Analysis and Advice on Capital Account Developments: Flows, Restrictions and Policy Toolkits

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Analysis and Advice on Capital Account Developments: Flows, Restrictions, and Policy Toolkits

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<div align="center">Contents   Page</div>

ABBREVIATIONS

AE	advanced economy
AREAER	Annual Report on Exchange Arrangements and Exchange Restrictions
AUM	assets under management
CFM	capital flow management measure
CT	capital transaction
EBA	external balance assessment
EM	emerging market
EMDE	emerging markets and developing economies
FDI	foreign direct investment
FS	financial sector
FX	foreign exchange
G20	Group of Twenty
GDP	gross domestic product
GFC	global financial crisis
iMaPP	Macroprudential Policy Index (IMF)
IV	Institutional View on the Liberalization and Management of Capital Flows
MCM	Monetary and Capital Markets Department (IMF)
MPM	macroprudential measure
OECD	Organization for Economic Cooperation and Development
PA	appropriateness of policy responses
WEO	*World Economic Outlook*

I. INTRODUCTION

1.   The onset of the global financial crisis (GFC) in 2007–08 led to a sharp decline in trade and capital flows, which provoked fears that, as during the Great Depression, there would be a long-lasting rupture in global integration. While the worst did not come to pass, the GFC and the policy responses that it engendered have had a long-lasting impact on the extent and nature of capital flows. The dynamics of capital flows have also been influenced by long-run trends—including a shift from bank-based to market-based finance and a secular decline in real interest rates—which have continued over the past decade and interacted with the post-GFC environment. Against this background, the evolution of countries' attitudes toward capital account liberalization, global integration, and the use of capital account measures remains a subject of considerable interest as the IMF has provided advice on capital account policies.[1] Large swings in capital flows following the COVID-19 pandemic have reinforced this debate.

2.   At the IMF, the desire to sustain global integration in the aftermath of the GFC has been combined with increased recognition of the complex challenges of handling volatile capital flows. As a result, over the past decade, the Fund has substantially overhauled its frameworks to guide its advice, leading to several initiatives, among them the adoption of an Institutional View on Liberalization and Management of Capital Flows (IV) (IMF, 2012a) and an Integrated Surveillance Decision (IMF, 2012b), a framework for macroprudential measures (IMF, 2014), and a metric for assessing reserve adequacy. And ambitious efforts are now underway to develop an Integrated Policy Framework to bring together analysis of different policy instruments to guide the Fund's advice in this area.

3.   This paper discusses three sets of issues related to Fund analysis and advice on capital flows as contributions to the IEO's evaluation of IMF advice on capital flows (IEO, 2020):

- **Developments in international capital flows:** How have capital flows evolved since the global financial crisis compared to the earlier decade?

- **Monitoring and analysis of capital account measures:** How does the Fund assess the openness of capital accounts? Do these measures suggest that countries have continued to liberalize since the GFC?

- **The policy toolkit to deal with capital flow volatility:** What policy instruments have emerging market economies (EMs) used over the past decade to address capital flow volatility? To what extent have countries relied on capital account measures versus other instruments?

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[1] This paper uses "capital account restriction" or "capital account measure" interchangeably as a broad category of policy interventions that directly affect capital account transactions. As explained in Sections III and IV below, other terms such as "capital control" and "capital flows measure" are narrower concepts.

4.   On the first set of issues, several key facts emerge from the analysis. First, while post-GFC capital flows to emerging markets and developing economies (EMDEs) are not distinctly more volatile than those pre-GFC, capital inflow surges and reversals remain a fact of life for policymakers, requiring constant attention and, often, quick action. Second, much of the analysis of drivers of these flows continues to be cast in terms of "pull" and "push" factors and sorting out the respective roles of the drivers remains difficult. In addition to the "pull" versus "push" terminology, the changing structure of the global financial system—the "pipes" through which capital flows across borders—is also relevant to understanding the dynamics of capital flows.

5.   Turning to the second set of issues, the IMF has played the central role in compiling basic data on countries' use of capital account measures, while outside researchers have taken the lead in compiling the indexes used to analyze trends in countries' use of such measures. Characterizing how open countries are and analyzing recent trends remains challenging, despite work by IMF staff and other researchers on the issue.

6.   On the third set of issues, the review of country practices shows that countries tend to use a variety of policy instruments to cope with capital flow volatility. In response to surges, policy responses typically go in a "warranted" direction (i.e., consistent with the direction advocated by the Fund's IV). Moreover, such restrictions appear to be typically used as complements, rather than substitutes, for macroeconomic adjustment. This suggests that the concern that countries may be inclined to overuse capital account restrictions, or to use them in place of other means of adjustment, has not been observed in practice. Instead, policymakers have generally favored an integrated approach that involves adjusting multiple instruments simultaneously to meet their policy objectives.

7.   The paper is organized as follows. Section II describes developments in capital flows including in the immediate aftermath of the COVID-19 shock and provides a brief assessment of IMF work in this area; further assessment is given in the background paper by Towe (2020), which evaluates the IMF's multilateral surveillance work on capital flows. Section III describes work by IMF staff and outside researchers on the measurement and monitoring of capital account liberalization and restrictions, providing an assessment of the Fund's work in this area. This analysis is based on both direct sources and interviews of IMF staff, authorities and document reviews.[2] Section IV discusses the classification of capital flow management measures (CFMs) introduced in the IV framework, and how this classification relates to the broader concept of capital account measures, as well as to other policy measures like macroprudential measures (MPMs). Section V describes policies that countries have been using to deal with capital flow volatility. Notes on methodology are provided in Annex I.

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[2] The interviews and document review were largely completed before the onset of the COVID-19 crisis; while the study has been updated to report on recent developments, it does not seek to evaluate the recent experience.

II. DEVELOPMENTS IN INTERNATIONAL CAPITAL FLOWS

Magnitude and composition

8.   Gross international capital flows rose significantly from the mid-1990s to the first half of the 2000s, both in EMDEs and in advanced economies (AEs)[3] (Figure 1). The GFC caused gross flows to drop sharply in 2008 but they rebounded in 2009. For AEs, gross flows fell again in late 2011, as the crisis in the euro area periphery intensified. For emerging markets (EMs), non-resident inflows recovered strongly over 2010–12, boosted by extremely easy monetary policies among the AEs, as well as by strong economic performance in emerging markets (Figure 2). However, non-resident inflows have suffered a series of reversals since then—including during the "taper tantrum" in 2013, the China risk shock in 2015, and a broader EM stress shock in 2018. Resident outflows have also been volatile, with surges in 2015 and 2018.[4] In early 2020, capital flows to EMDEs experienced a further, extraordinarily fast and sharp, reversal following the health and economic crisis caused by the COVID-19 pandemic (Batini, 2020).

Figure 1. Gross and Net Cross-Border Capital Flows

Source: IMF, International Financial Statistics.
Notes: Gross flows are computed as the absolute sum of non-resident inflows and resident outflows. Data are quarterly over the period 1980Q1:2019Q1.
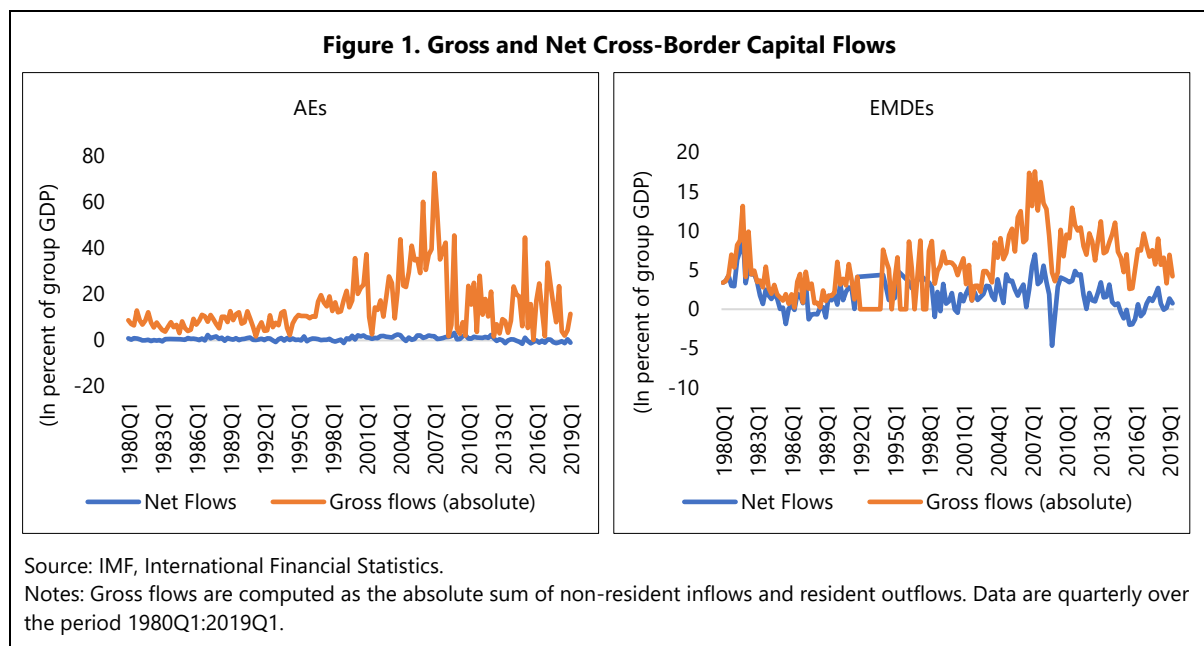
9.   Since the GFC, there has been a significant shift in the composition of capital flows to emerging markets. Bank-intermediated flows have fallen, as large global banks have deleveraged and curtailed their cross-border operations in response to higher risk weights and tighter regulatory oversight. For many countries, portfolio flows into equity and debt markets have

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[3] Gross flows are defined as the absolute sum of non-resident inflows and resident outflows. Net flows are defined as non-resident inflows minus resident outflows. Note that both non-resident inflows and resident outflows are themselves net concepts, since during any period residents and non-residents may be bringing capital into and out of a country.

[4] Within EMDEs, low-income developing economies have displayed a distinct capital flow dynamic which tends to be masked when analyzed in combination with EMs (Araujo and others, 2015, 2017).

become an increasingly important source of financing, as local bond and equity markets have grown. Portfolio flows have been facilitated by the increasing role of institutional investors and the widespread use of index funds and exchange-traded funds, helping to expand the investor base for EMs. Although foreign direct investment (FDI) has remained the main source of external financing, it appears to have been increasingly driven by cash management and tax considerations, rather than by greenfield investments.

10.   While capital flows to EMs continue to be dominated by flows from AEs, transactions between emerging market and developing countries have increased in importance, becoming significant in terms both of these countries' gross domestic product (GDP) and of their overall absorptive capacity (OECD, 2011; Carney, 2019). In particular, Chinese outward FDI and related external lending have risen sharply relative to other sources of FDI (Patnaik and Prasad, 2020).

Figure 2. Capital Flows to Emerging Markets

Legend:
- Non-Resident FDI
- Non-Resident Portfolio Debt
- Resident Capital Flows
- Changes in International Reserves
- Non-Resident Portfolio Equity
- Non-Resident Other
- Net Capital Flows

Source: IMF, International Financial Statistics.
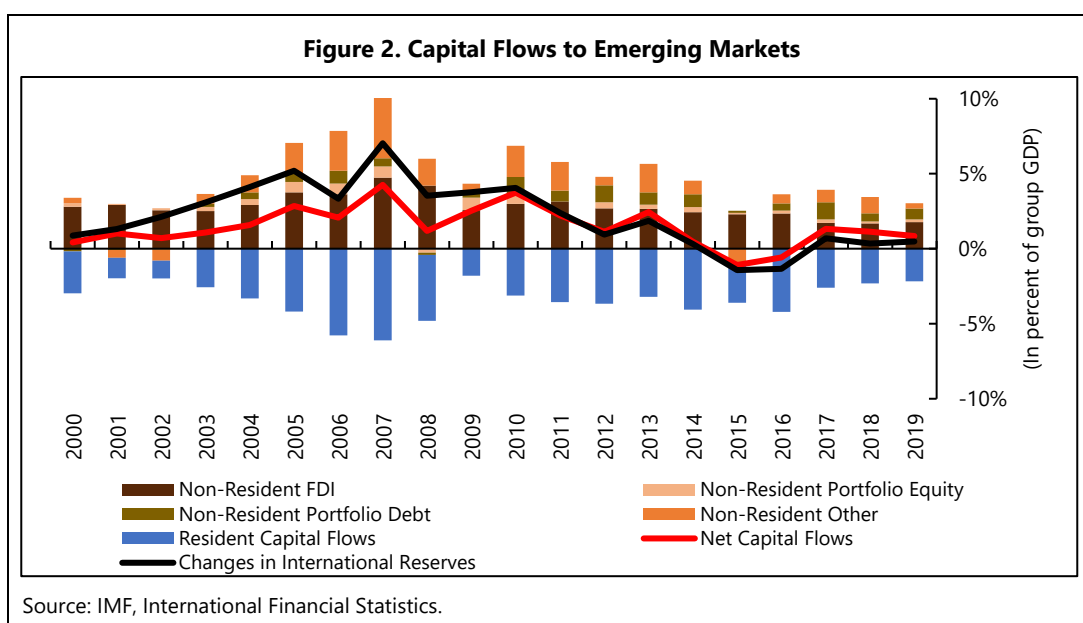
Volatility

11.   Capital flows remain volatile for both AEs and EMDEs, although net capital flows to EMDEs have typically been more volatile than those to AEs, because resident flows tend to diminish the impact of non-resident flows in the latter group more than in the former (Pagliari and Hannan, 2017). After a spike in the aftermath of the GFC, and especially during the 2013 "taper tantrum," capital flow volatility in EMDEs returned to pre-GFC levels, where it remained until the COVID-19 crisis (Figure 4). However, capital flows to some individual EMs continued to be subject to surges and reversals, exacerbated by the tendency in EMs for resident flows to reinforce rather than offset non-resident flows. When the COVID-19 pandemic broke out in 2020, capital flow volatility surged to levels not seen since the Great Depression in the 1930s, according to synthetic volatility indexes extended back to the beginning of the 20th century (Reinhart, Reinhart, and Trebesch, 2020).

Figure 3. Capital Flows to EMs at the time of the COVID-19 Shock

Non-Resident Portfolio Flows to EMs

Overall Net Capital Flows to EMs
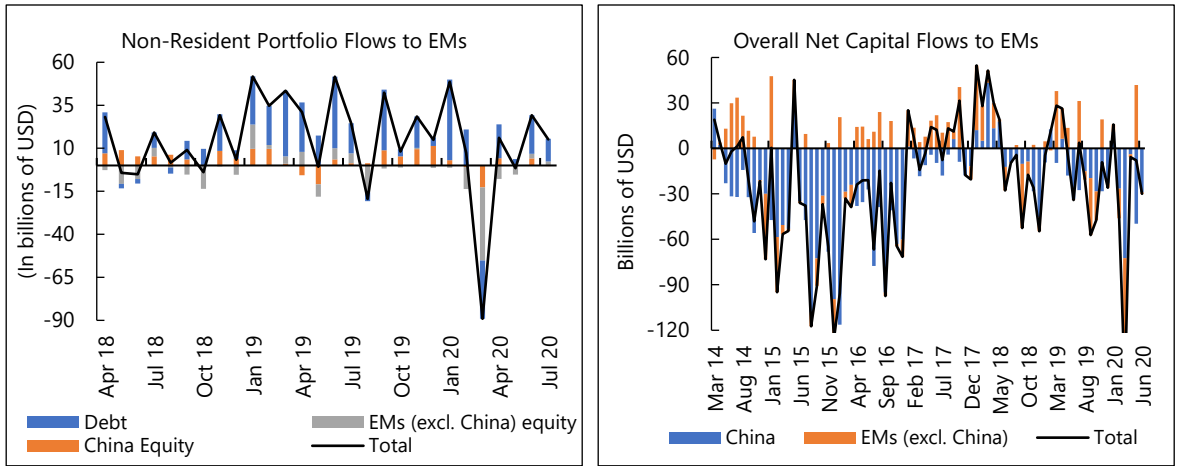
Source: Institute of International Finance, *Capital Flow Tracker*, August 2020.
Note: Non-resident portfolio flows are a subset of overall net capital flows, which include all types of flows from both residents and non-residents—covering portfolio flows, banking flows, direct investment, and other components of the financial account in a nation's balance of payments.

12.　　While different types of flow exhibit different degrees of volatility, in general net capital flows tend to be procyclical (Pagliari and Hannan, 2017) (Figure 5).[5] Traditionally, FDI flows have been more sticky than other sources of flows, and thus they retain a more predictable volatility pattern and decline by smaller amounts in both country-specific sudden stop and global stop episodes. However, as the composition of FDI shifts, these flows too are becoming more volatile.

Figure 4. Volatility of Capital Flows in EMDEs
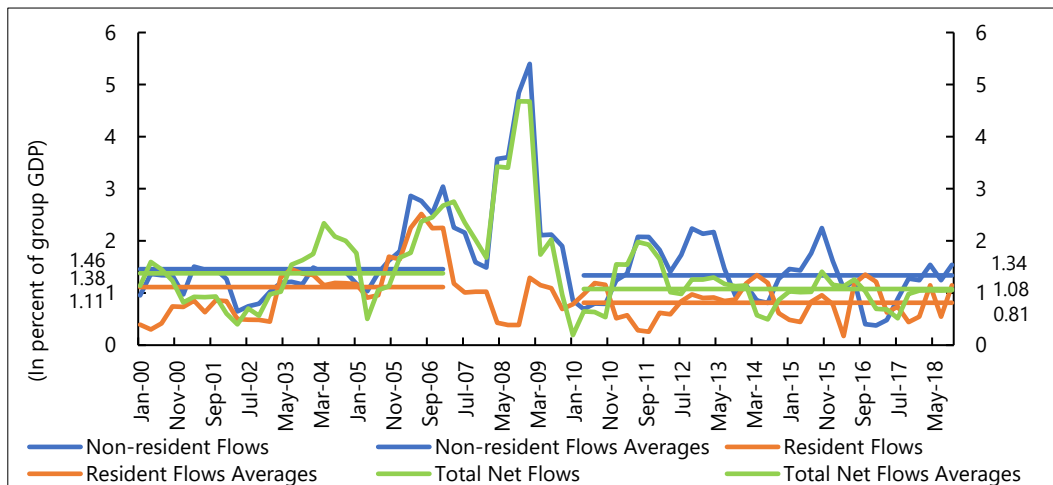
Source: Pagliari and Hannan (2019 update of 2017 Figure 6) using IMF International Financial Statistics.
Note: Estimated standard deviations produced by an ARIMA (1,1,0) model, expressed in percent of group GDP.

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[5] Data to update Figures 4 and 5 did not yet cover the period of the COVID-19 shock at the time of writing.

Figure 5. Volatility of Non-Resident Inflows for EMDEs by Components

Source: Pagliari and Hannan (2019 update of 2017 Figure 7) using IMF International Financial Statistics.
Note: Estimated standard deviations produced by an ARIMA (1,1,0) model, expressed in percent of group GDP.

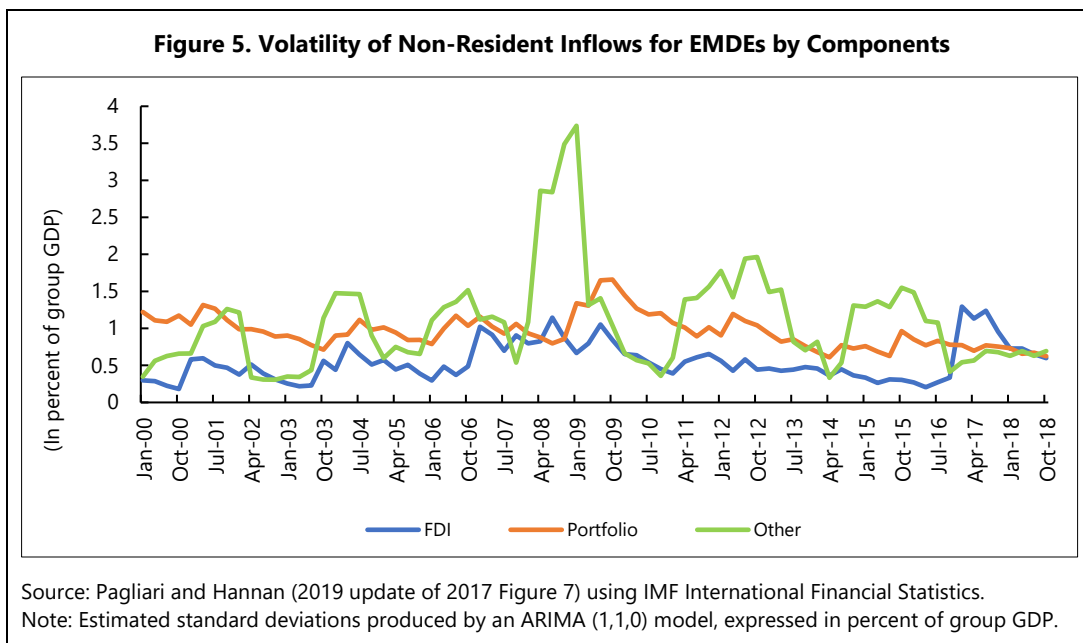13.   Within non-FDI flows, portfolio debt and bank-intermediated flows remain the most volatile component and were the main drivers of the large swings in volatility observed during and in the aftermath of the GFC and during the initial months of the COVID-19 crisis (Figure 5).[6] Bank-intermediated flows, which rose in the mid-2000s, are especially volatile and tend to decline most sharply during country-specific sudden stops and global stop episodes, as they did in 2008 due to the GFC and during the 2013 "taper tantrum" (Eichengreen, and others, 2018). While these flows have become less important as a source of net financing for many EMDEs, for some such as China they are still the dominant form of inflows.

Drivers of capital flows: "push," "pull," and "pipes"

14.   The trends just described and their disruptive effects in the aftermath of the GFC revived interest in what drives uneven capital flow dynamics to emerging markets (Reinhart and Reinhart, 2009; Cardarelli and others, 2010; Forbes and Warnock, 2012). However, answers to this question continue to be debated. Some authors have stressed the importance of "pull" factors, such as divergences between EMs and AEs in terms of differences in country-specific macroeconomic performance and risks (Hooper and Kim, 2007; Bruno and Shin, 2015a; Daude and Fratzscher, 2008). Others have emphasized the increased importance of "push" factors, in particular the reliance on exceptionally easy monetary policy in the United States, along with the increasingly disproportionate role of the U.S. dollar in the international financial system vis-à-vis the share of emerging markets' GDP in the global economy (Rey, 2015; Davis and others, 2019;

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[6] Building on Broto and others (2011), Pagliari and Hannan (2017) analyze the evolution of volatility of flows for emerging and developing markets since 1970 using a variety of volatility measures.

Carney, 2019), as well as change in global risk appetite (Broner and others, 2013; Bruno and Shin, 2015b; Koepke, 2019*)*.

15.   Beyond the traditional "push" and "pull" analysis, increasing attention is being paid to the substantial changes that have taken place over the past two decades in the structure of the global financial system, that is the "pipes" through which capital flows between countries. In particular, the rise of market-based finance and the growth of assets under management (AUM) in both advanced and emerging markets are believed to have exacerbated the risks of sudden stops and sharp capital reversals (Carney, 2019; Ramos-Francia and García-Verdú, 2015; Li and others, 2018). Two trends pose particular concerns. First, global AUM have grown dramatically, rising from around US$50 trillion a decade ago to US$80 trillion in 2017[7] and accounting for all the increase in foreign financial flows to emerging markets since the GFC.[8] Second, within AUM, the growth of open-ended funds that implicitly promise investors instant access to their funds despite holding potentially illiquid assets has generated new vulnerabilities, especially among G20 countries—e.g., the possibility of amplified systemic risk based on unique factors such as herding and liquidity mismatches, which could create fire-sale scenarios that negatively impact financial markets (Carney, 2019).

16.   At the same time, the regulation of international financial markets has continued to evolve. Bank regulation in particular was subject to a major overhaul after the GFC. Basel III regulations have strengthened capital requirements by widening the types of risks being covered, introducing a non-risk-based leverage ratio, and constraining the capital relief that banks could achieve by using their own models to calculate risk weights (IMF, 2018a). Moreover, the new regulations added capital cushions (e.g., the countercyclical capital buffer, capital conservation buffers, and capital surcharges for systemic banks). Together these modifications have increased the cost of bank-based cross-border intermediation. Less progress has been made in strengthening the regulation of securities markets, although the Financial Stability Board and the International Organization of Securities Commissions are paying more attention to the systemic concerns that the rapid development of these markets poses.

III.   CAPITAL ACCOUNT MEASURES: DATA PROVISION AND MEASUREMENT

Data on capital account measures

17.   While the IMF does not have formal jurisdiction over members' use of capital account measures (unlike current account and exchange rate restrictions), since 1950 it has systematically collected data on these measures through its Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). The AREAER draws on information available to the IMF from many sources, including information reported by member countries in accordance with Section 3

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[7] See Boston Consulting Group estimate of global AUM in Global Asset Management 2018, Exhibit 1.

[8] Carney (2019).

of Article XIV of the IMF's Articles of Agreement, annual surveys, and information provided in the course of IMF staff visits to member countries. It is the only publication in the world that records and classifies information on capital account measures in a systematic way, both consistently over time and covering the Fund's broad membership. As a result, the AREAER plays a unique role in the measurement and analysis of capital account measures (Box 1). Indexes of capital account openness prepared by the IMF and other researchers are all based on this data source, even as they reflect different approaches depending on their purpose.

Box 1. The Annual Report on Exchange Arrangements and Exchange Restrictions

Since 1950, the Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER) has provided an annual description of foreign exchange arrangements, exchange and trade systems, and capital account regulations of all IMF member countries. In general, the AREAER includes information as of December 31 of the reporting year, which is the year preceding the publication year.

The AREAER distinguishes across types of transactions according to the residency of the buyer or the seller (these are measures that discriminate based on residency of the transactor). Within each of these broader categories, the AREAER identifies whether the transaction represents a purchase or a sale, and the currency in which transactions are denominated.

The broad category "capital transactions" (referred to as "CT") is broken down into the following categories of transactions upon which restrictions could be placed: (i) capital and money market instruments; (ii) derivatives and other instruments; (iii) credit operations; (iv) direct investment; (v) liquidation of direct investment; (vi) real estate transactions; and (vii) personal capital transactions. In addition to these broad CT categories, the AREAER also reports controls on resident bank accounts abroad and non-resident bank accounts in the country which are also CTs. The sections on resident and non-resident accounts provides information on restrictions on the currency denomination of the accounts, e.g., if residents are permitted to keep foreign exchange (FX) accounts in local banks.

The AREAER also includes a section on regulations specific to the financial sector (usually referred as FS), that covers controls imposed on transactions such as borrowing abroad, lending to non-residents, purchases of locally issued securities denominated in foreign exchange, and regulations pertaining to banks' and institutional investors' investments. For certain transactions this section also distinguishes between transactions denominated in domestic vs. foreign currency, for example with respect to reserve requirements on financial institutions' liabilities or banks' lending locally in FX.

For each asset category, there are four categories of controls: two on capital inflows, including "purchase locally by non-residents" and "sale or issue abroad by residents;" and two on outflows, which are "purchase abroad by residents" and "sale or issue locally by non-residents." The real estate category includes the inflow transaction category and the outflow control transaction categories and "sale locally by non-residents." There is only a broader classification of inflow or outflow restrictions for the three categories of financial credits; commercial credits; and guarantees, sureties, and financial back-up facilities. Direct investment includes the categories of restrictions on inflows, on outflows, and controls on the liquidation of direct investment, which captures controls on the reversal of capital inflows or outflows from the liquidation of direct investment abroad or domestically in the country by non-residents.

The information from the AREAER is presented in three columns; the first listing the asset subcategory; the second containing a "YES" (that is, a restriction is in place), a "NO," "N.A." for information not available, or "N.R." for non-regulated transactions no entry; and the third including narrative information—the description of the measure.

The concept of "controls" on CTs is interpreted broadly. Thus, a control is considered to be in place when the information contained in the narrative description refers to a transaction explicitly requiring "authorization," "approval," "permission," or "clearance" from a public institution. Other measures such as limits, caps on the amount that can be transacted, taxes, holding periods, or quotas on the transactions are also considered controls on CTs (AREAER Compilation Guide, 2017). "Controls" do not necessarily coincide with the concept of "restrictions," which is a term usually reserved for measures that are inconsistent with IMF Article VIII Section 2.a.

Indexes of capital account openness

18.   The development and use of indexes of capital account openness have proliferated in the past two decades. Existing indexes can be broadly classified as "de jure" or "de facto." De jure indexes combine information on measures in place that affect international capital account transactions, whether administratively or through market mechanisms. De facto indexes use data on countries' international asset positions or other financial measures (such as deviations from interest rate parity) to document the extent to which a country is integrated within international financial markets. "De jure" indexes are generally the preferred approach to quantify capital account openness across countries and to document the use of rules to regulate flows, since they reflect policy actions directly influencing inward and outward capital account transactions. All major de jure indexes used in academic and policy work are derived from data on capital account regulations collected by the Fund via the AREAER.

19.   In 2011, the Fund's Monetary and Capital Markets Department (MCM) developed two in-house indexes of capital account openness based on the AREAER data. The first, the Financial Account Restrictiveness Index, is a broad index obtained by averaging binary (i.e., "open" or "closed") indicators of restrictiveness in 62 categories of capital account transactions in the AREAER.[9] The second index is based on a narrower set of restrictions (21) on equity, bond, money market, collective investment instruments, financial credit, and direct investment by direction.[10] While these indexes are regularly maintained, they are only sporadically referenced in Fund documents (notably in Figure 1 of IMF, 2012c), and neither is made available outside MCM.[11]

20.   Researchers in academia and policy institutions have created multiple other de jure indexes that reflect their specific research needs. Some indexes focus on different asset categories (FDI, portfolio investment, and bank and other investment), while others focus on the direction of flows (inflows versus outflows) and/or the residency of the holder of the assets involved in the transaction.

21.   The first attempt at a comprehensive index of de jure restrictions was compiled by Chinn and Ito (2006). It is still widely used and quoted, and data are now available for 181 countries for

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[9] The categories include capital transactions, foreign exchange and domestic currency accounts of residents and non-residents, regulatory measures related to the financial sector, and repatriation and surrender requirements. The index distinguishes between inflows (non-residents' investments in the country) and outflows (residents' investments abroad).

[10] This index is similar to the Schindler (2009) and the Fernandez and others (2016) indexes. The difference between the Schindler index and the IMF staff's narrow restrictiveness index is that the former includes a limited qualitative assessment of controls. For example, if a measure requires only notification of the transaction, if the control covers only a few sectors of the economy, or if the measures are maintained for anti-money laundering or security reasons, the index considers the transaction as not controlled. For the period of the availability of the Schindler index, the correlation between these two indexes is more than 92 percent.

[11] In 2016 the Fund also published an index of capital account restrictions for 164 low-income and developing countries with information on 12 types of asset categories—the Wang-Jahan Capital Account Openness Index, covering the period 1996–2013, based on an in-house working paper (Wang and Jahan, 2016).

the 1970–2017 period. The Chinn-Ito index is a normalized index that captures the combined restrictiveness of the capital and current accounts, as well as whether a country has multiple exchange rates and/or imposes surrender requirements of export proceeds. Another widely used index, the Quinn index (1997)—and its most recent incarnation, the Quinn and Toyoda (2008) index—also includes restrictions on both capital account and current account transactions and does not provide separate indexes by category of assets, although unlike the Chinn-Ito index it distinguishes between inflow and outflow measures for both categories (Table 1). Other widely used indexes are based on more granular assessments of capital account measures distinguishing among different transaction categories (e.g., Fernandez and others, 2016; Gupta and Masetti, 2018; Forbes and others, 2015; Del Giudice and Wu, 2013; Ahmed and others, 2015; Chantapacdepong and Shim, 2014; and Pasricha and others, 2018).

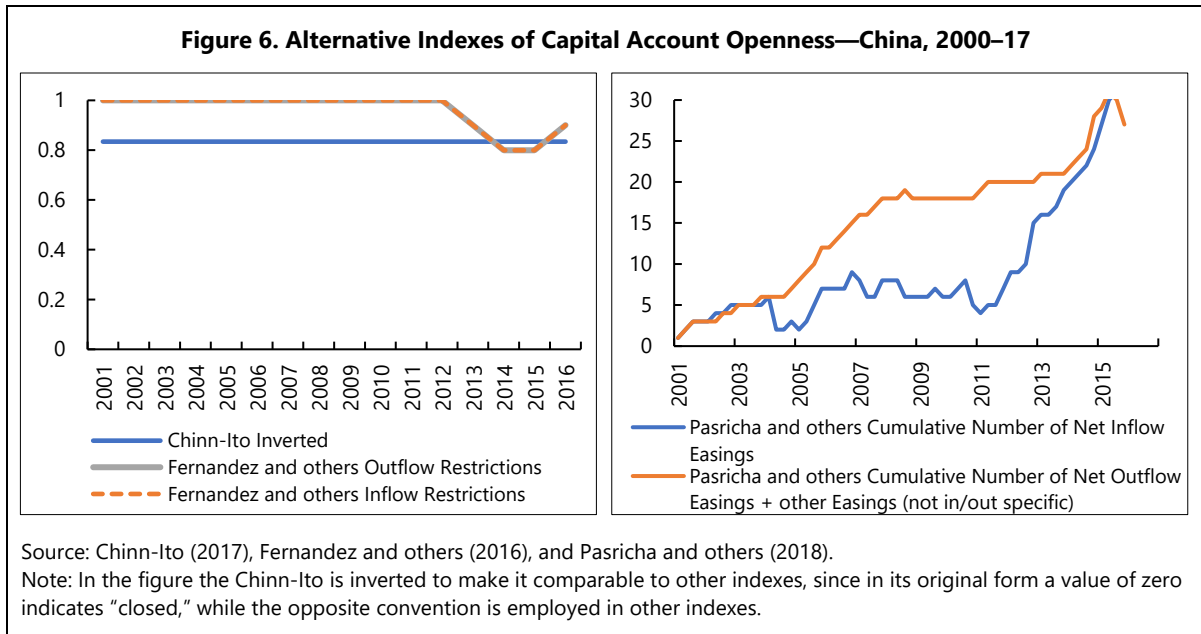| **Table 1. Comparison of Popular Indexes of Capital Account Openness**						
	Chinn-Ito (2006)	Quinn-Toyoda (2008)	Fernandez and others (2016)	Pasricha and others (2018)	Gupta and Masetti (2018)	Acosta-Henao and others (2020)
Level or Change in Rates of Capital Controls	Level	Level	Level	Change	Level	Level and Change
Direction of flows	No	Yes	Inflows and Outflows	Inflows and Outflows	Inflows and Outflows	Inflows and Outflows
AREAER capital transactions asset classes	1	1	10	N/A	12	N/A
Frequency of observation	Annual	Annual	Annual	Daily	Quarterly	Quarterly
Frequency available online	Annual	Annual	Annual	Quarterly	N/A	Quarterly
Number of countries	182	122	100	21	47	21
Period of coverage	1970–2014	1949–2018	1995–2015	2001–2015	1999Q1–2016Q2	1995–2014
Best use	Cross-country comparisons of levels of openness; Identifying "Walls" vs. "Gates"	Cross-country comparisons of levels of openness; Identifying "Walls" vs. "Gates"	Cross-country comparisons of levels of openness; Identifying "Walls" vs. "Gates"	Capturing evolution of policy	Capturing evolution of policy	Quantifying the economic significance of a given change
Limitations	First differences, may not capture effect of policy actions	First differences, may not capture effect of policy actions	First differences, may not capture effect of policy actions	Cumulative changes do not capture level of openness	N/A	"Price-based" measure, so captures effect of only a portion of restrictions used

22.   These "third-party" indexes differ to the extent that they use information on residency-based measures from the Capital Transaction section of AREAER only or use broader information. The Chinn-Ito index, for example, is constructed using only the principal component of the

original variables pertaining to regulatory controls over current or capital account transactions, the existence of multiple exchange rates, and the requirement to surrender export proceeds; the Fernandez and others (2016) index uses only the AREAER's Capital Transaction section; while the Pasricha and others (2018) index uses both the Capital Transaction and Financial Sector sections of the AREAER.

23.   Some indexes, such as Pasricha and others (2018), supplement the AREAER information with data from the country's international investment position, regulators' press releases/ notifications, Organization for Economic Cooperation and Development's (OECD) documents on investment measures, news sources, and other research papers.

24.   While most of the indexes only reflect the existence (or absence) of capital account restrictions, a few have been constructed explicitly to measure the *intensity* of restrictions, namely how tight the restrictions are in relative terms and whether restrictions already in place are being tightened or loosened and to what extent, as opposed to simply whether controls are "on" or "off." Such indexes include those of Quinn and Toyoda (2008), Fernandez and others (2016), Pasricha and others (2018), Gupta and Masetti (2018), and Acosta-Henao and others (2020), all of which go beyond the approach of binary indexes. To capture changes in capital account regulations, or policy "actions," for example, the Pasricha and others (2018) index is based on a more finely tuned calibration of measures reported in the AREAER that is closer to instrument-level precision and thus splits policy announcements that often contain actions on multiple regulatory instruments. Intensity is then measured by taking differences in policy actions weighted by the share of the foreign balance sheet that they affect. The Quinn-Toyoda (2008) index assumes that some measures, such as tax or price measures to influence capital flows, are less restrictive than are quantity or other regulatory restrictions, thus assigning different weights to different types of restrictions when calculating the level of capital account restrictiveness. Most indexes are annual in frequency, but monthly, and quarterly indexes have recently been produced to measure policy actions over shorter intervals (e.g., Pasricha and others, 2018; Gupta and Masetti, 2018; Cantú, 2019).

25.   Higher-frequency indexes that are weighted for the estimated intensity of the different capital account restrictions tend to offer substantially different views of the evolution of capital account openness than annual, binary indexes which characterize restrictions simply as "on" or "off." This difference reflects a variety of reasons, including because a capital restriction measure introduced and reversed within the same year would not be recorded in an annual index value. Figure 6 compares, for example, the quarterly index of Pasricha and others, which tracks the cumulative change in capital account openness, with the annual Chinn-Ito and Fernandez and others (2016) level indexes for the case of China. While the former suggests that China has actively managed its capital account restrictions and consistently loosened its capital account restrictions between 2000 and 2016, the latter point to little or no change in the degree of liberalization over those years.

Figure 6. Alternative Indexes of Capital Account Openness—China, 2000–17

Chinn-Ito Inverted
Fernandez and others Outflow Restrictions
Fernandez and others Inflow Restrictions

Pasricha and others Cumulative Number of Net Inflow Easings
Pasricha and others Cumulative Number of Net Outflow Easings + other Easings (not in/out specific)

Source: Chinn-Ito (2017), Fernandez and others (2016), and Pasricha and others (2018).
Note: In the figure the Chinn-Ito is inverted to make it comparable to other indexes, since in its original form a value of zero indicates "closed," while the opposite convention is employed in other indexes.

Capital account liberalization trends

26.   Most indexes of capital account openness suggest a gradual and long-term trend toward liberalization of capital flows in both advanced countries and EMDEs, which continued in the wake of the global crisis (Figure 7). Evidence from higher-frequency indexes reinforces this view, suggesting that EMs have continued to ease capital account measures, especially measures affecting outflows, although the easing of inflow measures slowed temporarily during the GFC (Figure 8). However, indexes can differ over the shorter run, reflecting the different composition and weights assigned to restrictions in their aggregates. The Chinn-Ito index, for example, points to a more pronounced slowdown in the liberalization path of EMDEs and low-income countries than does the Fernandez and others index, while the Quinn-Toyoda index suggests a very mild deceleration in liberalization in these regions until the GFC and a stronger deceleration afterwards, relative to the other two indexes. Likewise, looking at AEs, the Quinn-Toyoda and Chinn-Ito indexes both point to a quasi-monotonic liberalization, whereas the Fernandez and others (2016) index shows a marked reversal in the degree of AEs' financial account openness since around 2005.

27.   Trends in liberalization have also varied across regions. Capital account opening decelerated after the GFC in emerging markets in Europe, the Commonwealth of Independent States, and Latin America—with the exception of Argentina which liberalized dramatically in 2016–17, while EMs in Asia continued to open up, at least according to the Fernandez and others index (Figure 7). Still, capital accounts in Asia appear more closed than those in Latin America, which in turn appear more closed than those in Emerging Europe. As shown in Figure 9, which plots the distribution of openness across countries in different regions as measured, there are important heterogeneities within each regional group—a phenomenon particularly evident in Latin America and Emerging Europe, and less so in Asia.

Figure 7. Evolution of Selected Indexes of Capital Account Restrictiveness

EMs and AEs

EM Europe

Latin America

EM Asia
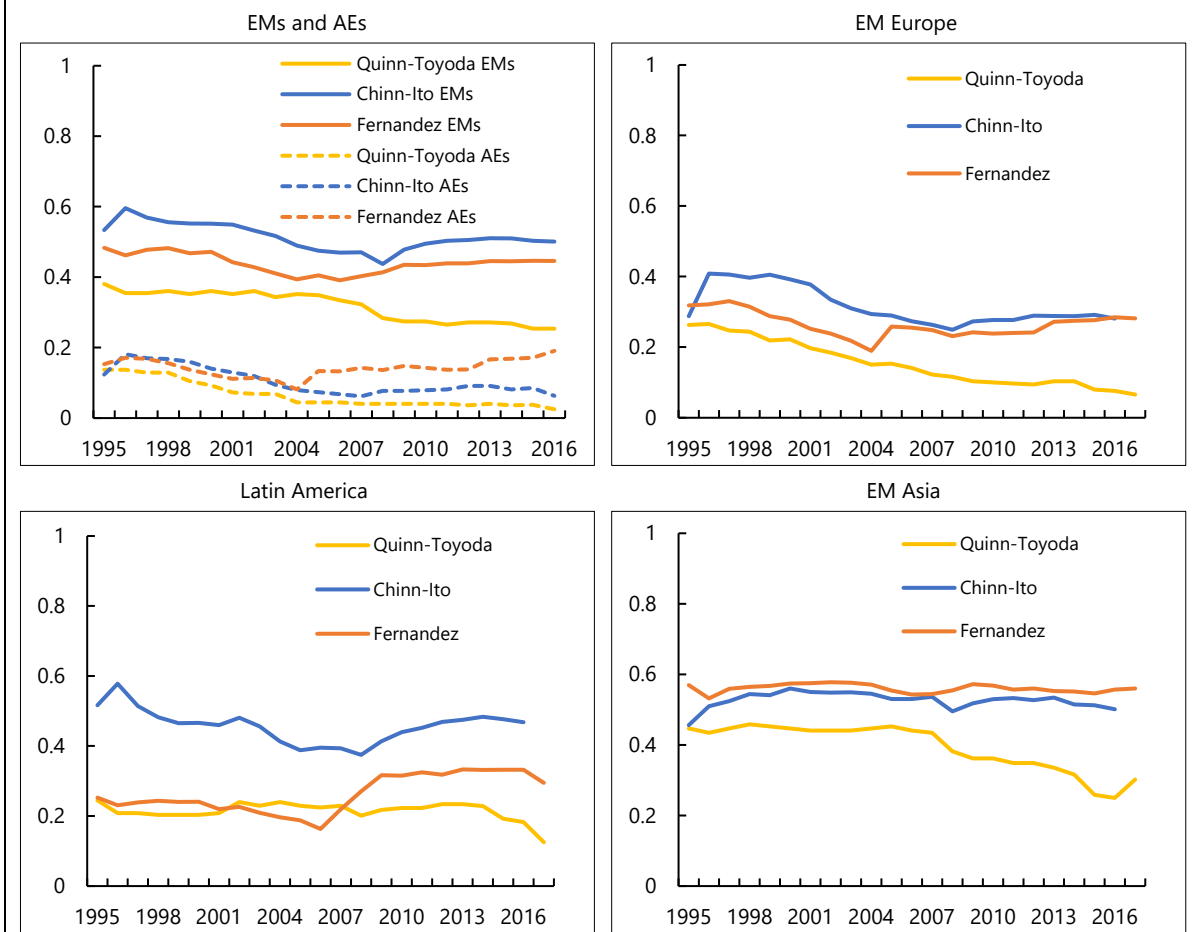
Source: Chinn and Ito (2017); Fernandez and others (2016).
Notes: "1" denotes more restrictions. Quinn-Toyoda and Chinn-Ito indexes are rotated to be consistent with Fernandez and others index.

Figure 8. Chinn-Ito vs. Fernandez and Others vs. Pasricha and Others Indexes—EM Average, 2000–17

EM Average

EM Average
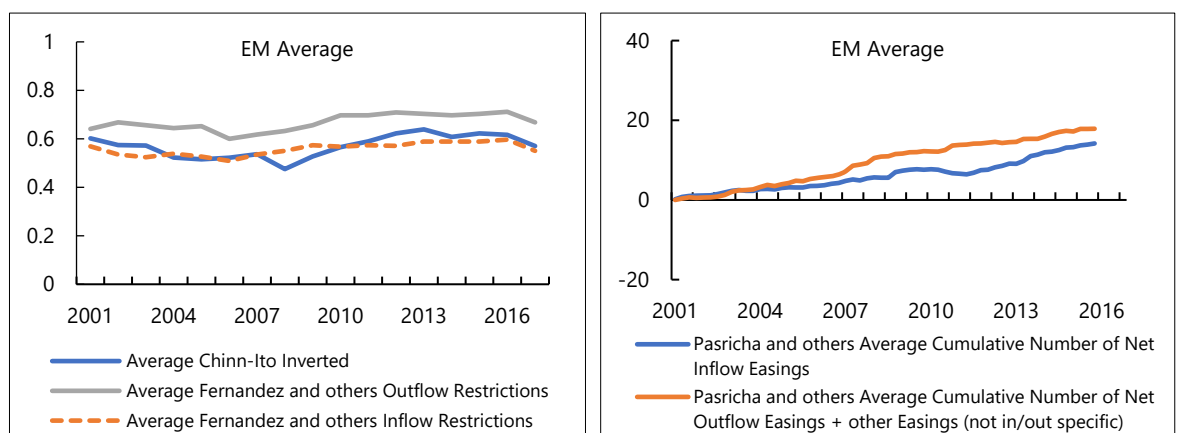
Source: Chinn-Ito (2017), Fernandez and others, (2016), and Pasricha and others (2018).
Note: The EM sample countries are Argentina, Brazil, Chile, China, Colombia, Egypt, India, Indonesia, Malaysia, Mexico, Morocco, Peru, Philippines, Russia, South Africa, Thailand, and Turkey.

Figure 9. Level of Capital Account Restrictions in EMs (Fernandez and Others index), 2008 and 2017

2008

2017

Source: IEO staff calculations.

Notes: The horizontal line within each box indicates the median aggregate level of capital account restrictions in each region as measured by the Fernandez and others (2016) index. The top of the box indicates the fourth quartile while the bottom of the box indicates the first quartile of the regional distribution.

Assessment of IMF contribution

28.   As noted earlier, the AREAER is the only publication that records and classifies information on capital account restrictions in a systematic way over time and across most countries in the world. The AREAER thus plays a unique role in providing the raw material for analysis of the implications of such policies. The IMF staff deserves substantial credit for providing this essential public good, particularly in the face of the limited internal resources it has devoted to this task. To facilitate use of the data, the staff has provided in recent years a free online tool that offers direct access to the data (as well as exchange rate and trade restrictions data) and permits search across years, countries, and specific categories.

29.   Having high quality data on capital account restrictions is necessary to analyze the effectiveness of restrictions and is particularly important for cross-country comparisons and for the evenhandedness of economic policy advice, including because a country's degree of capital account openness is relevant to other countries. However, the Fund has made relatively limited attempts to go beyond the provision of these basic data and utilize them to develop policy-relevant indexes for judging the effectiveness and impact of capital account measures. Interviews with staff members indicate that this is in large part due to competing priorities within the Fund's MCM Department, which is in charge of the AREAER database. This resource constraint intensified with the launch of the Fund's Macro-Prudential Policy Survey database ("iMaPP," see Alam and others, 2019), which is compiled and maintained largely by the same staff members.[12]

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[12] Over the past decade the collection of the AREAER dataset has been managed by one specialist staff member supported by two contractual financial experts on a part-time basis. A second specialist staff member has recently been added.

30.   The absence of "in-house" measures of capital account openness and restrictions means that the Fund staff has had to rely on the third-party indexes described above, which are not necessarily constructed with the Fund's analytical or policy priorities in mind. For instance, the external balance assessment (EBA) estimates real equilibrium exchange rate norms using information on the use of capital account restrictions derived from the Quinn-Toyoda (2008) index, which the authors update regularly upon request by the Fund staff.[13] And empirical work used to quantify the Fund's tool for the assessment of reserve adequacy (ARA) uses both the Chinn-Ito (2006) and the Quinn-Toyoda (2008) indexes to control for countries' use of capital account measures in calculating reserve adequacy (IMF, 2016b).

31.   Building on existing internal Fund indexes of capital account restrictions, the Fund could consider compiling and publishing its own index of capital account openness that is both universal and granular, and mapping the definition of CFMs used in Fund advice under the IV with this new index and the AREAER. This could help cast Fund advice in a cross-country context and thus enhance its consistency, objectivity, and accountability. Ideally, to maximize cross-country comparability, a Fund index should have various distinctive characteristics : (i) provide coverage of the Fund's entire membership, to allow the tracking of liberalization trends across regions at different levels of economic and financial development and to maximize cross-country consistency and comparability of Fund capital flow management advice; (ii) distinguish controls across asset classes, and the currency and residency of asset holders, to allow more granularity in the analysis of flows, their determinants, and the respective role of policies; (iii) aim for a shorter than annual frequency, to allow for the alignment of the data on restrictions with the Fund's Article IV surveillance cycles. Additional goals like measuring the intensity of capital controls—for example by using a simple set of weights as in Fernandez and others (2016)—as well as measuring the impact on capital account openness of new (loosening or tightening) measures ("flows") versus the impact of existing measures ("stocks") in addition to their number, could be part of a more ambitious work agenda.

32.   Since the AREAER does not track whether outstanding measures are actually enforced, further work over the medium term could also aim at developing an ancillary index that takes account of the de facto application of restrictive measures, possibly based on a questionnaire of market participants, to generate an "ease of investing/divesting index" along the lines of the World Bank's Ease of Doing Business index—a benchmark study of regulations also based on a questionnaire of market participants.

33.   In addition, more could be done to increase the resources available for the data collection processes and reporting of the AREAER itself in order to facilitate greater reliability and better cross-country comparisons of capital account openness and changes over time. This

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[13] The IV itself refers to the Fund's AREAER dataset only once, in a note to a chart portraying staff estimates of trends in capital account liberalization. See Figure 1, IMF (2012c).

would help address concerns that the reliance on self-reporting for the AREAER can lead to discrepancies in reporting practices and therefore the potential for inaccuracies.[14]

IV. CAPITAL FLOW MANAGEMENT MEASURES: THE FUND'S POLICY FRAMEWORKS

34.   This section describes the basis for assessments by Fund staff on whether capital account measures should be classified as CFMs. Making this assessment is not easy. The original 2012 document formulating the IV has been followed by a nearly annual endeavor over the period 2013–19 to clarify the interpretation of the IV (IMF, 2013a; 2014; 2015; 2016a; 2016c; 2018b; 2019)—together these documents make up the "IV Framework."

35.   In addition to the IV, the IMF's Macroprudential Framework also plays an important role in guiding Fund advice on capital account restrictions. Some measures are classified as both macroprudential measures and CFMs; the Fund's advice on these CFMs/MPMs is guided by both the IV and the Macroprudential Framework.

CFMs: Measures designed to limit capital flows

36.   Among capital account measures, the Fund pays particular attention to policy measures that are judged as being designed to limit capital flows, dubbing them "capital flow management measures"[15] (IMF, 2012c, Annex II),[16] and refers to "capital flow liberalization" as the process of "removal of CFMs."[17] The IV clarifies that CFMs fall into two groups:

- *Residency-based measures.* These include a variety of measures (including taxes and regulations) affecting cross-border financial activity that discriminate on the basis of residency. These measures are also sometimes referred to as "capital controls."

- *Other measures*, which do not discriminate on the basis of residency but are nonetheless designed to limit capital flows.[18] Prudential measures that are not designed to limit

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[14] The case of Chile illustrates this challenge. Large revisions to Chile's reporting in the AREAER occurred in 2008, many years after the 1999 liberalization of its capital account. This happened while Chile was in the process of accession to the OECD, which triggered efforts to homogenize information on capital account regulations reported to the IMF and the OECD (see the background paper by Batini and others, 2020).

[15] The CFM nomenclature follows closely the terminology laid out in IMF (2011), paras 7 and 43, and IMF (2012c), para 7.

[16] Beyond measures listed in the AREAER dataset, CFMs include "equivalent" measures that do not expressly differentiate on the basis of residency and so are not listed in the AREAER, but nonetheless have effects equivalent to residency-based limits. Thus, the CFM set is potentially larger than the AREAER set of measures, although not all measures listed in the AREAER are CFMs.

[17] Para 11 of the Institutional View (IMF, 2012c).

[18] There are several examples of currency-based CFMs from the Financial Sector section of AREAER. One example is a measure that Peru introduced in 2011 and modified in 2012 and then 2015, involving the setting of a limit at 40 percent of net worth or 400 million Peruvian soles for the net position in derivatives in foreign currency, whichever of these was higher. This measure appeared in Section XII.A.9.a of the AREAER.

capital flows but rather to ensure the resilience and soundness of the financial system are not CFMs. Macroeconomic policies, similarly, would not normally be CFMs and nor would structural and other policies that, while they may directly or indirectly inhibit capital flows, are not designed to limit capital flows.

37.   The IV states that the classification of a particular measure as a CFM requires "judgment as to whether the measure is, in fact, designed to limit capital flows. This assessment in turn needs to be based on country-specific circumstances, such as whether the measure was "introduced or intensified in response to an inflow surge or disruptive outflows" (IMF, 2012c, Annex II, paras 1 and 2). This approach implies that the same measure can be classified differently in different countries and in the same country at different times (IMF–G20, 2018, para 2, p. 3). The challenge of applying the criterion is amplified because criteria to identify a surge are not precisely defined.

38.   An additional factor is that the IV suggests that the staff should assess the appropriateness of a CFM only if it is deemed to be macro-relevant.[19] However, the criteria for assessing macro-relevance have not been defined precisely, which leaves room for inconsistency of treatment.

39.   To help explain past decisions on CFM classifications, in 2018 the Fund published a Taxonomy of Capital Flow Management Measures (IMF, 2018c) that lists all measures assessed by the Fund staff as CFMs and discussed in published IMF staff reports since the adoption of the IV in November 2012.[20] A new edition of the Taxonomy is produced every year, reporting new measures that were introduced or changes in the settings, calibration, or enforcement (i.e., tightening, easing, or tighter or looser enforcement of measures) and removal of existing measures. The 2019 Taxonomy, reporting on measures taken by countries up to December 31, 2018, was published in October 2019.

CFMs/MPMs: Measures designed to limit systemic financial risks and to limit capital flows

40.   MPMs are defined in the Fund's Macroprudential Policy Framework (IMF, 2013b; 2014) as measures designed to limit systemic financial risks, including risks associated with capital flows. Prudential measures such as capital adequacy requirements, loan-to-value ratios, and limits on net open foreign exchange positions that are not designed to limit capital flows but rather solely to ensure the resilience and soundness of the financial system are not deemed to be CFMs.

41.   However, some MPMs may be judged as also having an intent to limit capital flows and are classified as both CFMs and MPMs (CFMs/MPMs). In such cases, IMF advice on their use is

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[19] The April 2013 and December 2015 Guidance Notes define "macro-relevance" in terms of a "significant impact on the country's domestic or balance of payments stability," or the potential for spillovers that have implications for "global economic or financial stability" (IMF, 2013a; 2015). Beyond these cases, CFMs are discussed also at the request of the member states (IMF–G20, 2018).

[20] The appropriateness of measures adopted before the IV's introduction may still be evaluated, for example in the context of liberalization or reimposition of CFMs following a premature liberalization (IMF, 2019).

governed by both the IV framework and the Fund's Macroprudential Policy Framework (IMF, 2013a; 2014). For a measure to be classified as a CFM/MPM, there must be a potential source of systemic financial risk stemming from capital flows that has to be addressed and a path of transmission through which the measure can reasonably be expected to reduce such risks.

42.   Under the Fund's guidelines, advice on the use of CFMs/MPMs should take into consideration whether other MPMs that are not CFMs are available that could achieve the same objective. There should be a reasonable expectation that the CFM/MPM is more effective, efficient, and less distortive than pure MPMs in addressing financial risks (IMF, 2015; 2017; 2018b). Under the Fund's policy framework (IMF, 2014), there may be "scope to maintain CFMs/MPMs for longer even after capital inflow pressures have abated," but the Fund would assess "whether there are alternative measures to address the systemic risk that are not designed to limit capital inflows" in order to evaluate their usefulness relative to their costs.
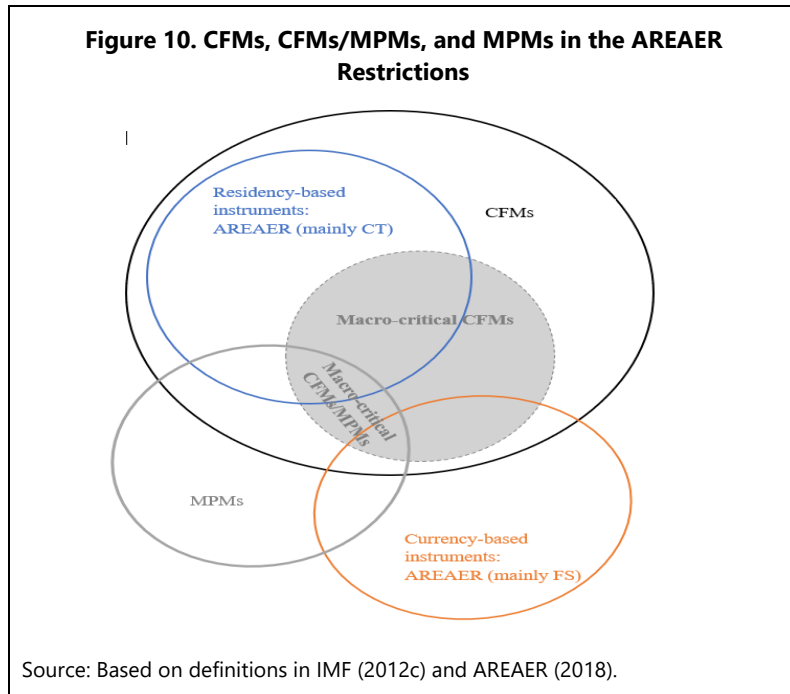
CFMs in the AREAER

43.   It should be clear from the above that the relationship between CFMs and measures covered in the AREAER is complex and its interpretation requires some subjectivity. Figure 10 depicts this relationship using a Venn diagram. All residency-based measures are CFMs by definition, while a measure that has both residency and currency elements (e.g., limits on issuance of foreign currency bonds by non-residents in the local market, when residents may be allowed to issue such bonds), is considered as a residency-based measure. This is why in Figure 10, the residency-based and currency-based circles do not overlap. In practice they do, but this assumption keeps the diagram somewhat simpler. Technically, some measures that are neither residency-based nor currency-based could be characterized as CFMs. A theoretical example is given by sectoral macroprudential measures (e.g. a higher risk weight) applied to bank lending to a certain sector that is insignificant domestically but large abroad and can thus impact cross-border capital flows. Finally, some measures that are neither capital restrictions nor prudential measures (like, for example, changes to a country's financial sector regulatory framework) are occasionally included in the AREAER for the record.[21]

V. DEALING WITH CAPITAL FLOWS: HOW COUNTRIES HAVE USED TOOLKITS IN PRACTICE

44.   This section looks at how EMs have combined the use of capital flow management measures with adjustment of other policies over the past two decades. The analysis is conducted for the period 2005–17 for 12 countries—China, Brazil, India, Indonesia, Korea, Malaysia, Mexico, Poland, Russia, South Africa, Thailand, and Turkey.[22]

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[21] An example of these measures is the permission to perform foreign transactions granted to banks and nonbank financial institutions in Belarus in 2017 (AREAER 2017, Section XII.A).

[22] This is the group of EMEs covered in the Fund's EBA, which is used in the analysis below.

Figure 10. CFMs, CFMs/MPMs, and MPMs in the AREAER Restrictions

Residency-based instruments: AREAER (mainly CT)

CFMs

Macro-critical CFMs

Macro-critical CFMs/MPMs

MPMs

Currency-based instruments: AREAER (mainly FS)

Source: Based on definitions in IMF (2012c) and AREAER (2018).

"Warranted Macroeconomic Adjustment"

45.　The IV framework specifies circumstances where introducing CFMs can help to support macroeconomic policy adjustment and safeguard financial system stability. In the face of a surge in capital inflows, these include: (i) when the room for adjusting macroeconomic policies is limited; (ii) when the needed policy steps require time or when the macroeconomic adjustments require time to take effect; and (iii) when an inflow surge raises risks of financial system instability (IMF, 2012c). When CFMs are used, the Fund prescribes that their use should be "transparent, targeted and temporary, and preferably non-discriminatory," while being tailored to country circumstances. In crisis situations, or when a crisis may be imminent, there could be a temporary role for CFMs on outflows, which should always be part of a broader policy package.

46.　The framework notes that only rarely would CFMs be the sole policy response to an inflow surge or disruptive outflows and that they should not substitute for "warranted macroeconomic adjustment" (IMF, 2012c). The IV provides a list of possible policies to deal with surges in capital inflows and outflows (IMF, 2012c, para 30).

47.　As shown in Table 2, the IV's recommended policies for dealing with inflows and outflows are similar but not entirely symmetrical. For inflows, the appropriate mix includes "rebalancing the monetary and fiscal policy mix consistent with inflation and growth objectives, allowing the currency to strengthen if it is not overvalued, and building foreign reserves if these are not more than adequate" (IMF, 2012c). For outflows, the framework indicates that CFMs should be used only in crisis situations or when a crisis is considered imminent. As with inflows, outflow CFMs are seen as more effective when deployed together with sound macroeconomic policies as well as

financial regulation. Finally, especially in the face of outflows, CFMs should be transparent and temporary, being lifted once crisis conditions abate, and should seek to be non-discriminatory (IMF, 2016c). They also need to be comprehensive to avoid circumvention.

Table 2. Institutional View-Suggested Policy Responses to Capital Flows		
IV-suggested policies	Inflows	Outflows
Monetary Policy #1	Ease (countercyclically)	Tighten (countercyclically)
Monetary Policy #2	Ease (if REER overvalued)	Tighten (if REER undervalued)
Fiscal Policy	Tighten[1]	Tighten[a]
Exchange Rate Policy	Allow to appreciate	Allow to depreciate
FX Intervention	Sell (if REER overvalued) + Sterilize	Buy (if REER undervalued) + Sterilize
CFMs	Tighten (when room for adjusting macroeconomic policies is limited; when needed policy steps take time or when macroeconomic adjustment requires time to take effect; or when an inflow surge raise risk of financial instability)	Tighten (when there is a "crisis", or a crisis is imminent, other policy actions have been activated and CFMs are useful to support those)

Source: Based on IMF 2016c, Box 1, and IMF (2012c).
Notes: Two suggested policy responses to capital flows for monetary policy are listed in line with IMF (2012c and 2016b) which suggest easing (tightening) monetary conditions depending on cyclical conditions and/or depending on the sign of the misalignment in the real exchange rate. See footnote 22. REER stands for "real effective exchange rate."
[a] The IV postulates that fiscal tightening would help moderating inflows because it helps "reduce the interest differential between domestic and foreign assets (a pull factor)" (para 30, IMF, 2012c). In case of outflows, fiscal tightening improves market expectations about debt sustainability which is often a trigger of outflows.

48.   In the analysis here, actual policy adjustment is quantified against the Fund's own metrics of appropriate macroeconomic and macroprudential policy stance. Measuring deviations of actual policy stance from the Fund's recommended stance, i.e., "policy gaps," provides a picture of whether countries are moving in the direction of Fund-advised policy responses to capital flows or steering away from them. Observed reductions in these policy gaps suggest "warranted macroeconomic adjustment" is occurring. And while it is virtually impossible to nail a direct correspondence between advice given and Fund-defined policy gaps, because Fund advice always embeds a time-varying, country- and team-specific amount of judgment, integrating the information from these quantitative gaps with qualitative information contained in Fund surveillance documents can suggest whether countries were marching in the direction of IV-suggested policy responses to capital flows or away from them at the time when capital flows required a direct response.

49.   In line with the IV framework, we calculate five policy factors, each of which measures the direction of action in IV-suggested policy responses to capital flows. If a policy action goes in the direction of warranted adjustment under the framework, we assign a value of one to the measure, and if the policy action goes in the opposite direction, we assign a value of zero. This binary coding allows us to build simple metrics of policy factors that can be used to study the

relationship between policy domestic adjustments and the use of capital account restrictions. Annex I provides more details about the methodology and data used to derive these factors.

50.   The five policy factors are measured as follows:

- *Monetary policy factor ("PF1a" and "PF1b").*[23] The monetary policy gap is measured in two ways. The first considers the extent to which interest rate policies are appropriately countercyclical: a reduction (increase) in the nominal short-term rate when the output gap is negative (positive) is taken to indicate that the country's monetary stance policy is countercyclical and thus broadly in line with the warranted adjustment recommended by the IV. The second considers the adjustment of interest rates in response to currency disequilibria[24]: a reduction (increase) in the rate when the exchange rate is overvalued (undervalued) is expected to narrow (widen) the interest differential between domestic and foreign assets and is thus taken to indicate that monetary policy is broadly in line with warranted adjustment in the IV (and vice versa).

- *Fiscal policy factor ('PF2').* The fiscal policy gap is measured by taking deviations of a country's actual primary fiscal balance from the country's gross-public-debt-stabilizing primary fiscal balance as defined by the Fund's Debt Sustainability Analysis. A tightening of fiscal policy relative to this benchmark in the face of capital outflows would be warranted under the IV since it would reduce saving-investment balances and alleviate balance of payments pressures (see footnote a, Table 2).

- *Exchange rate policy factor ('PF3').* Exchange rate adjustment is measured by taking the 12-month change in the nominal effective exchange rate conditional on the sign of the country's real exchange rate disequilibrium from the EBA database.[25] An appreciation (depreciation) of the exchange rate in response to capital inflows (outflows) if the exchange rate is not overvalued (undervalued) is taken to indicate that the exchange rate has been allowed at least in part to absorb the shock driving the flow, and that, thus, the exchange rate policy is in line with warranted adjustment.

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[23] The IV postulates a dual role of monetary policy adjustment in the face of capital flows (IMF, 2012c, para 30). The first relates to the need to respond to inflow surges by "rebalancing the monetary and fiscal policy mix consistent with inflation and growth objectives," and the second refers to "allowing the currency to strengthen if it is not overvalued." Depending on the scope for monetary easing/tightening given inflationary pressures and the level of the real exchange rate versus its estimated norm, rates may be lowered or raised in adjustments following these two different criteria (rebalancing policy mix, on one side, and reducing interest rate differentials relative to abroad to affect the exchange rate, on the other side), which motivates our approach to introduce two different operational definitions of the monetary policy factor.

[24] The measure of currency disequilibrium is taken from the IMF's EBA database. For years before 2012—the first year when EBA estimates are available—we use the exchange rate disequilibria dataset EQCHANGE derived by Couharde and others (2017). See Annex I.

[25] The nominal exchange rate is assumed to adjust to bring the real exchange rate towards equilibrium for given inflation, which is typically more inertial.

- *Foreign reserves policy factor ('PF4')*. This measure considers the 12-month change in foreign exchange reserves, conditional on the sign of the country's real exchange rate disequilibrium from the EBA database. Provided that foreign reserves are "adequate," based on the Fund's Reserve Adequacy Metric,[26] decumulation of foreign reserves when the exchange rate is undervalued (negative EBA-estimated real exchange rate disequilibrium) indicates that the country's policy stance is in line with warranted adjustment according to the IV and vice versa.

- *Macroprudential policy factor ("PF5")*. Macroprudential adjustment is measured taking year-on-year differences in the Fund's aggregate Macroprudential Policy Index (IMaPP), conditional on the growth of domestic credit relative to nominal GDP—a proxy for sustainable credit growth. An increase in this index, which corresponds to a tightening (easing) of macroprudential regulations, when credit growth outpaces (falls short of) nominal income growth, indicates that the country's macroprudential policy is in line with warranted adjustment (and vice versa).

51.   A sense of the overall appropriateness of policy responses (PA index, henceforth) can be obtained by aggregating the five IV-relevant policy factors. The PA index is an unweighted sum of the individual policy factors across countries in a specific region, in turn normalized to vary between zero and one. A value of one indicates that domestic policies are all "on" (that is, they move in the direction advocated by the IV), while a value of zero indicates that they are all "off." Figure 11 plots the evolution of the PA index for different world regions vis-à-vis net capital flows to each region, showing also the breakdown of the index into adjustments in the underlying policies.

52.   While the interpretation of the PA index and its components should be done with care, given the caveats in deriving a quantitative definition of what constitutes warranted adjustment under the IV, and keeping in mind that the correlations shown here do not imply causality, three messages emerge from this analysis:

- On average, countries in all regions have adjusted their macroeconomic and macroprudential policies consistent with the Fund's IV at the time of, or in the run-up to, surges in capital flows, in particular in the run-up to the global financial crisis and then in the post-GFC recovery. Similarly, in most countries, macroeconomic adjustment was strengthened in the context of the capital account reversal in 2008 and 2009.

- During episodes of sustained capital inflows and of outflow surges, most countries seem to have combined the full range of policy instruments, suggesting that policymakers in emerging markets have relied on combinations of policies in an attempt to maximize

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[26] The Fund's Reserve Adequacy metric is based on a weighted average of a country's exports, broad money, short-term debts, and other liabilities, and reserves are assessed as adequate when they are within 100–150 percent of this metric.

effectiveness in the face of uncertainty about the ability of individual ones to smooth capital flows.

- Latin American and emerging Asian economies seem to have relied heavily on macroprudential policies and foreign exchange rate intervention, while Emerging Europe seemed to have relied more on exchange rate adjustments (Figure 11).

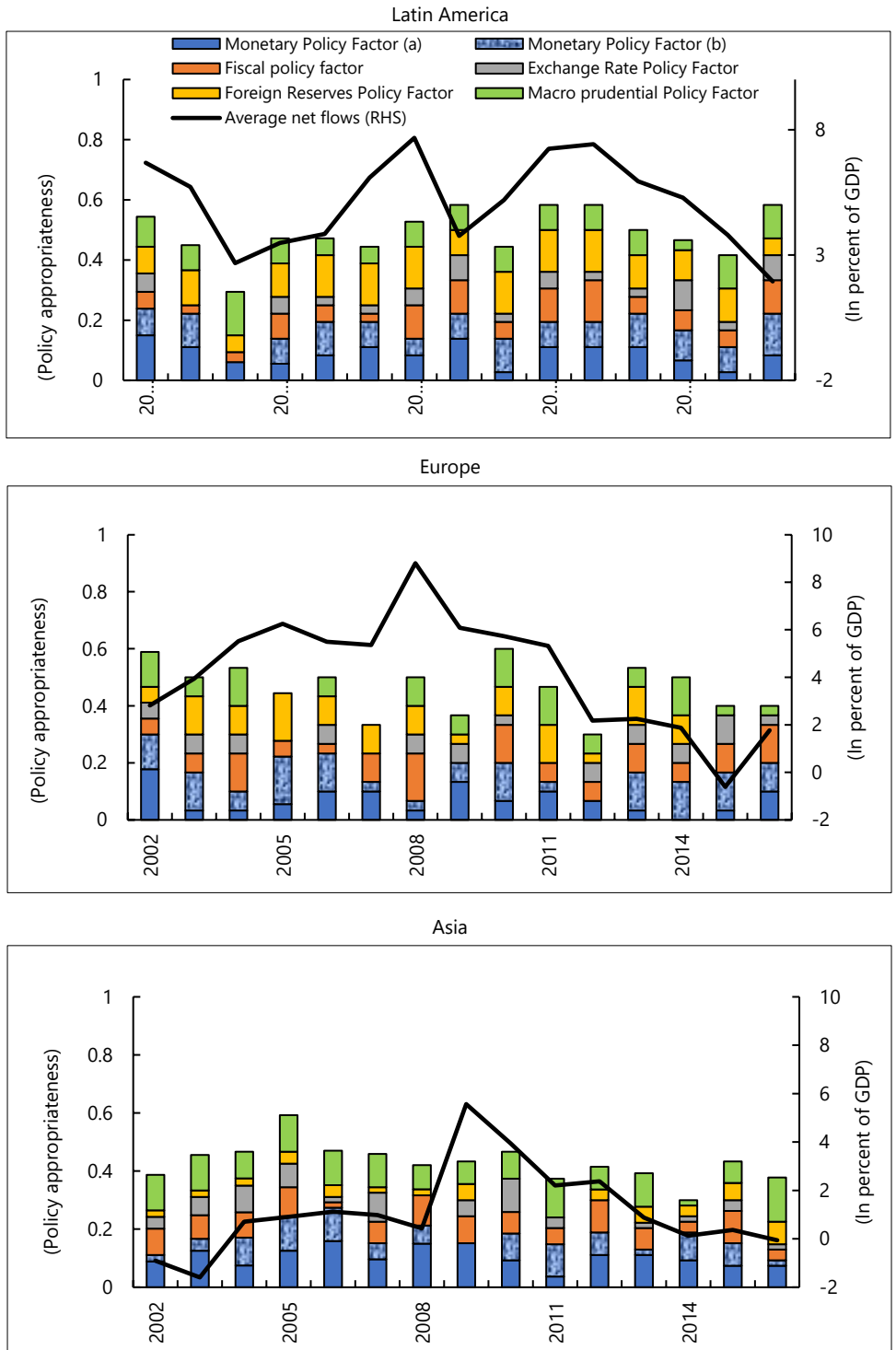**Capital account measures: complements or substitutes?**

53.   The policy appropriateness index can be used to examine whether countries have tended to use capital account measures as complements to or substitutes for other adjustments. Figure 12 plots the PA index against net tightening in capital account restrictions according to the Pasricha and others (2018) index for the Emerging Asian and Latin American economies in our sample. Each locus represents a pair of the level of the PA index/net tightening index for a given country in a given year during the sample period 2003–15. About four-fifths of the loci for both regions are located on, or close to, the vertical axis,[27] indicating that changes to capital account restrictions were minimal in most countries in most years—a finding that corroborates results in Gupta and Masetti (2018) and in Acosta-Henao and others (2020).

54.   Figure 12 does not provide much evidence of capital account measures being used as a substitute for adjustment in other policies. Since the early 2000s in Latin American economies, net tightening of capital account restrictions has been correlated positively with increases in the index measuring the appropriateness of macroeconomic and macroprudential adjustment. In emerging markets in Asia there is no apparent correlation—either positive or negative. For the sample of Latin American countries, the fitted trendline has an upward slope, suggesting that, if anything, the relationship between use of capital account restrictions and other policy adjustments is one of complementarity.
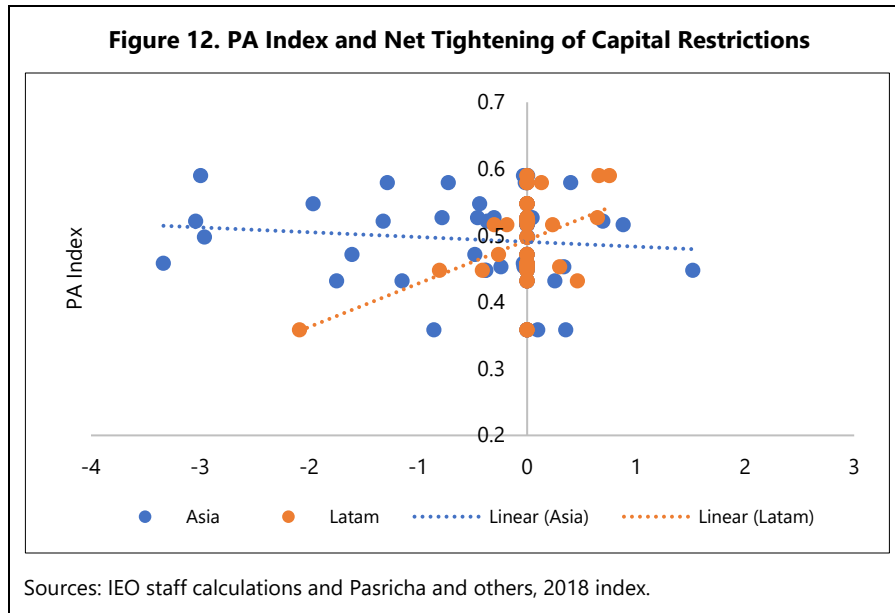
55.   Overall, the findings of this section suggest simultaneous use of both capital account measures and other adjustments, with policy typically set at "half ahead" on both sets of policies. Notably, no distinct relationship is apparent between the two policy sets over the time sample: different levels of capital account openness or net tightening of controls are associated with similar levels of macroeconomic and macro-financial adjustment. The findings cast doubt on the concern that countries tend to use capital controls as substitutes for macroeconomic adjustment, suggesting more that they normally use these controls to complement other policy tools. The experience with EMDEs' policy responses to the large capital flow reversal arising in the COVID-19 crisis has also been consistent with the view that countries' use of CFMs to manage capital flow volatility is quite limited and tends to be in conjunction with, rather than instead of, other policy levers (Batini, 2020).

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[27] The total number of loci in the scatterplot is large, but only a fraction of these can be counted with the naked eye because most tend to overlap with each other on the y-axis.

Figure 11. Policy Appropriateness Index

Source: IEO staff calculations.

Figure 12. PA Index and Net Tightening of Capital Restrictions

Sources: IEO staff calculations and Pasricha and others, 2018 index.

VI. CONCLUSIONS

56.   This paper focused on four aspects of Fund analysis and advice in capital flows and related policies.

- First, it provided a brief overview of the evolution of capital flows over the past 20 years, showing that flows to EMDEs have gone through several episodes of surge and reversal since the global financial crisis. Although the level of flows relative to GDP and the volatility in these flows have averaged around pre-GFC levels, the structure and dynamics of capital flows have shifted in ways that suggest that capital flow shocks pose continued risks, as reaffirmed by recent sharp swings at the onset of the COVID-19 pandemic.

- Second, it discussed data on capital account measures, finding that overall countries have continued to remove restrictions on their capital accounts since the GFC but that the liberalization process slowed during times of heightened capital flow volatility.

- Third, it found that the Fund has played the lead role in collecting data on such measures but has not been using these systematically when advising on capital flow management, and has relied on academics and other outside parties to use these data to construct indexes of capital account restrictiveness. This reliance risks the possibility that these measures may not be particularly well tailored for the Fund's policy analysis and other needs. The Fund should consider putting more resources into ensuring the integrity of the data on capital account measures in the AREAER and regularly constructing and publishing its own in-house indexes of capital account openness. Finally, the analysis indicates that countries have resorted to a mix of policies to deal with capital flow volatility, supplementing capital flow management measures with traditional levers of

macroeconomic and macroprudential policy adjustment. This suggests that the implicit concern on which much of the IV centers—that countries may rely too heavily on CFMs in place of warranted macroeconomic adjustment—has not been observed in practice.

ANNEX I. METHODOLOGY AND DATA NOTE

A. Methodology for Computing Policy Factors in Section V

1. Monetary Policy Factor (PF1a and PF1b)

The first Monetary Policy Factor (PF1a) is defined as:

$$PF1a = \begin{cases} 1, if\ \Delta i_t \leq 0\ and\ \widehat{Y_t} \leq 0\ or\ \Delta i_t > 0\ and\ \widehat{Y_t} > 0 \\ 0, \qquad\qquad otherwise \end{cases}$$

where Δi_t is the change in the money market interest rate between time t and time $t-1$ and $\widehat{Y_t}$ is the output gap at time t, where t represents a calendar year.

The second Monetary Policy Factor (PF1b) is defined as:

$$PF1b = \begin{cases} 1, if\ \Delta i_t \leq 0\ and\ MisBar_t > 0\ or\ \Delta i_t > 0\ and\ MisBar_t < 0 \\ 0, \qquad\qquad otherwise \end{cases}$$

Where $MisBar_t$ is a measure of exchange rate misalignment (Positive values of $MisBar_t$ indicate exchange rate overvaluation while negative values indicate "undervaluation").

Data on exchange rate misalignment are from the IMF EBA, starting from 2012.[1]

2. Fiscal Policy Factor (PF2)

The Fiscal Policy Factor is defined as:

$$PF2 = \begin{cases} 1, if\ |pb_t - pb_{t-1}^*| - |pb_{t-1} - pb_{t-2}^*| < 0 \\ 0, \qquad otherwise \end{cases}$$

Where pb_t is the government primary balance at time t and pb_t^* is the debt stabilizing primary balance at time t .

The debt stabilizing primary balance is defined as:

$$pb_t^* = \frac{g_t - r_t}{1 + g_t} d_{t-1}$$

Where r_t, g_t, d_{t-1} are the end-of-period real interest rate, the year-on-year growth rate of real GDP and the amount of (nominal) public debt outstanding at the end of period $t-1$.

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[1] For previous years, data on exchange rate misalignment are from the EQCHANGE Database (Couharde and others, 2017).

3. Exchange Rate Policy Factor (PF3)

The Exchange Rate Policy Factor is defined as:

$$PF3 = \begin{cases} 1, if\ \Delta e_t > 0\ and\ \Delta GCIF_t > 0\ and\ MisBar_t \leq 0\ or\ if\ \Delta e_t < 0\ and\ \Delta GCIF_t < 0\ and\ MisBar_t \geq 0 \\ 0, \qquad\qquad\qquad otherwise \end{cases}$$

where Δe_t is the year-on-year change in the bilateral nominal exchange rate vis-à-vis that of the U.S. dollar (an increase corresponds to an appreciation) and $\Delta GCIF_t$ is the year-on-year change in gross capital inflows to GDP.

4. Foreign Reserves Policy Factor (PF4)

$$PF4 = \begin{cases} 1, if\ \Delta FX_t < 0\ and\ MisBar_t < 0\ and\ ARA_t \geq 100\%\ or\ \Delta FX_t > 0\ and\ MisBar_t > 0 \\ 0, \qquad\qquad otherwise \end{cases}$$

Where ΔFX_t is the year-on-year change in foreign exchange reserves (scaled by the one-year lagged value of the monetary base) and ARA_t is the Fund's Reserve Adequacy Metric (in percentage). The level of foreign reserves is considered "adequate" when, as a percentage of the metric, it is above 100 and below 150 percent.

5. Macroprudential Policy Factor (PF5)

$$PF5 = \begin{cases} 1, \quad if\ \Delta MPI_t > 0\ and\ g_t^c > 0\ \ or\ \Delta MPI_t \leq 0\ and\ \ g_t^c \leq 0 \\ 0, \qquad\qquad otherwise \end{cases}$$

Where ΔMPI_t is the year-on-year change in the IMaPP Index[2] and g_t^c is the year-on-year growth rate of domestic credit to nominal GDP.

B. Data Used in the Calculation of Policy Factors in Section V

i_t: Financial, Interest Rates, Money Market, percent per annum (FIMM_PA). Source: IMF, International Finance Statistics.

$\widehat{Y_t}$: Output Gap (NGAP_R). Source: IMF, *World Economic Outlook* (*WEO*).

Y_t: Nominal GDP, current prices, domestic currency (NGDP). Source: IMF *WEO*.

fx_t: Foreign Reserves: International Liquidity, Total Reserves excluding Gold, Foreign Exchange, U.S. Dollars (RAXGFX). Changes in foreign reserves are scaled by domestic currency (34___SA, FASMB or FMA depending on data availability). Source: IMF BOP.

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[2] The IMaPP index is calculated as the sum of dummy variables representing tightening and loosening policy actions over 17 instruments and their subcategories.

e_t: Exchange Rates, U.S. Dollar per Domestic Currency, Period Average, Rate (ENDA _RATE). Source: IMF, International Finance Statistics.

ARA_t: Reserves over ARA EM metric in billions of USD, based on default exchange rate regimes (Percentage). Source: IMF.

MPI_t: The IMaPP index; the index is calculated as the sum of dummy variables representing tightening and loosening policy actions over 17 instruments and their subcategories. Source: Alter and others (2019).

$MisBar_t$: Exchange rate misalignment. Source: IMF EBA, starting from 2012.[3]

pb_t: Primary lending and borrowing (GGXONLB) divided by nominal GDP (NGDP). Source: IMF *WEO*.

$gcif_t$:   Net incurrence of liabilities (sum of Direct Investment (BFDLXF), other investments (BFOLDXF+BFOLEXF) and portfolio investments (BFPLXF)) divided by trend GDP (NGDP). Trend GDP is computed using a HP filter. Sources: IMF BOP and IMF *WEO*.

The equation for the debt stabilizing primary balance can be written as:

$$pb_t^* = \frac{g_t - r_t}{1 + g_t} d_{t-1} = \frac{g_t}{1 + g_t} d_{t-1} - \frac{1}{1 + g_t} \left(\frac{1 + i_t}{(1 + \pi_t)} - 1 \right) d_{t-1}$$

For the first term:

g_t: Gross domestic product, constant prices in national currency, percent change (NGDP_RPCH). Source: IMF *WEO* (Archives).

d_{t-1}: General government gross debt, national currency (GGXWD)[4] divided by nominal GDP (NGDP). Source: IMF *WEO* (Archives).

For the second term:

$i_t d_{t-1}$: General government expenses, nominal interest, national currency (GGEI) to nominal GDP (NGDP). Source: IMF *WEO* (Archives).

π_t: Inflation Rate; computed using GDP at current prices (NGDP) and GDP at constant prices (NGDP_R). Source: IMF *WEO* (Archives).

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[3] For previous years, data on exchange rate misalignment are from the EQCHANGE Database (Couharde and others, 2017).

[4] Note that on a cash basis, "gross debt" is equal to Government Finance Statistics Manual 1986 "outstanding debt." Note also that for the early years of the sample we use instead outstanding general government debt, depending on data availability.

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