banking services, these results may also suggest that leapfrogging is associated with deposits and loans moving outside of the banking system. Hence, with the rapid rise in technology, overreliance on traditional indicators of financial access might present a misleading picture.
- *Technology and Pacific island countries*: Unlike in the rest of the world, leapfrogging has a positive impact on traditional banking services in Pacific island countries. For instance, a 25 percentage point increase in the leapfrogging variable—which is equivalent to raising the mobile-to-fixed-line subscription ratio from the level in Samoa to that in Fiji—is associated with an increase of 150 and 325 bank loans and deposit accounts per 1,000 inhabitants, respectively. At the same time, leapfrogging has less impact on the number of ATMs and bank branches. Overall, these results suggest that the spread of mobile technology has improved access to tradi-

<sup>5</sup>For a description of the methodology, see Appendix 6.

<sup>6</sup>The relationship appears weaker in Africa than in other regions.

Figure 22. Link between Technology and Provision of Traditional Financial Services



Sources: Financial Access Survey; World Development Indicators; and IMF Staff Estimates.

tional banking services in Pacific island countries despite their deficiencies in financial infrastructure. Thus, technology appears to have reduced the importance of physical points of access to financial services, as shown in the case of Solomon Islands, where, for example, an unbanked person would have to travel an average of six hours to reach the nearest bank branch, and mobile banking and money offer the only practical way to access financial services. Solomon Islands’ experience also shows that mobile banking has complemented traditional channels in enabling greater use of financial services, especially for domestic remittances purposes (Solomon Islands National Financial Inclusion Taskforce 2016). Meanwhile, technology leapfrogging in some Pacific island countries has spurred a switch from cash to mobile banking, and in the case of some users, bypassing credit and debit cards.

### Policy Implications

The positive impact of fintech presented above suggests that it should be an important component of a national financial inclusion strategy. Linking financial inclusion to broader national development strategies can help secure adequate resources and align fintech strategies with other development initiatives. Moreover, a fintech strategy endorsed by all government agencies would enable policymakers to pay greater attention to emerging regulatory issues

to ensure that fintech innovations do not undermine financial stability and integrity or consumer rights (Box 1).

Continued investment in technology infrastructure will be crucial for further development of fintech and should aim to spread the benefits more broadly to close cross-country and intracountry gaps. This is particularly important for Asian LIDCs and PICs that face large infrastructure gaps. For instance, expanding infrastructure for mobile payments, as seen in Kenya and Tanzania, can overcome traditional infrastructure constraints on financial inclusion and bring substantial benefits to remote communities such as those in PICs. To expand fintech-enabling infrastructure, policymakers need to ensure strong competition in the telecom and internet industries and provide necessary support to extend telecom and internet services to disadvantaged groups.

**Box 1. Inclusive Fintech: Emerging Issues<sup>1</sup>**

The strong growth in fintech use in Asia-Pacific has benefited from a careful balance between fostering innovation and ensuring systemic stability and consumer protection. The ex post, rather than ex ante, approach to regulation has served the region well. However, as fintech products expand in depth and reach, with transaction volumes increasing rapidly (for example, China's mobile payments), it is critical that regulators keep abreast of fintech developments and forestall systemic risks. This includes those from imprudent lending practices, cyberattacks, money laundering, and large-scale technology failures. Greater efforts are needed to safeguard consumer rights and privacy. These efforts should be supported by technology literacy programs to increase the awareness of risks, as well as the benefits, of fintech. Key themes for consideration in fintech regulation include the following:

- *Establishing oversight:* Regulatory jurisdiction is normally determined by institutional structure and activity (that is, institutions engaged in the business of banking have one regulator and those that operate pension funds have another). This jurisdictional approach can make it difficult to effectively assign a regulator to fintech companies, as their structures do not map neatly onto those of conventional financial institutions. For fintech to drive inclusion it is important that all new entrants are subject to risk-based regulations. This begins with ensuring a relevant regulator is legally empowered and has the capacity to provide oversight.
- *Know your customer:* A core appeal of using technology to promote inclusion is that it is easily scalable and allows firms to innovate without the full burden of traditional regulatory frameworks under the ex post approach. However, this new approach should not dilute established Anti Money Laundering and Combating the Financing of Terrorism (AML/CFT) provisions. Peer-to-peer lending, blockchain, and electronic payments systems will require special attention, as there is significant potential for abuse. Strong regulatory frameworks and accurate recording of customer information, as well as clear guidance on what is required from correspondent jurisdictions, will be needed if fintech is to connect an increasing proportion of the world population to the financial system.
- *Consumer protection:* Widening access to finance through technology increases the risk of exploitation of vulnerable consumers. To combat this, authorities will need to combine effective regulations with efforts to ensure financial and technological literacy. In addition, governments will need to ensure resolution procedures for fintech companies that fail. This is particularly important for promoting inclusion, given the strong evidence that the memory of disorganized collapses of financial institutions acts as a barrier to inclusion for a substantial amount of time. Finally, the proliferation of financial data creates additional consumer protection challenges concerning cybersecurity.

<sup>1</sup>Based on IMF 2017.

**Box 1. Inclusive Fintech: Emerging Issues (*continued*)**

Better data on the use of financial services—including fintech use—are also crucial to strengthening regulation. Regulators need to better understand the business models of fintech companies. Given the rapid pace of change in fintech, the lack of timely and critical data to allow risk assessment poses an important challenge. In addition, conventional indicators of financial inclusion are no longer adequate to gauge the progress and impact of policy on financial inclusion, least of all the impact of technology on financial inclusion. Supplementing existing data with granular data on mobile payments, digital economy, types and value of fintech companies, and fintech transaction volumes would help policymakers refine policies targeted at fostering fintech development and, more broadly, financial inclusion.

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### Bangladesh: Building on Success<sup>1</sup>

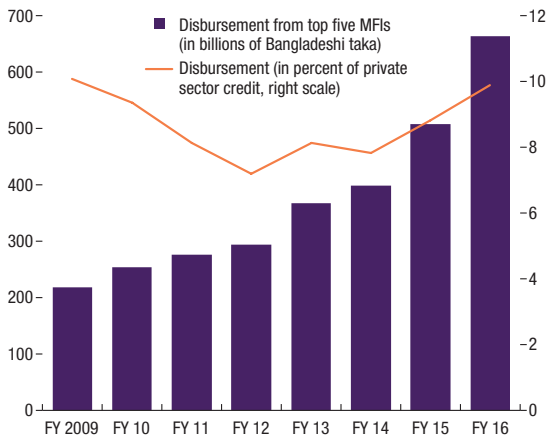
Bangladesh's efforts related to financial inclusion have focused on access to bank accounts and credit for underserved groups. Historically, Bangladesh's strategy has centered on microcredit. In 2016, outstanding disbursements by the top five micro-financial institutions (MFIs) were equivalent to 10 percent of private sector credit extended by the banking system (Figure 23). Grameen Bank's success in reducing poverty and promoting economic growth drew wide acclaim. Policy measures on financial inclusion have broadened over time, with the introduction of no-frill accounts, agent-based banking and mobile financial services, the requirement that banks open at least 50 percent of new branches in rural areas, floors on credit to the agricultural and rural sectors backed by credit refinancing lines on concessional terms and support to MSMEs and women entrepreneurs.

Bangladesh is exploring new measures to increase the effectiveness of its efforts under a draft financial inclusion strategy. This strategy chalks out an overarching framework where credit growth in priority sectors, MSME financing, gender priority, promoting access to finance in rural areas, green financing, a life cycle approach toward inclusion and insurance remain prerogatives. Leveraging technology by building a digital ecosystem to make financial services more accessible for the entire population is also in the works. However, the high level of informal finance, the low use of credit and debit cards, and more generally the low use of bank accounts persist. Applying experiences from other countries, such as strengthening the legal and regulatory framework, establishing a financial ombudsman (as was done in Malaysia), requiring the payment of providing subsidized energy via a bank account (as was piloted in Papua New Guinea), or keeping track of progress

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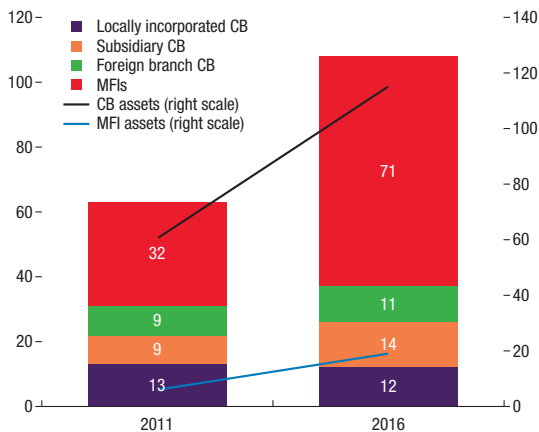
<sup>1</sup>For the full country study, see Appendix 7.

**Figure 23. Bangladesh: Disbursements—Five Largest Micro-Finance Institutions (MFIs)**



Source: Bangladesh Bank (2016).  
 Note: FY refers to “fiscal year”. Bangladesh fiscal year runs from July–June.

**Figure 24. Cambodia: Number of Institutions and Assets to GDP**  
*(In percent)*



Sources: National Bank of Cambodia, *Annual Supervision Report 2011–2016*; and IMF staff estimates.  
 Notes: CB refers to commercial banks, MFIs refers to micro-finance institutions.

and impact with the help of new tools (a financial inclusion index), could help.

### Cambodia: Containing Risks while Pursuing Inclusion<sup>2</sup>

The Cambodian government has made financial inclusion a strategic priority. Financial inclusion objectives became a part of the Financial Sector Development Strategy 2016–25. The authorities are planning to develop a National Financial Inclusion Strategy, led by the National Bank of Cambodia. The authorities recently have developed a legislative framework for credit guarantees to facilitate access to credit.

Rapid growth in micro-financial institutions has contributed to improving financial inclusion. MFIs offer affordable and customized financial products for the rural and low-income groups of the population. In 2011–16, the number of MFIs almost tripled, and the MFI-assets-to-GDP ratio increased from 4 to 20 percent, extending formal financial services to previously unbanked populations (Figure 24). In 2016, MFIs provided loans to over 2 million borrowers (20 percent of the adult population). As MFIs become a larger part of the financial system, they may become a source of financial stability risks, relying on external sources of funding more than the banking sector, and are expanding loans at a faster pace due to fierce competition within the industry.

Despite this progress, financial inclusion remains low and uneven. The share of Cambodian adult population with bank accounts (including mobile accounts) is much lower than the global average of 60 percent. Credit access is much higher than other forms of financial inclusion. In 2014 Cambodia

<sup>2</sup>For the full country study, see Appendix 8.

had one of the highest shares of the adult population (28 percent) that borrowed from financial institutions, but one of the lowest (4 percent) that saved (FinIndex 2014). Financial services seem to be skewed toward credit, with relatively lower usage of savings, transactions, and insurance, despite rapid credit growth from a low base (Figure 25).

**Figure 25. Use of Financial Products**  
(In percent of those financially included)



Source: FinScope Surveys.  
Note: EMDE Asia include: India, Lao P.D.R., Myanmar, Nepal, and Thailand.

### India: From Directed Credit to a More Holistic Approach<sup>3</sup>

India's financial inclusion approach has traditionally focused on channeling credit to weaker segments of the economy. Various schemes and policy initiatives were used to target rural areas and underserved populations, including minimum priority-sector lending requirements for commercial banks. In addition, India relied heavily on specialized development financial institutions,<sup>4</sup> intended to support industrial growth via project funding until the 2000s.

The directed credit approach had limited success in achieving the desired outcomes, with some trade-off between credit-focused financial inclusion and financial stability. While the priority-sector lending requirement has been somewhat effective in increasing credit flows to priority sectors, banks often circumvent targets by investing in other eligible instruments such as development financial institution-issued bonds. Thus, the share of long-term credit flows to the agricultural sector declined between 2006 and 2007 and 2011 and 2012. In the past, priority-sector lending has boosted financial inclusion and enterprises' access to credit, but has led to higher non-performing loans.

Recent policy efforts have taken a more holistic approach to financial inclusion, with greater use of digital technology. The priority has been to (1) rapidly expand access to formal bank accounts, (2) create incentives for boosting transactional volumes of financial products and expanding add-on products, and (3) expand the availability of credit to underserved sectors. This approach

<sup>3</sup>For the full country study, see Appendix 9.

<sup>4</sup>These institutions, established in the 1950–60s, were deemed unviable by the 1990s, and most of them were converted into commercial banks in the early 2000s.

relies on the integration of key enablers, including access to formal accounts (Jan Dhan Yojana), unique biometric identification of each citizen (Aadhaar), and reliance on mobile technologies (Mobile).

Aadhaar plays a critical role in the new approach to financial inclusion and has shown great potential in enabling more targeted and efficient financial services. The inability to reliably identify customers prompted the introduction of unique identification numbers in 2010. Aadhaar has streamlined the opening of bank accounts and enabled application of “know your customer” norms through electronic platforms. Importantly, Aadhaar-leveraged technology has been critical for curtailing misuse of subsidy rolls and financial accounts. The Aadhaar platform has provided a unique opportunity to streamline the delivery mechanism of welfare programs, support transparency and good governance, and enhance the coverage and usefulness of the India’s Credit Bureau, thereby facilitating access to financial products for Indian citizens.

## **Myanmar: Laying Foundations for Leapfrogging<sup>5</sup>**

So far, Myanmar’s financial inclusion efforts have been dominated by the operations of state-owned financial institutions in an underdeveloped financial market with an outdated regulatory regime. The state-owned Myanmar Agricultural Development Bank has been the main source of credit for the rural population. The agricultural cooperatives run by the government provide microcredit to farmers, but their resources are limited, and the cooperatives have suffered loan losses from natural disasters, particularly floods. There is a burgeoning MFI sector, but its reach has been limited due to funding constraints. Private banks have expanded rapidly in recent years, but regulations limit their lending to only one type of product—one-year overdraft loans. Bank credit tends to concentrate in large enterprises and urban centers such as Yangon.

Thus, Myanmar’s financial inclusion efforts need to go together with reforms to promote financial development and stability. The authorities have initiated a program for state-owned bank reform, but progress has been slow. Implementation of Myanmar’s banking regulatory framework has been delayed due to capacity constraints and concerns about the impact on stability.

Myanmar has prioritized mobile banking to facilitate financial inclusion. In 2013 the Central Bank of Myanmar formulated a basic regulatory framework to allow technology service providers, financial service providers, and mobile network operators to partner with banks in the provision of financial

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<sup>5</sup>For the full country study, see Appendix 10.

services. A recently updated framework also aims to ensure interoperability, agent networks (without exclusivity), know-your-customer norms, customer due diligence, and customer protection.

Myanmar's rapidly expanding usage of mobile phones holds the potential to allow the country to leapfrog in financial inclusion and financial development. With declining costs of telecommunication and rapid smartphone penetration, Myanmar should be able to bypass to some degree traditional modes of financial services delivery and accelerate financial inclusion. However, it is unclear how far a country can leapfrog without the support of physical infrastructure, such as networks of bank branches, and road and electricity distribution, as well as a solid banking system.

## **Samoa: Building Financial Infrastructure<sup>6</sup>**

The government of Samoa launched the National Financial Inclusion Strategy 2017–20 in January 2017 as part of its commitment to promote inclusive growth. There are three strategic priorities: making a wide range of financial products and services accessible to all, especially low-income segments; ensuring that financial service products are appropriately designed and priced to be widely used; and achieving strong partnership and collaboration between the private and public sectors to ensure a cohesive approach. The overall approach is designed to be market driven, with regulatory oversight by the Central Bank of Samoa.

Income level and location are the main drivers of financial exclusion in Samoa. Only about one-third of those in the lower 40th percentile of income have access to formal financial services, compared with two-thirds in the top 40th percentile. The rural population and agricultural workers are less likely to have access to formal financial services. The young population is also relatively more excluded, with 55 percent estimated to be either excluded entirely or relying on informal sources for financial services, reflecting the high youth unemployment rate (about 16 percent). Other barriers to access include high transaction costs, along with travel times to formal financial services, especially in rural areas. In addition, a strong cultural preference for cash remains.

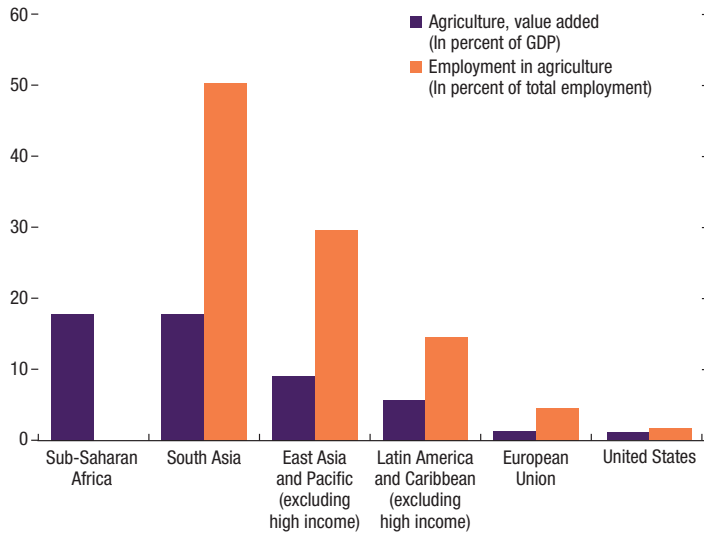
Several reforms are underway to further improve financial inclusion. The Central Bank of Samoa is working toward establishing an effective financial consumer protection regime, creating an enabling environment for inclusive insurance markets and microinsurance, integrating financial inclusion in school curricula, and addressing risks related to strains in correspondent banking relationships. Other reforms to support MSMEs include the recent

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<sup>6</sup>For the full country study, see Appendix 11.

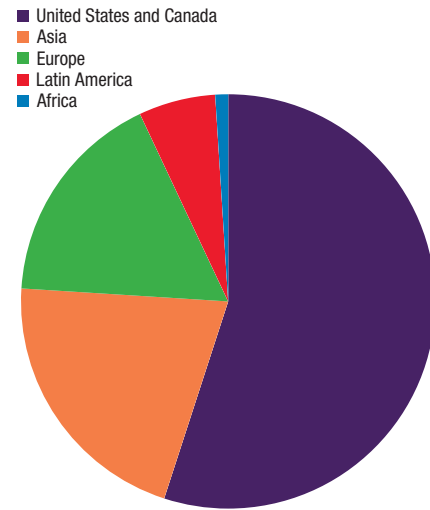
Figure 26. Overview of Agricultural Insurance in Asia

1. Employment and Output of Agriculture



Source: World Bank, *World Development Indicators*.

2. Agricultural Insurance Premiums, 2011 (Share of world total)



Source: Society of Actuaries (2015).

introduction of a movable property registry along with the authorities’ commitment to establish a credit bureau and encourage the economic use of land.

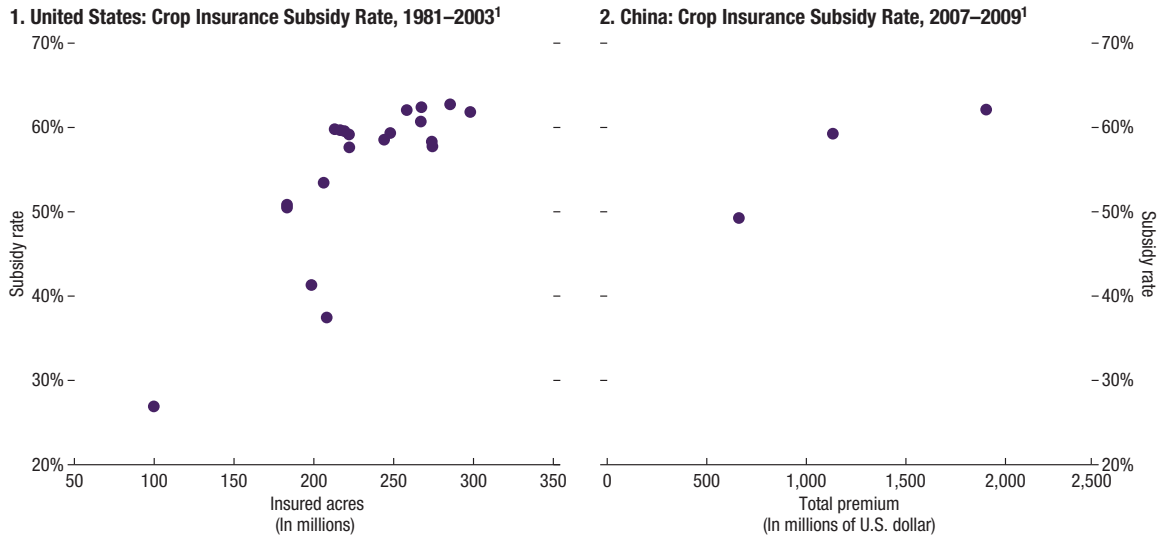
**Agricultural Insurance: Inclusion with a Fiscal Cost<sup>7</sup>**

Agricultural insurance is an important instrument for financial inclusion (Figure 26). Typically, rural populations in Asia-Pacific are less likely to be financially included, despite a relatively high share of agricultural output and employment. Agricultural insurance can help farmers hedge against adverse climate shocks to small-scale farms (Redfern, Azzu, and Binamira 2012). About half of Asia-Pacific countries have had crop insurance schemes. In terms of insurance premiums, Asia now represents the second largest market for agricultural insurance in the world, after North America.

China and India have developed two of the largest agricultural insurance schemes in the world. Both countries have highlighted these programs as financial inclusion policies to increase access to financial services. China’s Agricultural Insurance Program covers \$330 billion of agricultural production and receives \$6.3 billion in annual subsidies (China Insurance Regulatory Commission 2016). India’s Prime Minister’s Crop Insurance Program also

<sup>7</sup>For the full study, see Appendix 12.

Figure 27. Marginal Subsidy Costs Increase with Coverage



Source: United States Department of Agriculture Risk Management Agency.  
<sup>1</sup>Each observation represents the premium subsidy rate pair for a given year.

Source: Food and Agriculture Organization (2011).  
<sup>1</sup>Each observation represents the premium subsidy rate pair for a given year.

receives public subsidies, with the amount capped at 50 percent of the premium value, amounting to about \$1.4 billion in 2017–18.

Agricultural insurance is usually not commercially viable and requires substantial fiscal support. The producer loss ratios, defined as total claims divided by total premium collected from farmers, are typically closer to or larger than 1. Considering the premium covers only 25 percent of the operating costs, any loss ratio higher than 75 percent implies that government subsidies or other supports are required to keep insurers in the market (Figure 27). The marginal subsidy rate required for increasing the coverage of insurance programs rises because farmers’ demand for insurance tends to be inelastic with respect to premium (Coble and Barnett 2012).

The reasons for the unviability of crop insurance and hence the reliance of crop insurance on government support are multiple. The main reason is that crop risks tend to be undiversified, as yields can be highly correlated across farms. Therefore, it is difficult to eliminate crop risks through cross-sectional risk pooling (OECD 2009). Adverse selection and moral hazard are somewhat more pronounced for agricultural insurance because of the limited availability of actuarial information. Other reasons include low financial literacy in the rural area.

Schemes based on self-insurance are deployed in some countries as alternatives to agricultural insurance products. In Canada, for example, farmers can

open individual special savings accounts, with the government providing matching contributions to the accounts up to a limit. Farmers can withdraw from their subsidized savings accounts only when yields or income fall below a certain threshold (Coble 1995). In Australia, farmers can claim a tax deferral for the income they deposit to their savings accounts under a farm management deposit scheme. The main advantage of these schemes is that they are less prone to moral hazard and adverse selection problems, and the management costs of these schemes are typically lower than those of standard agricultural insurance schemes. However, the implementation of such schemes would require some level of financial development, which can be challenging for many developing countries in Asia-Pacific.

These discussions highlight the importance of striking a balance between costs and benefits of agricultural insurance and exploring more cost-effective approaches to achieving policy objectives. Containing costs may require greater targeting in line with the prioritization of financial inclusion. For instance, there may be a need to prioritize small farm holdings over large commercial plantations for agricultural insurance. Agricultural insurance should go together with other financial inclusion measures, such as financial literacy and access to banks accounts. Technology may also have the potential to reduce risk premiums of agricultural insurance by improving the monitoring of risk and mitigating the moral hazard problem.



## Conclusions

Asia-Pacific countries have made great progress in financial inclusion, but large disparities across and within countries remain. Large cross-country disparities reflect geography, financial sector structure, and policies, as well as income diversity in the region. The large within-country disparities disadvantage women, the less educated, small businesses, low-income households, and remote and rural populations. These gaps also extend to the access and usage of fintech, which holds much promise for advancing financial inclusion. Furthering financial inclusion in the Asia-Pacific region will require leveling the playing field for its most disadvantaged groups, particularly remote communities in Pacific island countries and in low-income and developing countries.

Asia-Pacific should pursue a more holistic approach to close the gaps in financial inclusion. This approach would build on the substantial progress over the past decades in pursuing structural reforms and expanding financial sector infrastructure, and would recognize the opportunity created by the rapid development of digital and mobile technology to reach the most remote communities (“the last mile”). A holistic approach should encompass simultaneous actions across macroeconomic, structural, technological, and financial policies, and efforts to improve financial and technology literacy and infrastructure.

- *Countries should continue to strengthen the financial infrastructure and regulations.* These reforms remain central, as they directly address impediments to financial inclusion. Efforts should continue in establishing or expanding the coverage of credit bureaus, enhancing payments systems, improving asset registries, and strengthening financial sector transparency.
- *Continued improvement in infrastructure will create the “hardware” for financial inclusion.* Countries should continue to build affordable telecommunication and internet networks that can reach rural and remote communities

as well as the urban poor. Regulatory policies should ensure strong competition in operating these networks.

- *Fintech should be a part of the financial inclusion strategy.* Fintech has significant potential for addressing the needs of excluded groups, as seen in the use of mobile payments in overcoming barriers to financial inclusion, especially for remote communities. Fintech policies should aim to reduce gaps in access to and usage of fintech-enabled services and avoid the digital divide. Fintech regulation needs to strike the right balance between fostering innovation and ensuring systemic stability and consumer protection. Strengthening anti-money laundering regulations will also be important.
- *Improving financial and technology literacy is a priority.* The focus should be on MSMEs, women, and low-income and rural populations. Financial education should include fintech innovations to keep up with technological progress.
- *Better and broader data on financial inclusion will strengthen monitoring and policy design.* Surveys should not substitute administrative data collection, which may better capture the rapid growth of fintech and other dimensions of financial inclusion, such as gender and income distribution. Countries should also explore the feasibility of unlocking big data to better understand consumer needs, develop tailored financial services, and better assess potential borrowers' creditworthiness.<sup>1</sup>
- *Design policies need to consider interactions between macroeconomic policy and financial inclusion.* Higher financial inclusion can increase the effectiveness of interest rate policy as well as amplify its distributional impact. Similarly, greater financial inclusion can also enhance the effectiveness of fiscal policy and help create space for needed public spending. On the other hand, fiscal policy can help promote financial inclusion through targeted assistance.

Asia-Pacific's experience suggests that each country should adopt its own holistic approach to financial inclusion. Countries should encourage social experimentation, much in the same way in which Bangladesh pioneered its microcredit approach and some of the East African countries have popularized mobile payments. An effective holistic approach also calls for joint efforts by central banks, finance ministries, regulatory bodies, telecom regulators, and education authorities, in partnership with the private sector.

The IMF can continue to support financial inclusion efforts in Asia-Pacific through its policy advice and capacity development. To assist countries, the IMF has made financial inclusion an integral part of its policy advice and capacity development. Further work is needed to strengthen the IMF's toolkit

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<sup>1</sup>Malaysia, for example, has developed an online Separately Managed Account financing aggregator, which enables digital submission of documents, facilitates multiple financing applications seamlessly, and reduces the information asymmetry between banks and Small-Medium Enterprises.

for financial inclusion analysis through a better understanding of the roles of macro, structural, financial, and technology policies. At the same time, the IMF and other development partners should continue to collaborate closely in providing tailored policy advice and capacity development.

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