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Motivating Capital Controls: Evidence from New Measures of Capital Flow Restrictions

Chikako Baba, Ricardo Cervantes, Salim M. Darbar, Annamaria Kokenyne, and Viktoriya V. Zotova

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ABSTRACT: Countries implement and liberalize capital controls opportunistically. To show this point, this paper introduces two novel indices—the Financial Account Restrictiveness Index (FARI) and the AREAER Change Index (ACI)—to measure and track capital flow restrictions across 190 countries quarterly from 1999 to 2022. FARI quantifies the restrictiveness of capital accounts, while ACI captures policy changes over time. These indices offer a comprehensive, objective, and high-frequency toolset to analyze capital account policies and their evolution over the past two decades. Using the two indices, the paper highlights global liberalization trends, regional differences, and the cyclical use of capital controls in response to macroeconomic conditions and crises.

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I. Introduction

Capital controls have long been part of the policy toolkit to manage capital flows to achieve various policy objectives. Many countries have seen the benefits of foreign investments, especially in countries with scarce capital resources, resulting in the removal of restrictions on inflows. Occasionally, large capital inflows have been seen to lead to undesirable exchange rate appreciation reducing external trade competitiveness which prompted the introduction of inflow controls. Removing controls on outflows allowed residents to diversify their investment portfolio, which can help stabilize the economy. Nonetheless, policymakers have often argued in favor of introducing outflow controls in countries facing capital flight due to inconsistent macroeconomic policies, inadequate financial sector policies or political uncertainty.

Economic literature has increasingly recognized that unregulated capital flows can magnify market imperfections and lead to financial crises. Theoretical justifications for capital controls include pecuniary externality causing excessive external borrowing, asset price bubbles, and an overheating economy. Benigno and others (2016), Bianchi (2011), Jeanne and Korinek (2010), and Korinek (2011) among others demonstrate that individual actors do not internalize their contribution to financial amplification effects of capital flows, giving rise to pecuniary externalities. Excessive short-term debt can trigger a liquidity problem and lead to financial stability concerns. Rey (2013) argues that capital controls on inflows can be used countercyclically to smooth a boom-bust cycle in capital inflows that can lead to currency appreciation and asset price inflation. Korinek (2018) argues that large welfare gains can be achieved from differentiating the regulation of capital inflows according to their structure and risk profile. There is also the well-known Keynesian argument based on monetary policy autonomy: capital controls help preserve monetary policy independence to manage interest rates under fixed or managed exchange rate regimes. Rey (2013) further argues that whenever capital is freely mobile, the global financial cycle constrains national monetary policies regardless of the exchange rate regime.

The role for capital flow management measures (CFMs) has also been recognized by the IMF's Institutional View on the Liberalization and Management of Capital Flows (IV) (IMF (2012), and IMF (2022a)). The IV rests on the premise that capital flows can provide significant benefits and thus are generally desirable. However, it also recognizes that unfettered capital flows can pose risks to macroeconomic and financial stability, providing a justification to use CFMs in certain circumstances albeit not as substitutes for warranted macroeconomic including exchange rate adjustment. The IV provides policy advice for the use of CFMs to help countries reap the benefits of capital flows while managing the concomitant risks.

This paper aims to provide evidence that multiple objectives are at play in the use of capital account restrictions.[1] They are (1) reaping the benefits of free capital flows through liberalization, (2) managing business or financial cycles, and (3) managing a currency and sovereign debt crisis. The analysis in the paper benefited from two novel datasets (see below) which complement each other in assessing the changes in the countries' restrictiveness.

[1] The paper uses the phrase "capital controls" or "capital account restrictions" to refer to restrictions that affect transactions that are covered under the financial account of the balance of payments statistics. We do not use the term "capital flow management measures" (CFMs) because the definition of restrictions on capital transactions in the AREAER database which is the basis for the discussion in this paper is different from the concept used by the IMF in the IV. See more in Annex III, footnote 29.

The paper has four main contributions to literature. First, in response to the IMF Independent Evaluation Office's (2020) call to construct capital flow restrictiveness indices based on the Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER), it offers two new indices of capital flow restrictions, covering a comprehensive set of countries at monthly and quarterly frequency. One measures the restrictiveness of capital accounts and another tracks changes (tightening/easing) in capital account restrictions. The datasets are novel in several aspects: both datasets include all IMF members (190), and are available at monthly and quarterly frequency, too. The financial account restrictiveness index (FARI) which measures the capital account restrictiveness of countries includes all 56 capital transactions listed in the AREAER[2] covering virtually all capital transactions of the Balance of Payments (BOP) in the highest available disaggregation, going well beyond other existing indices. The AREAER change index (ACI) includes all changes countries reported to restrictions on capital transactions with the actual date of the change. It allows the tracking of changes in restrictions on capital flows even in cases when the overall restrictiveness of a country does not change, which facilitates a more accurate measurement of countries' policy responses to changes in capital flows or other macroeconomic or financial sector developments. The indices refrain from subjective judgment on the intensity of the measures thereby aiming to provide an objective indicator of restrictiveness and any changes to it. Both indices will be made available every year when the yearly update of the AREAER is published on the publicly accessible AREAER website.[3] These are the first indices created by a team that is intimately familiar with the structure of the information in the AREAER having worked on the yearly update and the development of the database extensively.

Such indices are useful for economic research, including to analyze policy response to capital flows and the use and effectiveness of capital controls. Our indices are comprehensive in their coverage with respect to country and capital flow measures and extend for 24 years. Furthermore, subcomponents of the indices (portfolio inflow/ outflow, FDI inflow/outflow etc.) corresponding closely to the types of BOP flows allow researchers to more accurately match capital flows and related macroeconomic or financial sector developments with the indices which are most directly related to their analysis. Researchers will appreciate the quarterly and monthly availability of the indices which will facilitate consistency of analysis with corresponding economic data.

Second, it offers a set of novel stylized facts on capital account restrictions, which deepens understanding on how countries use and liberalize capital controls. In addition to well-documented facts on capital account liberalization by income or regional groups (see for example Quinn (1997), Chinn and Ito (2008) and Fernandez and others (2016)), the comprehensiveness of the underlying transactions included in the indices helps provide evidence that capital account liberalization has slowed or even reversed among some emerging economies in the last decade, and that the pace of liberalization differs across types of capital account transactions. There is also clear evidence for gradualism in capital account liberalization, especially of outflows. In documenting these facts, the paper relies on both existence-based and change-based indices of capital account restrictions, which—given their complementarities—provide more accurate results compared with previous approaches in the literature that use only one type of restrictiveness index for a large number of countries.

[2] The AREAER is a publication of the IMF which includes the description of IMF member countries' exchange rate, trade, current and capital account regimes.

[3] The indices will be published on the AREAER website: https://www.elibrary-areaer.imf.org/Pages/Home.aspx. While this paper covers indices for 190 members as of end 2022, indices data for 2023 onward will cover 191 member countries with the addition of a new IMF member in 2024.

Third, the paper offers evidence that countries use capital controls opportunistically. Regression analysis confirms that there has been a trend toward liberalization of capital accounts in the last three decades, with economic and institutional factors playing a role, including income level, participation in international agreements, institutional quality, depth of the financial system, and the exchange rate regime. At the same time, regressions also confirm that countries implement capital controls to tame cyclicality related to capital flows and in response to currency and sovereign debt crises.

Finally, the paper sheds light on an empirical disagreement in the literature on the cyclical use of capital controls. Some papers find no evidence that capital controls are used in reaction to macroeconomic developments (see for example, Eichengreen and Rose (2014), Fernandez and others (2015), Gupta and Masetti (2018), Forbes and Klein (2015)), while others document higher propensity to recalibrate capital controls when faced with macroeconomic and capital flow volatility (see Binici and Das (2021) and Aizenman and Pasricha (2013) among others). Using a new data set that covers a large set of countries beyond EMEs known for frequent use of capital controls, our analysis indicates that when inflow controls are tightened, they are implemented countercyclically, reacting to overheating, currency overvaluation, housing market booms, or financial stability concerns, with exact concerns varying across countries. We also highlight that a relatively limited number of countries rely on adjusting their capital account regulations along economic cycles.

The rest of the paper is organized as follows. The next section introduces the new indices of capital account restrictions. The third section presents stylized facts about the use of capital account restrictions based on the new indices, which are empirically tested in the fourth section. The final section concludes.

II. Constructing AREAER indices

We construct two sets of novel indices, one measuring the restrictiveness of capital transactions and the other tracking changes to capital flow restrictions. All information is sourced from the IMF's AREAER database that contains detailed information of *de jure* controls on capital transactions. The dataset in this paper covers 190 countries and economic territories from 1999 through 2022.[4] The main indices are accompanied by subindices for inflows and outflows, and with a breakdown by type of balance of payment flows (direct, portfolio, derivatives, and other investments flows). The indices will be updated annually on the IMF website as the new volume of the AREAER is published. Annex III provides detailed description of the index compilation.

1. AREAER Financial Account Restrictiveness Index

The first index—*AREAER financial account restrictiveness index* (FARI)—calculates the share of underlying capital transaction categories subject to controls, as reported in the AREAER. Specifically, it utilizes a binary variable across subcategories of capital transactions indicating whether a country imposes controls, and is constructed as follows:

$$FARI_{jt} = \frac{1}{N}\sum_{i=1}^{N} x_{ijt}$$

[4] The underlying binary data for constructing the restrictiveness index is not readily available prior to 1999. Backward extension to 1995 could be possible but would require effort to fill in the missing status values (see Annex III).

where x_{ijt} is either 0 or 1 for category i, for country j, at time t, and N is the total number of subcategories with zeros or ones. Therefore, $FARI_{jt}$ ranges from 0 to 1, with a larger value indicating a more restrictive capital account system.

The benchmark FARI is constructed as a broad index and hence includes controls on a wide variety of capital flow categories—virtually all capital transactions included in the BOP. It covers a total of 56 categories/subcategories included primarily in the capital transactions section of the AREAER (such as FDI, equity, bonds, money market, etc.). In addition, it also includes categories covering resident accounts, nonresident accounts, and controls such as repatriation and surrender requirements. Two other indices are constructed focusing on inflows and outflows, respectively. The 56 categories of controls are classified as either affecting inflows or outflows in line with the balance of payment methodology, resulting in the FARI Inflow index based on 30 inflow-related categories and the FARI Outflow index based on 26 outflow-related categories. We further construct four subindices in line with broad categories in the financial account of the balance of payments statistics: FDI, portfolio investments, financial derivatives, and other investments. Corresponding inflow and outflow indices are also calculated. See Annex III Table 1 for the grouping of AREAER categories, as far as possible, into their BOP classification. Since the intention is to construct a broad index of restrictiveness, the aggregate FARI Inflow and FARI Outflow indices, where no weights are applied to the underlying transactions, may be most useful to users. In the next section, we show the trends in the subindices to facilitate economic interpretation of the aggregate indices.

The index of capital account restrictiveness based on the binary indicators from the AREAER has a long history, dating back to the pioneering work of Johnston and Tamirisa (1998) which utilized the AREAER's extension of the tabular format to subcategories in 1997.[5] The approach was subsequently adopted and extended by various papers, and the index developed by Fernandez and others (2016) is a recent and widely used successor. The financial openness index by Chinn and Ito (2008) is also a popular index among researchers, but their index differs from the others in its use of binary indicator at the aggregate category for capital account transactions and its coverage of policy measures beyond capital account transactions.

Our index complements and improves the existing indices based on the binary indicator in several aspects. Firstly, it has more comprehensive coverage of capital account transactions and hence better correspondence with balance of payment categories. Most importantly, the index includes not only the standard portfolio and direct investment categories but also controls on nonresidents' ability to open and operate foreign or domestic currency accounts in the country and residents' accounts abroad,[6] as well as surrender and repatriation requirements. These are important transactions often subject to controls to limit rapid movements in capital flows or to ensure the effectiveness of other capital controls but generally dismissed by the existing indices. Second, the index is adjusted for known database issues inherent in the AREAER's binary indicators. These include a structural break in the binary indicators for Organization for Economic Co-operation and Development (OECD) countries in 2005, and differences in reporting period across countries (see Annex III for details). Third,

[5] They built an index for 45 countries that treated subcategories of transactions separately, depending on the direction of capital flows. However, the index was constructed only for 1995.

[6] The capital account transaction categories included are the ability of residents to open and maintain bank accounts abroad in foreign or domestic currency, and the ability of nonresidents to maintain bank accounts in the local economy in FX or local currency. The liberalization of the former is an indicator of outflow liberalization while the latter indicates liberalization of inflows. Permitting residents to maintain accounts abroad in domestic currency, in particular, indicates a high degree of liberalization as part of allowing the external use of domestic currency.

the index minimizes subjective judgement on the binary indicators[7]. Fourth, we create quarterly and monthly indices, which is an important improvement to the existing ones which have been constructed without exception as yearly indices. To construct the quarterly and monthly indices, we utilize information on the effective date of change in the binary indicator whenever available and the date of reporting. These indices allow better matching of the restrictiveness of a country's capital control regime with economic data which are available at monthly or quarterly frequency. Fifth, the index covers all IMF member countries unlike several other indices that include only selected countries. Finally, the index will be updated yearly and made publicly available with the yearly update of the AREAER.

Our index is similar to other indices based on the AREAER to the extent that it does not measure the intensity of the controls and their enforcement.[8] Because of the "on" or "off" nature, all controls have the same value in the index, whether they prohibit the transactions or impose a tax, set a ceiling, or subject the transaction to authorities' approval. Similarly, the value of the index remains the same whether the controls apply to all transactions or only a limited set of transactions of the same category of capital transactions. To overcome this constrain we have created another index, the ACI (see below) which measures changes in the level of restrictiveness even when the capital flow category remains controlled.

Some alternative indices have been proposed to overcome this drawback and have been constructed to explicitly measure the intensity of capital controls (IMF 2010). These include Quinn (1997) and Quinn and Toyoda (2008), who assign values ranging from 0 to 2 in increments of 0.5, depending on the extent of restrictions. Although restrictions on inward flows and outward flows are coded separately, they do not differentiate among the types of transactions. Montiel and Reinhart (1999) also incorporate the intensity of capital controls by assigning a value of zero, 1, or 2, based on the strictness of limits on capital flows and foreign exchange exposures (such as prohibitions, deposit requirements or taxes) for 15 emerging economies during 1990–96. Recent work by Bergant and others (2025) use large-language-model methods to extract structured information from narrative text and capture restrictions beyond those in the capital account while accounting for recalibrations of policies since the 1950s.

While these indices that aim to reflect intensity of controls may do a reasonable job of capturing gradual changes in capital account restrictions or the policy stance by assigning values to the relative importance of the controls on capital flows, by design they bring in subjective judgment of the respective authors in the construction of the indices which may affect the overall results. The FARI by design aims to avoid subjectivity

[7] The binary indicators reflect the information provided by the authorities. These are changed by the team compiling the AREAER if the description of the measure indicated by the authorities is clearly a capital control as per the definition in the AREAER. In case of doubt, the team clarifies the details of the measure with the authorities and makes a decision on the binary indicator based on that. No additional adjustments are made to the binary indicators for the compilation of the indices.

[8] The binary ("yes" or "no") status in the AREAER only distinguish between the existence of controls or the lack of controls on certain capital flow categories. It does not allow for measurement of the capital controls' intensity or their coverage nor their gradual liberalization or intensification within a capital transaction category (IMF 2010). Enforcement of the controls has considerable impact on the restrictiveness of the transaction. Often, actual implementation of the controls differs from the measures as described in the relevant laws and regulations, either setting more stringent conditions or not enforcing the controls at all, rendering the de jure controls ineffective. Similarly, the absence of controls may not necessarily imply that no measure exists in practice (for example if a country provides FX only for current payments, then all capital transactions are de facto controlled despite the absence of formal capital control regulations). Therefore, some researchers use a de facto measure related to the actual capital flows. One commonly used measure is the sum of external assets and liabilities with respect to GDP (Lane and Milesi-Ferretti, 2018).

and provides an objective measure of restrictiveness.[9] In addition, by including comprehensive coverage of the disaggregated underlying transaction categories reported in the AREAER, our aggregate indices (including those for inflows and outflows) are better able to capture partial liberalization and tightening in practice. As shown below, our indices result in high cross-country correlation with other indices even with those that use more labor-intensive coding rules (for instance Quinn and Toyoda (2008)). Furthermore, to overcome the weakness where changes (easing or tightening) in controls are not adequately captured by FARI and similar indices, we propose indices based on the changes section of the AREAER (see next part in this section).

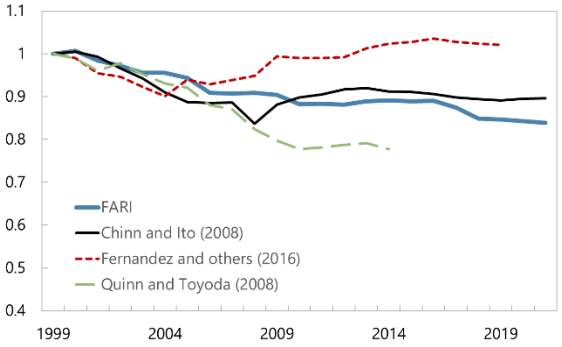
The resulting index has strong correlations with existing AREAER based indices. We compare the FARI to three popular AREAER based indices using a simple panel regression in Table 1. Not surprisingly, a high overall R-squared value suggests that the aggregate FARI is most strongly correlated with the Fernandez and others (2016) index, because both indices are constructed in a similar way with different coverage of underlying categories[10]. Chinn and Ito (2008) and Quinn and Toyoda (2008) indices find somewhat lower values of R-squared. However, these high overall R-squared values mainly reflect a high correlation in variations between countries, as the high "between" R-squared values suggest. In contrast, "within" R-squared implies a lower correlation over time for a given country. In other words, the AREAER based indices show a similar picture of restrictiveness across countries in a given year, while they tend to show different trends. For illustration, Figure 1 reports the average indices across countries over time. It shows heterogeneous trends in restrictiveness implied by the existing indices, which reflects differences in the construction of the indices. Compared to FARI, the index by Fernandez and others (2016) covers narrower set of capital transactions, in particular it does not include transactions where major liberalization happened (see the section on stylized facts), the index by Chinn and Ito (2008) covers wider categories as it includes current account transactions too, and the index by Quinn and Toyoda (2008) considers a subjective ranking of the intensity of controls in place.

Table 1. Correlation with Other Indices

	Fernandez and others (2016)	Chinn and Ito (2008)	Quinn and Toyoda (2008)
FARI	1.031***	0.726***	0.696***
	(0.048)	(0.085)	(0.050)
Constant	0.053***	0.192***	0.272***
	(0.015)	(0.033)	(0.017)
# observations	2100	4057	2121
# countries	100	181	126
R-squared			
Overall	0.90	0.77	0.79
Within	0.64	0.28	0.45
Between	0.94	0.83	0.79

Sources: Authors' calculations.
Notes: Table reports coefficients from regression of existing de jure indices on FARI using fixed effect estimation. Robust standard errors are reported in parenthesis. Indices are all adjusted to show a higher value indicating higher restrictiveness.

Figure 1. FARI vs Other De Jure Indices



Sources: Authors' calculations.
Notes: Chart shows the simple averages of indices by year. Indices are normalized at 1 in 1999 and adjusted to have higher value indicating a more restrictive framework. Country coverage differs by indices.

[9] Despite the absence of subjective judgment, complete objectivity is difficult to achieve. Attributing different weights across categories or measures based on their relative importance as determined by the author of the index clearly introduces subjectivity, but attributing equal weights as included in the AREAER might also be considered as introducing an element of subjectivity.

[10] The Fernandez and others (2016) index also includes certain adjustments which introduce some subjective judgment and thus are absent from the FARI.

2. AREAER Change Index

The second index—*AREAER change index (ACI)*—counts the number of new measures to capital transactions in a given period in a given country. Information is taken from the table of changes, which is reported at the end of each country chapter in the AREAER and contains information on the date on which a measure became effective along with a short description of the measures. We first code every change reported in the table relevant for the ACI as easing, tightening or neutral,[11] then it is further coded as a measure affecting capital inflow, outflow or both. As a result, we identify 3,968 easing changes, 1,392 tightening changes, and 771 neutral changes covering all countries in the AREAER over 1999 - 2022. Since the changes are recorded by exact date when they became effective, we sum up the number of daily tightening and easing changes into monthly, quarterly, and annual ACI for the sample period.

The index covers essentially the same set of main categories as those used to construct FARI. However, unlike FARI that utilizes binary variables assigned to the most disaggregated transaction subcategories, ACI counts only changes aggregated to the main subheadings level because historically this is how the changes were recorded in the AREAER database until the 2016 AREAER. While this reporting format changed starting with the 2017 AREAER, with changes reported under each subcategory, in calculating the ACI we consider the changes for data post-2017 as done historically to ensure a consistent time series. If this was not done, we would end up with an unbalanced number of changes before and after the 2017 AREAER. Changes are still counted multiple times if they affect different asset categories (see Annex III).

While the two indices (FARI and ACI) are constructed to maintain comparability of underlying transaction types, there are important differences in what they capture. A relaxation or easing of a restriction does not necessarily lead to a lower FARI. Since the FARI is based on a binary value, it only changes when the binary value changes from “yes” to “no” or vice versa. Hence, only if a restriction is eased such that it results in the complete elimination of all restrictions on the respective transaction would it lead to a change in the status from “yes” to “no” implying no restrictions in that category. In that case it would lead to a lower FARI since there will be one less “yes” status in the numerator in equation (1). There are also cases when the FARI value changes (i.e. the binary status is reported either switched from “yes” to “no” or vice versa compared to the previous year) without the corresponding change reported in the table of changes in the country chapter. Therefore, not all changes in the table of changes result in a change in FARI and not all changes in FARI can be linked to changes reported in the table of changes.[12]

This capital control index is the first with this wide coverage of asset categories, countries, and time periods. There are a few existing indices that are constructed similarly, but they are usually focusing on selected countries. Such indices are relatively more recent and include Baba and Kokenyne (2011) for 4 countries in the 2000s. They supplement changes in capital controls as reported in the AREAER with a price-based inflow control index to capture intensity. Pasricha (2017) for 21 emerging economies for the period 2001 - 2015 and Pasricha and others (2018) for 16 emerging economies (subsequently expanded to cover 45 economies for the

[11] Neutral measures were changes that could not be classified as easing or tightening of restrictions and did not discriminate by residence or currency. As far as possible, measures that were taken previously and were extended were also labeled as neutral to avoid counting the same measure more than once.

[12] In the absence of any information to the contrary, the AREAER accepts the binary indicator provided by the country authorities who are the best positioned to determine if a specific transaction included in the index is controlled or not, which reduces the risk of mistakes in the binary indicators. That said, if later the binary indicator turns out to be incorrect, the AREAER retroactively corrects the relevant indicator, and it is reflected in the FARI as well.

period 2001-2015), supplement the information on regulatory changes from the AREAER with additional information from press releases, circulars and notifications on the regulators' and finance ministries' websites, OECD reports, news sources as well as other research papers. In addition, Pasricha and others (2018) calibrate their measure for intensity by decomposing the action into several categories and weighing the changes by the share of the country's total international assets or liabilities that the measure is intended to influence. Binici and Das (2024) use the IMF's taxonomy of capital flow management measures to construct a database of 469 CFMs that are "macro-critical", between 2008 and 2021 for 49 countries. They identify whether the measures are tightening, easing or stable and supplement the information in the IMF taxonomy with information from IMF country reports and central bank circulars to relate the measure to the corresponding BOP flow that the CFM was targeting. They also approximate the intensity of the measure using weights derived from BOP data. Forbes and others (2015) document weekly changes in CFMs for a sample of 60 countries during 2009-2011. They primarily rely on the AREAER and supplement it with information from financial analyst reports, primary news sources, and academic papers on capital controls and macroprudential measures. Their database includes 220 CFM events, and they differentiate inflow and outflow controls along with whether the measure increased/added (tightening) or decreased/removed (easing) control.

Broadly speaking, the four main ACI show similar trends as Pasricha and others (2018) (Annex IV). We plot the total changes for each year for both sets of indices for the 45 economies and the aggregate trend is broadly similar. While Pasricha and others (2018) who supplement the AREAER data with other sources show more changes in some years, the ACI reflects more changes in some other years. Furthermore, as first in the economic literature to our knowledge, the ACI offers change-based index for all the economies covered in the AREAER database.[13]

III. Stylized Facts about Capital Account Restrictions

Using the two types of indices, we document stylized facts about the use of capital flow restrictions over the past two decades. Countries are grouped by their region and income as of end-2022.[14]

1. Aggregate trends

Countries generally made their capital account frameworks more liberalized over the last decades, with inflow transactions remaining more liberalized than outflow transactions. As Figure 2.1 shows, on average, overall

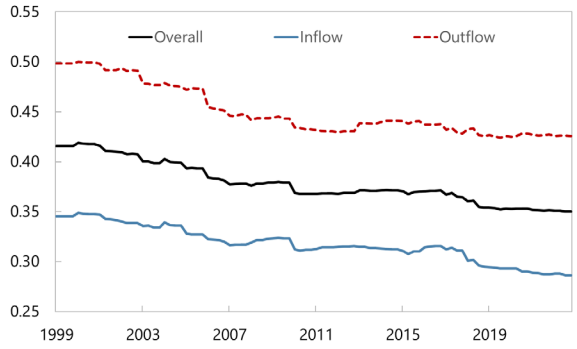
[13] There are common caveats to these indices based on policy changes. They do not necessarily measure policy intensity well including how much they are enforced by the authorities. In addition, they use the effective date of change in the policy instead of the date of their announcement, which may lead to ignoring market reaction between the announcement and effectiveness dates. Note however, that when capital controls are tightened, they usually become effective on the day of their announcement to limit potential for frontrunning reducing the concerns on disregarded market reactions.

[14] Specifically, "Advanced" economies correspond to IMF's classification for World Economic Outlook. "Developing" economies refer to the countries eligible to IMF's Poverty Reduction and Growth Trust (PRGT) facilities. The rest is classified as "Emerging" economies. Historical classifications as of end-2022 are used to match the last observations of our indices at the time of construction. Economies may be further grouped by region. See Annex II for a full list of countries by group.

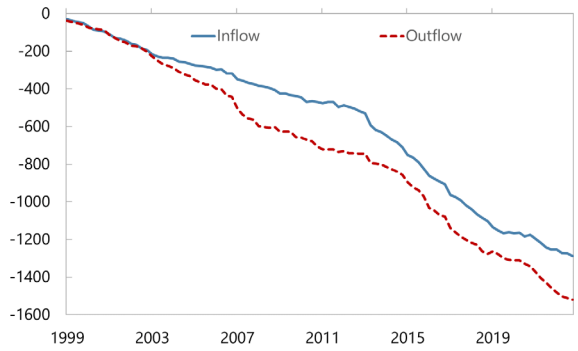
FARI dropped from 0.42 in 1999Q1 to 0.35 in 2022Q4, indicating that the share of capital transactions subject to controls has dropped by 7 percentage points. Inflow transactions are less controlled than outflow transactions on average by 14 percentage points, while the pace of liberalization is marginally faster for outflows than for inflows. Figure 2.2 confirms a broadly similar picture based on the number of changes. There have been consistently more easing measures than tightening measures, keeping the "net" number of easing measures positive throughout the sample period. There are slightly more outflow-related changes (51 percent) than inflow-related changes (49 percent), with liberalization measures representing about 75 percent of inflow-related changes and 80 percent of outflow-related changes.

Figure 2. FARI aggregates and ACI net changes, 1999Q1-2022Q4

1. Average FARI
(Index, 0-1)



2. ACI net cumulative changes
(Number of tightening minus easing measures)

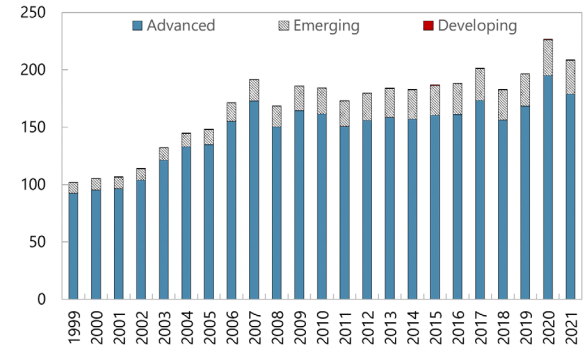


Sources: AREAER and authors' calculations.
Notes: Panel 1 reports unweighted average indices across all countries. Panel 2 reports the cumulative number of tightening changes, net of the number of easing changes, by the direction of flows.

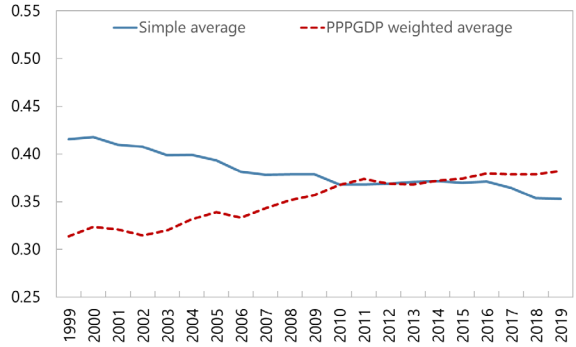
Despite continued liberalization in capital account frameworks, the growth of international financial integration has slowed since the GFC. Figure 3.1 shows that a measure of de facto financial openness—proxied by total assets per global GDP—has plateaued around 200 percent of global GDP since 2007. This slowing globalization in cross-border positions is similar to widely documented slowbalization in goods trade (see, for example, Aiyar and others, 2023). However, unlike the case for trade restrictions, no sharp rise in capital account restrictions can be observed in recent years. Rather, as argued by Lane and Milesi-Feretti (2018), this trend reflects weaker capital flows to and from advanced economies and an increase in the relative weight in global GDP of emerging economies that tend to have lower ratio of external assets and liabilities to GDP compared to advanced economies. In fact, if weighted by country size, average FARI shows a rising trend in restrictiveness (Figure 3.2), because of an increase in the weight of emerging economies that tend to have more restrictive frameworks than advanced economies, even though they have been continuously liberalizing (as implied by Figure 2.2). As such, the evidence for geoeconomic fragmentation from de jure information is so far limited to some FDI restrictions that we discuss later.

Figure 3. Financial Slowbalization

1. Global external financial assets
(Percent of Global GDP)



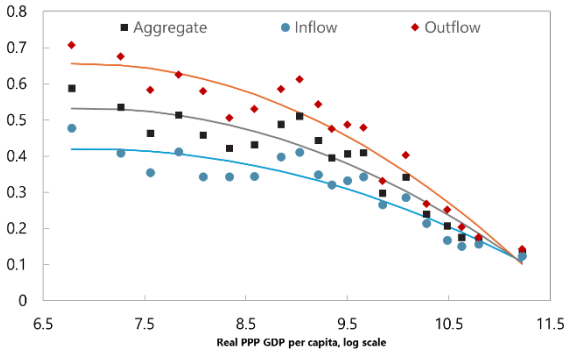
2. Weighted and unweighted average FARI
(Index, 0-1)



Sources: Lane and Milesi-Ferretti (2018), Penn World Table 10.01, AREAER and authors' calculations.
Notes: Panel 1 reports total external assets in relation to global GDP. Annual, 1999-2021. Panel 2 reports unweighted aggregate FARI and PPP GDP weighted aggregate FARI. Annual ,1999-2019.

Higher income economies tend to maintain a more liberalized framework. Figure 4 shows binned scattered plots between FARI and the income level with quadratic fitted lines. Downward lines indicate less restrictive capital account frameworks for higher income economies, confirming the evidence presented in the literature (for example, Quinn (1997), Chinn and Ito (2008) and Fernandez and others (2016)). In addition, lower income countries tend to have a wider gap between the restrictiveness of inflows and outflows, while the gap narrows as the income level rises. The patterns suggest gradual liberalization initially of inflows then of outflows, reaching near full liberalization when 10-15 percent of transactions categories remain subject to capital controls. These patterns reflect that countries aim to develop domestic economy and financial markets at their early stage of development by allowing more foreign funds (primarily FDI and loans) to enter the markets to complement often scarce domestic funds. As domestic financial markets develop, countries switch their focus to encouraging residents' investments abroad to better diverse risks in investments and ease pressure on exchange rate that capital inflows may cause.

Figure 4. FARI by income level

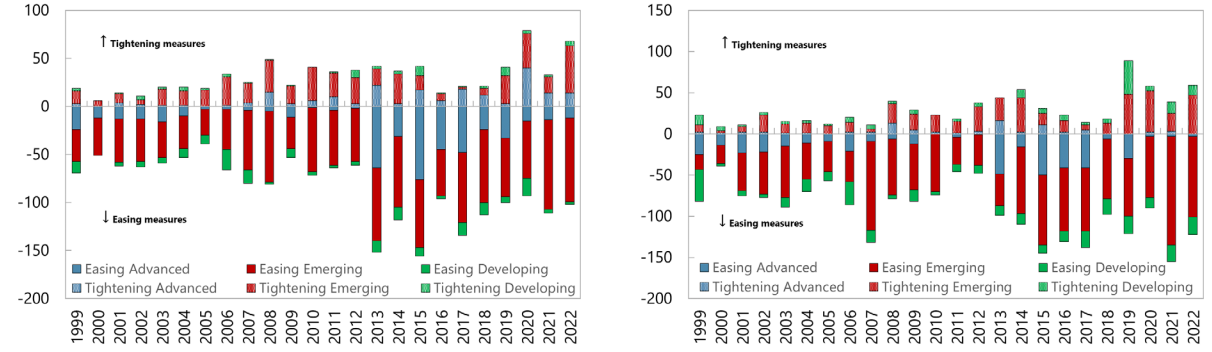


Sources: AREAER, Penn World Table 10.01, and authors' calculations.
Notes: Chart shows the binned scatter plot between FARI and the income level, estimated for aggregate, inflow and outflow indices respectively. The income level is measured by real PPP GDP divided by population. Underlying data covers 1999-2019, annually, for countries with PPP GDP data. The solid lines represent quadratic fits.

Emerging market economies have been traditionally most active in adjusting capital account regulations, while advanced economies have become more active recently. Figure 5 decomposes the number of changes by developmental groups. It shows that changes by emerging market economies, in particular liberalization changes, dominate the total number of changes throughout the years in our sample. This is consistent with more rapid progress in liberalization documented in Figure 4 for countries around the middle of income distribution. However, in 2022 there was an uptick in tightening measures as both Russia and Ukraine

tightened controls because of Russia's invasion of Ukraine, while Argentina did so due to its economic situation. In addition, Figure 5 also indicates that changes by advanced economies have increased sharply from around 2013 for both inflow and outflow transactions. This largely reflects lifting of crisis-related capital controls in some countries in Europe (see more discussion in the following), and liberalization associated with bilateral and regional trade agreements among advanced economies. An increase in inflow tightening measures by advanced economies post GFC is also notable; this reflect a confluence of factors, including real estate related measures (such as stamp duties, fees and taxes on real estate purchases by nonresidents) introduced in efforts to stem housing price pressures, and newly introduced or tighter screening of FDI by EU member countries in 2020 in the context of rising geopolitical concerns. Finally, developing countries report relatively lower number of changes throughout the period (except in 2019 when BEAC countries tightened repatriation and surrender requirements). This could indicate less need for adjusting capital control policies given the level of domestic capital market development or choice of monetary and exchange rate arrangement. Note that some of these countries, in particular in near-crisis situations, occasionally control capital flows without formal capital controls by providing access to FX only for certain current transactions and effectively restricting capital transactions.

Figure 5. ACI by developmental group, 1999-2022



Sources: AREAER and authors' calculations.
Notes: Charts display number of changes in a given year by developmental group. Easing changes are shown in negative numbers, while tightening changes are shown in positive numbers.

Looking across types of capital transactions, direct investments into the economy and portfolio investments abroad are the most controlled transactions with limited liberalization over time (Figures 6.1 and 6.2). High restrictiveness for direct investment inflows may appear contradictory to the perception of benefits and low riskiness of FDI. In practice, while countries usually start their capital account liberalization with FDI, they tend to maintain selective controls on direct investments for non-economic reasons, even after they achieve nearly full liberalization. For example, it is common that foreign investors are barred from investing into some industries for national security reasons.[15] As a result, FARI for direct investment inflows is relatively high across all income levels, including among high income countries that tend to have more liberal frameworks for all other

[15] Such measures are usually ignored in the index by Fernandez et al. (2016) resulting in a less restrictive FDI level. However, the corresponding adjustment in the binary indicator introduces a level of subjectivity in the index.

capital flows (Figure 6.3).[16] Outward direct investments are similarly restricted, but there has been more liberalization over time and as income level rises (Figures 6.2 and 6.4). Portfolio outflows are highly restricted among most emerging and developing economies, more so than portfolio inflows are. It is also noteworthy that there is limited progress in liberalizing both portfolio inflows and outflows over the last two decades. This may reflect increasing recognition by regulators of the riskiness of portfolio flows, which are often associated with hot money swiftly reacting to global market conditions. Other investments are the least controlled inflow and outflow transactions, and their liberalization drove overall liberalization trends over the last two decades (Figure 6.1).[17] Other investments inflows are less restricted even among lower income countries which otherwise feature a rather restrictive capital account regime (Figure 6.3). This reflects low restrictiveness of nonresident account transactions as these accounts aim to provide a convenient channel for capital inflows by allowing nonresidents to freely repatriate FX transferred to an account in the country to facilitate mostly current account transactions.

The number of changes paint a slightly different picture and indicates that liberalization progressed across all capital transaction categories. Figures 6.5 and 6.6 show total numbers of changes reported in a given year by all countries in our database by direction of the changes. The number of easing measures outweighs that of tightening measures, including for direct investment and portfolio flows for which FARI finds limited liberalization over time. This suggests that there has been gradual liberalization which is not fully captured by the binary indicator on existence of controls. Changes concerning other investment flows outnumber other types of capital flows, which partially reflect that “other investment” categories cover a greater variety of transactions than the others.

Closer look at the changes by transaction category reveals shifts in focus of capital account policies. Many of the direct investment liberalization measures were taken by EMs throughout the period, while some advanced economies also eased controls (for example Australia in 2015) with some done in the context of bilateral and regional trade agreements. On the tightening side, there was a notable rise in controls due to real estate and FDI screening measures in the recent decade as we have discussed previously. For portfolio flows, many liberalization measures in early to mid-2000s reflect preparation for EU accession by newer EU members (such as Croatia, Cyprus, Czech Republic, Malta, Slovakia, Slovenia). In years preceding the GFC, however, controls on portfolio inflows were introduced by some EMs, including Thailand, Colombia, Russia, Vietnam, Brazil to deal with inflow pressures, while outflow controls were liberalized by many (see Habermeier and others, 2011). A similar trend continued after the GFC in the context of ample global liquidity. Portfolio inflows were often subject to temporary capital controls that were adjusted frequently after their introduction (some were lifted, others were kept with modification), contributing to the number of changes in both directions. In addition to these controls to manage capital inflows, controls on portfolio inflows and outflows were also used during economic crises, for example by Iceland, Cyprus, Greece, Argentina, Ukraine, Sri Lanka. The number of

[16] Similarly to the majority of the indices which do not assess the relative importance of the measures in the economy, neither FARI nor ACI weigh by the type of control, hence it does not consider how restrictive the measures introduced on FDI are. That said, while LICs FDI controls may be perceived more distortionary than those advanced economies maintain, comprehensive FDI screening systems may also be discretionary.

[17] The low restrictiveness of “Other outflows” in part reflects the inclusion in this subindex of resident accounts and repatriation and surrender requirements; both have somewhat lower restrictions than credit outflows. However, the correlation over time and cross-countries between restrictions on credit outflows and repatriation and surrender requirements is high, hence the inclusion of the latter in the “Other” subindex should not be an issue. While repatriation and surrender requirements could affect more than one BOP flow category, it is included in “Other” subindex since it is not possible to map AREAER categories fully with BOP statistics category (see also Annex III).

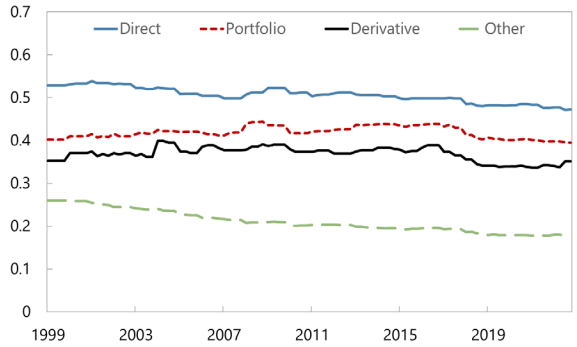
changes related to derivative transactions is smaller compared to that for other transactions, but the underlying trends are similar to those for portfolio flows.

While there are numerous changes reported under the other capital flow categories, the main drivers appear similar to those mentioned above, namely the trend of general liberalization and the use of temporary controls to manage excessive capital flows and crisis. About a third of the changes are related to account transactions. In particular, about half of the changes in nonresidents accounts represent crisis-related account measures (such as deposit withdrawal limits) imposed, adjusted, and ultimately lifted by crisis-hit European countries (Iceland, Cyprus, Greece, Ukraine). Another sub-group that includes several inflow changes is related to bank provisions. Many EMs, especially those in Latin America and Caribbean region including Peru, Uruguay, and Haiti, adjusted reserve requirements for foreign currency deposits, and, in some cases, for nonresident deposits. Some EMs in Europe (such as Serbia and Croatia) also adjusted reserve requirements on external borrowings. Many of these measures were implemented to deal with risks from excessive changes in external liquidity, hence eased and tightened over time. Other policy tools were used in a similar context, for example a position limit on derivatives in Colombia and a capital flow tax in Brazil. On the outflow side, changes concerning surrender and repatriation requirements of proceeds from exports and external transactions are most prevalent. About a third of outflow easing changes represent relaxation or elimination of repatriation and/or surrender requirements, and they were undertaken by a wide range of countries (including developing countries such as Sudan, Botswana, Burundi, Pakistan, and EMs such as Hungary, Guatemala, Czech Republic, Egypt, Seychelles, among many others). At the same time, crisis or near-crisis countries tend to introduce or tighten surrender and repatriation requirements. Examples of countries that resorted to surrender/repatriation requirements around the period of currency crisis include Kazakhstan, Zimbabwe, Argentina, Iceland, Belarus and Ghana.

Figure 6. FARI and ACI by transaction category, 1999Q1-2022Q4

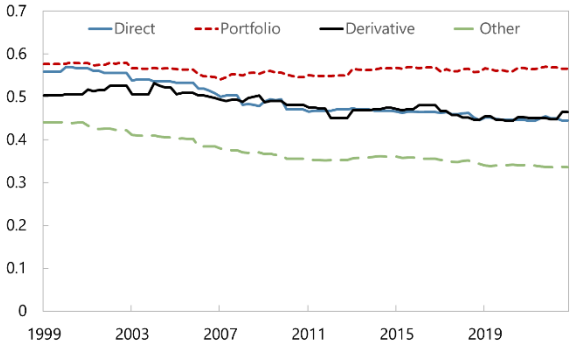
1. Average Inflow FARI

(Index, 0-1)



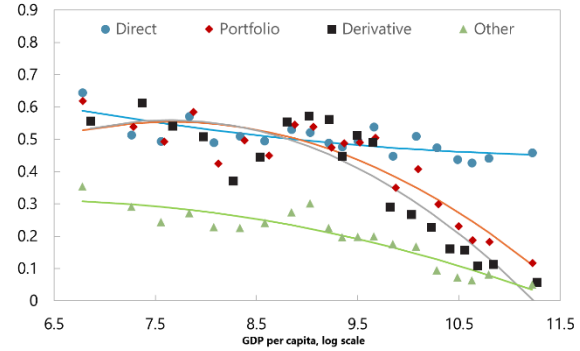
2. Average Outflow FARI

(Index, 0-1)



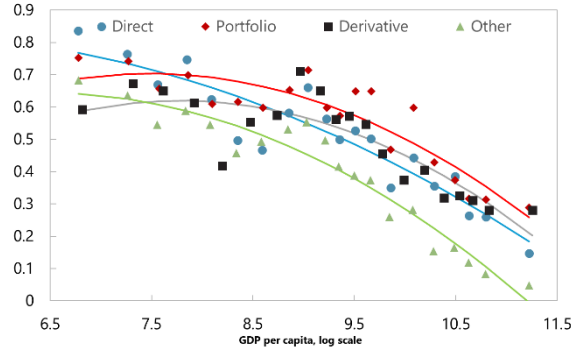
3. Inflow FARI vs income level

(Index, 0-1)



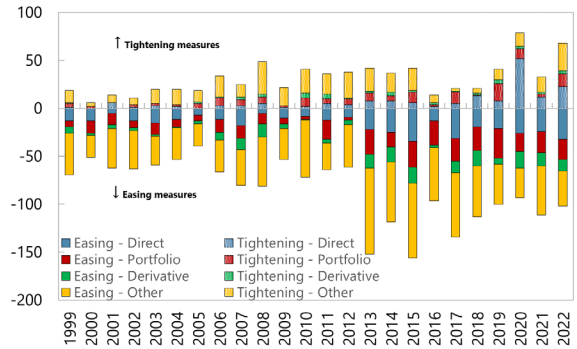
4. Outflow FARI vs income level

(Index, 0-1)



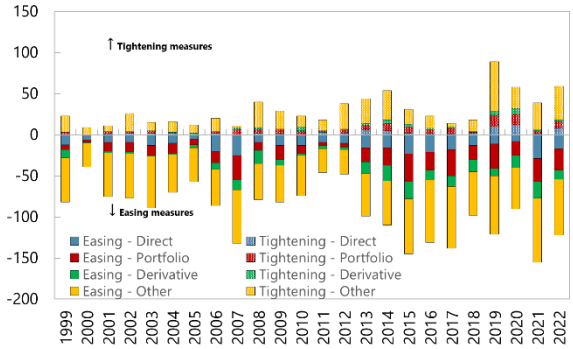
5. Number of Inflow Measures

(Annual number of changes. Negative = Easing changes)



6. Number of Outflow Measures

(Annual number of changes. Negative = Easing changes)



Sources: AREAER, Penn World Table 10.01, and authors' calculations.

Notes: Panels 1-2 report unweighted average FARI indices across all countries by type of capital transactions, for inflows and outflows respectively. Panels 3-4 show the binned scatter plots between FARI and the income level by type of capital transactions, for inflow and outflow respectively. Underlying data covers 1999-2019, annually, for countries with PPP GDP data available. The solid lines represent quadratic fits. Panels 5-6 display number of changes in a given year by type of capital transactions. Easing changes are shown in negative numbers, while tightening changes are shown in positive numbers.

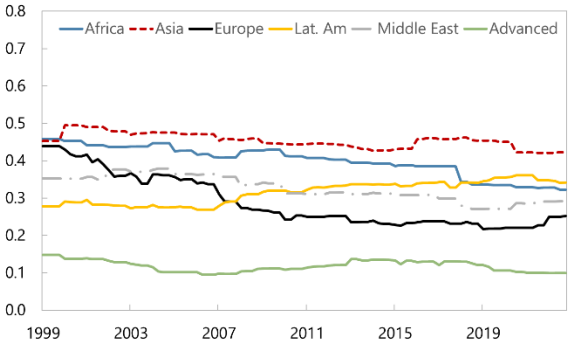
2. Regional and country level trends

Across regions, trends are heterogeneous, with the restrictiveness having increased modestly after the GFC in some regions. Figures 7.1 and 7.2 indicate that Latin America and the Caribbean (LAC) countries have maintained overall tighter frameworks after the GFC. The partial reversal of capital account liberalization in LAC persisted through the end of the sample period and is more pronounced for inflows. In part, this reflects the use of capital controls to manage capital flow volatility that started before the GFC, as we have discussed previously. Consistently, Figures 7.3 and 7.4 suggest implementation of inflow tightening measures by LAC countries between 2007 and 2013. In the other regions, Figures 7.1 and 7.2 show that the overall restrictiveness has decreased or remained about the same compared to the levels around 2000, while some regions experienced periods of more restrictive capital accounts. In two groups, namely emerging and developing countries in Asia and Europe, the liberalization trend slowed after the GFC. In Europe, it reflects the end of EU accession waves in the mid-2000s. In Asia, the use of capital controls targeting real estate transactions and portfolio flows has increased. In advanced economies, the restrictiveness for both inflows and outflows increased since the GFC and gradually reversed by the late 2010s, largely representing crisis-hit countries, such as Iceland, Greece and Cyprus, which introduced and later lifted controls on various types of capital transactions. They indeed account for a sizable share of changes between 2013 and 2019, as Figures 7.3 and 7.4 show. On the other hand, some countries in Central Asia and Africa undertook general liberalization of their capital accounts, contributing to a downward trend in restrictiveness in these regions.

Figure 7. FARI aggregates and ACI net changes by region, 1999Q1-2022Q4

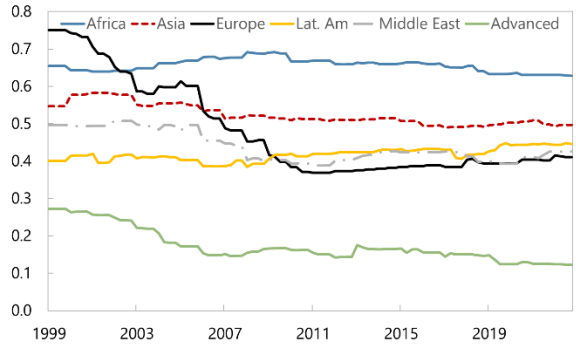
1. Inflow FARI by region

(Index, 0-1)



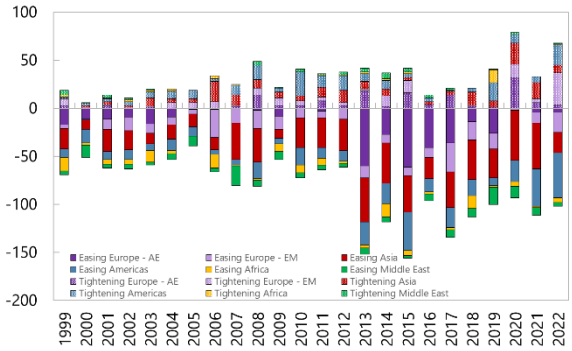
2. Outflow FARI by region

(Index, 0-1)



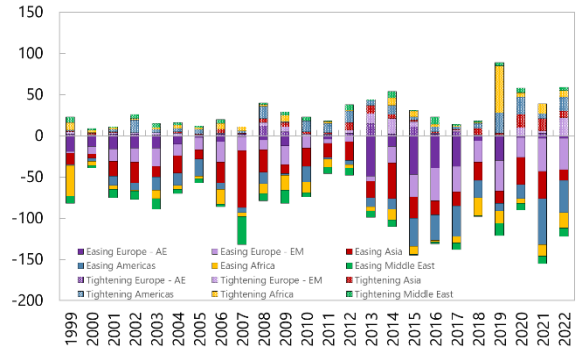
3. Number of inflow measures by region

(Annual number of changes. Negative = Easing changes)



4. Number of outflow measures by region

(Annual number of changes. Negative = Easing changes)

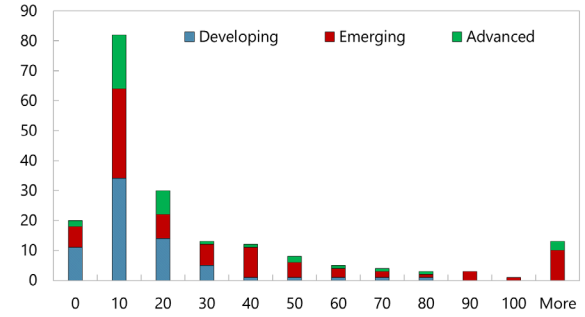


Notes: Panels 1 and 2 report unweighted average FARI across emerging and developing economies by region. Advanced economies are grouped together regardless of their geographical locations. "Lat. Am" represents Latin America and Caribbean countries. Panels 3 and 4 display number of changes in a given year by regional group. Advanced economies are included in their respective geographical group, except those in Europe that are reported separately. Easing changes are shown in negative numbers, while tightening changes are shown in positive numbers.

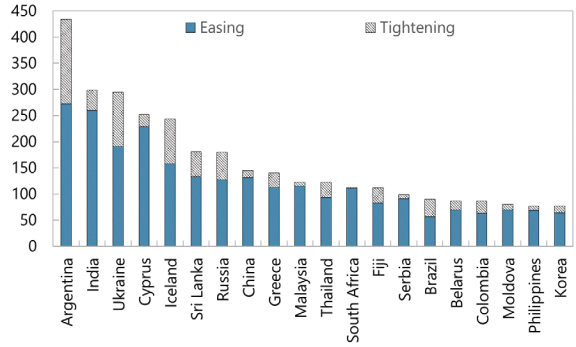
Countries widely differ in their approach to implementing changes in capital account restrictions. As shown in Figure 8.1, about half of the countries implemented fewer than 10 measures over the 22 years of our sample period, and 70 percent of the countries have less than one change per year (or fewer than 22 changes in total). Most developing economies and advanced economies fall in this category. However, about 10 percent of the countries implemented more than 70 measures during our sample period. Figure 8.2 suggests these are a mix of countries that experienced economic crisis (Argentina, Cyprus, Ukraine, Iceland, Greece) and those that follow a path of gradual liberalization (India, Sri Lanka, Malaysia, China, South Africa, Thailand, Fiji). Some of the latter countries still maintain an elaborate system of capital controls which is gradually eased upon reaching the necessary preconditions for the removal of controls, while some actively use the remaining controls to achieve domestic economy and financial stability objectives. We empirically explore the motivations for capital controls in the following section.

Figure 8. Frequency of Changes by Country

1. Distribution by total number of changes
(Number of countries)



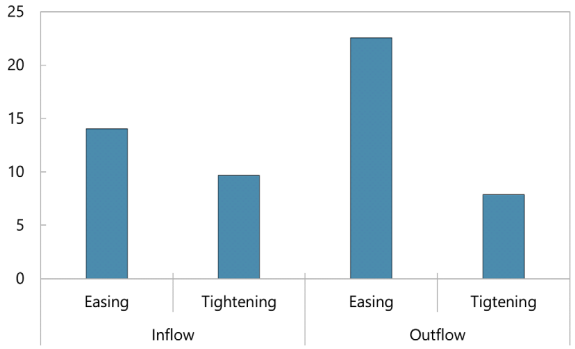
2. Top 20 countries by total number of changes
(Number of changes)



Notes: Panel 1 shows a histogram of countries based on the total number of changes between 1999 and 2022. Panel 2 lists top 10 percent (20) countries based on the total number of changes for the period 1999-2022.

Figure 9. Number of Changes per Cumulative Restrictiveness Change

(Ratio, Median values)



Notes: Median values of the number of ACI changes for 1999-2022 divided by the cumulative change in FARI.

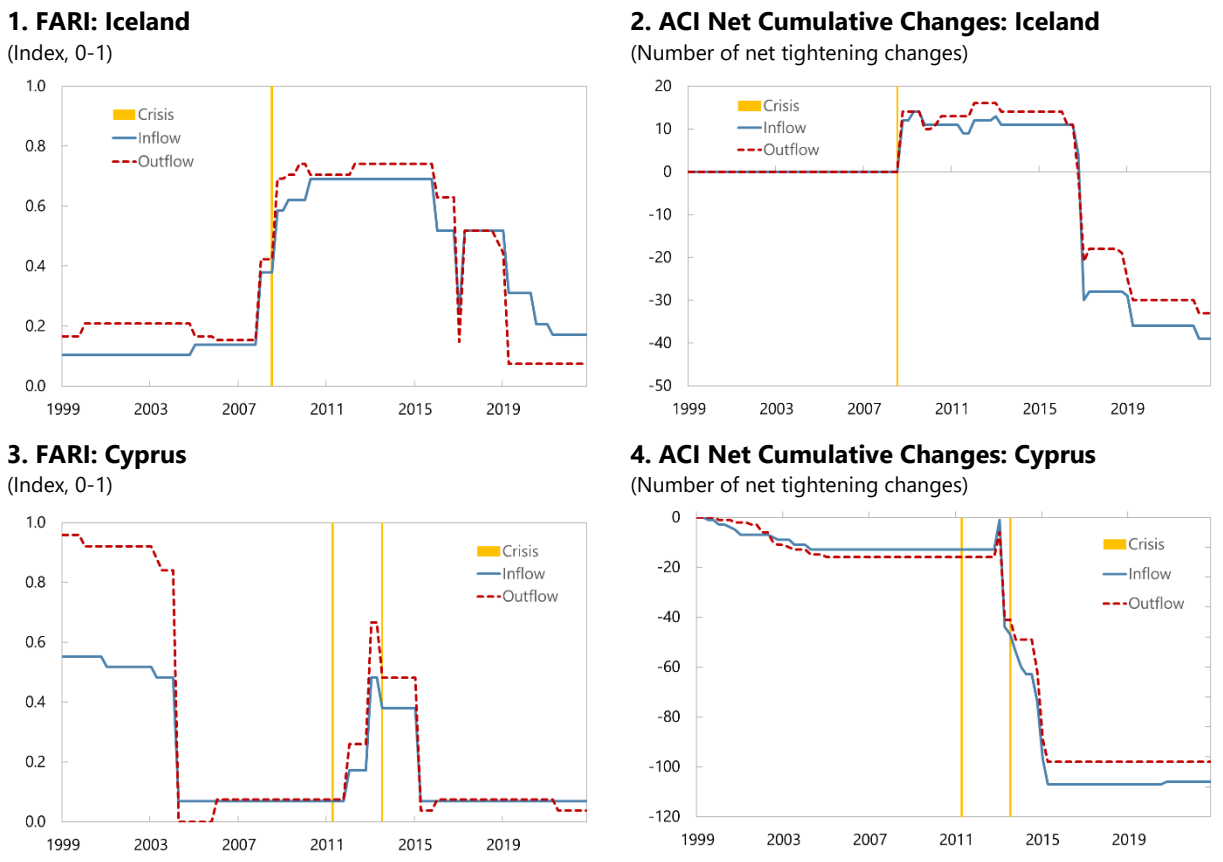
The relatively low number of tightening measures compared to easing measures across countries indicate that countries tend to tighten controls boldly in sweeping measures in particular in crisis situations, but ease (especially outflow controls) only gradually. To show this, we calculate for each country the number of changes from ACI divided by the cumulative change from FARI during the analyzed period. A positive (negative) change in inflow FARI from the previous year is treated as a tightening (easing) change, and annual changes are summed over years to calculate the cumulative tightening (easing) changes. The ratio indicates the number of measures used to move FARI. Figure 9 shows that the median number of measures that were taken to move FARI from being fully closed (FARI = 1) to fully open (FARI = 0) is 14 for inflows and 23 for outflows. In contrast, it takes only 10 inflow or 8 outflow tightening measures to move from fully open to fully closed.[18] This in part explains why change-based indices tend to document greater trends toward liberalization than the existence-based ones, as we saw in Figure 2. Gradualism in outflow liberalization is in line with the conventional policy approach for capital account liberalization. See for example, IMF (2012) that advises countries to liberalize when conditions are met.

Developments in crisis-hit advanced countries are good examples to demonstrate the complementarity and differences between FARI and ACI arising from this gradualism in liberalization. Figure 10 shows cumulative ACI and FARI for Iceland and Cyprus. By the mid-2000s, both countries almost fully liberalized their capital accounts. At the onset of the currency crisis in Iceland and sovereign debt crisis in Cyprus, broad-based capital

[18] The median is used because a few countries implemented numerous liberalization measures, while the FARI declines only marginally due to the persistence of other controls. This results in a high implied number of changes required for these countries to transition from being fully closed to fully open.

controls were introduced in both countries and resulted in a sharp rise of the respective FARI. Both inflow and outflow FARI increased, because not only residents' external investments (i.e. outflows), but the reversal of nonresident investments in the country (i.e. inflows under the BOP concept) became subject to restrictions. With these controls gradually lifted over time, FARI returned to pre-crisis levels in a few years. These developments are captured by the ACI as a small number of tightening measures initially, followed by numerous steps of liberalization, thus the number of easing measures far exceeding that of tightening measures. The number of tightening measures is limited because initial capital controls were extensive, broad-based and implemented upfront at the same time to avoid leakages (e.g., a ban on external portfolio investments which was then liberalized in a number of steps). A simple comparison of the number of easing and tightening measures over this period, however, could give the wrong impression that the countries have arrived at a more liberalized framework after the crisis. The reality, however, is that liberalization was done in a gradual manner. Looking at it closer, the ACI for Iceland indicates additional tightening measures after their introduction, reflecting the fine-tuning of capital controls to prevent circumvention of measures. This tightening is not detectable from FARI, because partial tightening or easing does not affect the existence indicators. While neither FARI nor ACI is suited to measure the intensity of restrictions, cross-referencing the two indices could help gauge it in some cases.

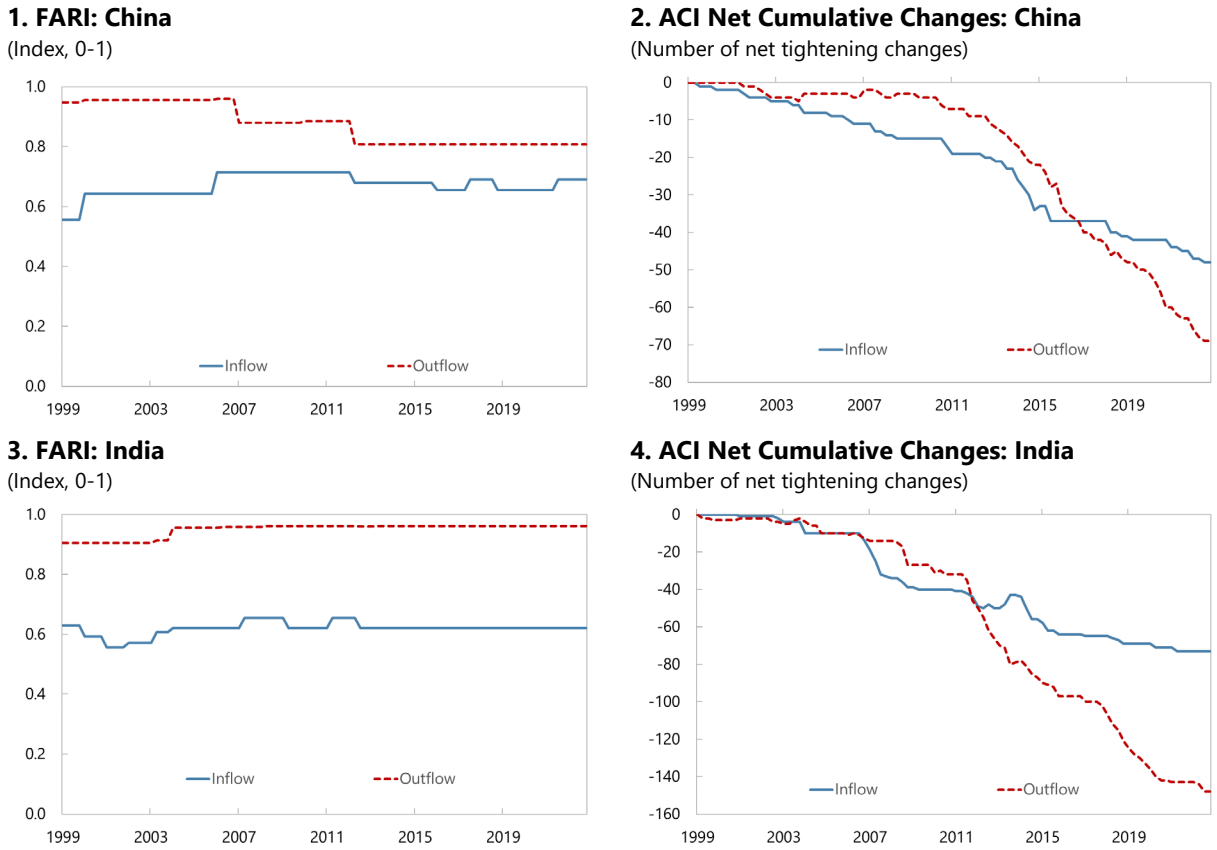
Figure 10. Example of Gradual Liberalization of Crisis Capital Controls



Notes: Panels 1 and 3 display inflow and outflow FARI for Iceland and Cyprus, respectively. Panels 2 and 4 display net tightening measures, i.e. the number of tightening measures minus the number of easing measures, on a cumulative basis since January 1999 for inflow and outflow separately, for Iceland and Cyprus, respectively. Yellow lines indicate crisis dates as identified by Laeven and Valencia (2020), and show the occurrence of a currency crisis in Iceland in September 2008, a banking crisis in Cyprus in June 2011, and a sovereign debt crisis in Cyprus in July 2013.

It is worth noting that FARI and ACI do not always show a consistent trend. Figure 11 presents two country examples – China and India – where ACI shows a number of easing measures, while FARI does not show rapid liberalization. Such a discrepancy typically happens because the existence indicator used to construct FARI does not change until transactions are fully liberalized. We note that among the most frequently used indices the gradual liberalization of China is indicated only by Quinn and Toyoda (2008) which considers the restrictiveness of the measures in effect, while the gradual liberalization in India is registered only by the few indices based on the changes in measures such as the ACI. Looking at specific countries, one can see that in some cases the FARI moves in one direction while the ACI in the opposite direction. The reason for that discrepancy is typically that while the number of easing measures exceeds the tightening ones showing a continuous liberalization, the easing measures may not liberalize the specific transactions fully so that the corresponding existence indicator would change to no from yes, while even one tightening measure introduced on previously uncontrolled transactions can increase the corresponding FARI value. While there is no simple solution to reconcile these discrepancies, referring to both FARI and ACI at the same time can offer complementary information. FARI tends to represent restrictiveness across countries well as strong correlations with the other indices in Table 1 imply, while ACI is better suited to capture the direction of policy changes over time. Our empirical analysis in the following section shows that, despite these imperfections, numerical exercises can find consistent findings from FARI and ACI.

Figure 11. Example of Gradual Liberalization of Capital Accounts



Notes: Panels 1 and 3 display inflow and outflow FARI for China and India, respectively. Panels 2 and 4 display net tightening measures, i.e. the number of tightening measures minus the number of easing measures, on a cumulative basis since January 1999 for inflow and outflow separately, for China and India, respectively.

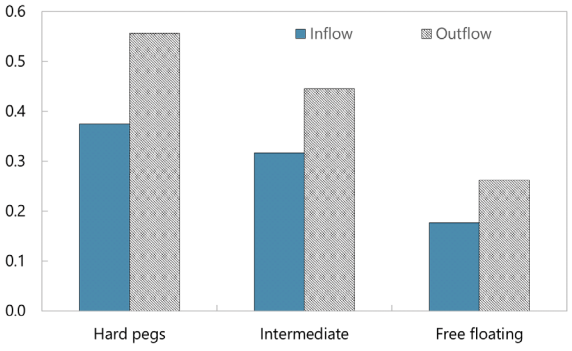
3. Factors related to the use of restrictions

Country characteristics matter for the level of restrictiveness and the frequency of using capital controls. Most obvious factor is the participation in regional or international frameworks that promote capital account liberalization. In particular, OECD members are obligated to liberalize capital transactions and refrain from introducing additional capital controls except for certain transactions. The obligations for EU members are even more wide-ranging, requiring full liberalization within the EU and with third countries. There is also a liberalization accord among ASEAN countries, but it has less enforcement power and hence resulted in slower liberalization. Bilateral investment treaties and often free trade agreements include obligations for the free movement of capital between the parties, constraining them to freely control capital flows when needed in certain circumstances.

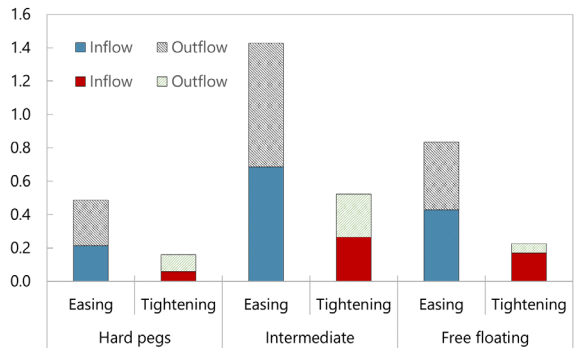
Exchange rate arrangements also matter for the use of capital controls. Figure 12.1 indicates that countries with pegged exchange rate regimes maintain more restrictive capital accounts than others, while countries with independently floating currency have more open capital accounts. Figure 12.2, however, shows that countries with intermediate regimes tend to adjust capital controls more frequently. These patterns are consistent with policy configuration under the impossible trinity of open economies, which suggests that a country cannot achieve all three of the following policy targets simultaneously: monetary policy independence, stability in the exchange rate, and free capital movement. Hard pegged countries prioritize stability in the exchange rate, hence generally give up open capital accounts; and because capital movements are generally more restricted, they have less need to adjust controls along with domestic conditions. On the other hand, free floaters allow freer flows of capital by maintaining less restrictive capital accounts and let exchange rates adjust, which also suggests a limited need to use capital controls. Those in between are the ones that would need more tools to ensure stability by using FX interventions or with active adjustments in capital controls, because they pursue the middle ground of three targets.

Figure 12. Exchange Rate Arrangement and Capital Controls

1. Average FARI by Exchange Rate Arrangement
(Index, 0-1)



2. Average Number of Changes by Exchange Rate Arrangement (Index, 0-1)



Notes: Panel 1 shows simple average of FARI across countries by exchange rate arrangement. Panel 2 shows average annual number of changes across countries by exchange rate arrangement based on ACI. Classification of exchange rate arrangement follows IMF, and definition of hard peg and free floating is provided in Annex I.

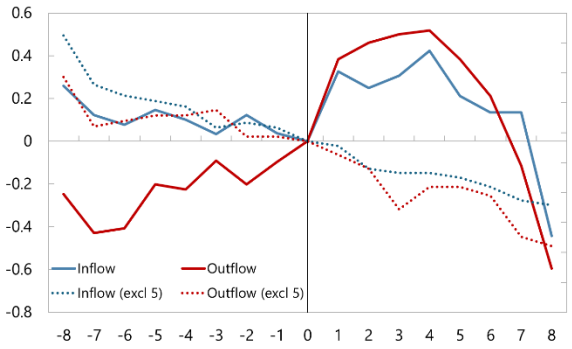
Another common reason for using capital controls is the occurrence of a currency or sovereign debt crisis. Figure 13 shows the average number of changes implemented by crisis-hit countries in a cumulative manner. In countries hit by a currency crisis in Figure 13.1, outflow controls are gradually tightened even before the crisis starts. At the onset of the crisis with a sharp currency depreciation, countries introduce both inflow and

outflow controls and then start to ease after about 4 quarters (see Annex III for definition of inflow and outflow and the explanation before on inflow tightening in crisis). In the case of a sovereign debt crisis in Figure 13.2, countries tighten inflow and outflow controls about 2 quarters before the crisis, and liberalization follows afterwards. Implementation of capital controls predates the crisis in part because the crisis identification methodology utilizes the timing of both sovereign default and restructuring, which can happen after major market reactions.[19]

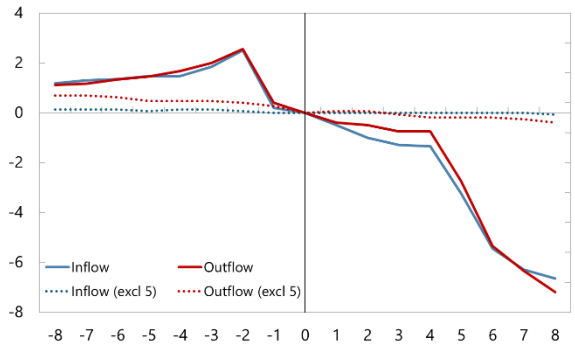
However, not all crisis-hit countries implemented capital controls. In particular, if we exclude countries that experienced a crisis and reported many changes in Figure 8 (that are Argentina, Cyprus, Ukraine, Iceland and Greece), Figure 13 does not indicate a meaningful rise in the average number of changes around the crisis period. While documenting other policy reactions in these countries is beyond the scope of this paper, we note that with the aim of preventing a sharp depreciation of the exchange rate, some countries limited the availability of foreign exchange, not only for capital account transactions but also for current account transactions, leading to a rise in parallel market premiums. While such an action clearly restricts capital transactions, by making it more expensive (in fact acting like a tax) it is not registered as a formal capital control. Instead, it may be considered as an exchange restriction or multiple currency practice if it meets certain criteria as discussed in IMF (2022b).[20]

Figure 13. ACI around Crises

1. Cumulative ACI around currency crisis
(Crisis date = 0, quarterly)



2. Cumulative ACI around sovereign debt crisis
(Crisis date = 0, quarterly)



Notes: Charts show average net number of changes (tightening changes minus easing changes) by crisis-hit countries in 8 quarters before and after a crisis, normalized at 0 at the quarter of the crisis. Crisis dates are based on Laeven and Valencia (2020) and cover 2000-2017. Dashed lines show the corresponding numbers excluding changes by five countries (Argentina, Cyprus, Greece, Iceland, and Ukraine) that report large number of changes around crises. Cyprus and Greece experienced sovereign debt crisies and Iceland experienced a currency crisis during the analyzed period, but not both types of crises.

[19] A corresponding chart for banking crisis is not reported, as banking crisis does not necessarily cause foreign exchange market pressures unless it happens along with a currency or sovereign debt crisis. The chart in fact does not indicate introduction of capital controls around the time of banking crisis. For example, both Cyprus and Greece are identified to have a banking crisis in 2008 together with many other countries in Europe, but the introduction of controls took place only in the context of their sovereign debt crisis in 2012 in Greece and in 2013 in Cyprus. In Iceland, capital controls were introduced during its dual (currency and banking) crisis in 2008. This observation differs from the evidence in Chang and others (2024) on the use of outflow controls around banking and financial crises, possibly reflecting the difference in the country coverage.

[20] Under the IMF's policy on multiple currency practices, IMF members are required not to engage in multiple currency practices, although the Executive Board may approve such practices under certain conditions.

IV. Empirical Analysis of Motivations for Capital Account Restrictions

In this section, we empirically explore why countries maintain and adjust capital controls. Since the FARI and ACI offer complementary information on capital control policies, we mainly use FARI to analyze longer term determinants of capital account restrictiveness at annual frequency and use ACI to analyze higher-frequency adjustments to capital account restrictions to address macroeconomic or financial stability concerns. We, however, do not assess whether capital control policies have achieved their objectives.

1. Long term determinants

We first estimate the following equation relating the level of capital account restrictiveness to country characteristics with a panel dataset:

$$FARI_{it} = \alpha + \beta X_{i,t-1} + \vartheta_i + \mu_t + \varepsilon_{it}$$

where X_{it} denotes a set of variables on country characteristics in country *i* in year *t*; ϑ_i and μ_t are country- and time-fixed effects, respectively; and ε_{it} is an error term. The regressions are applied to inflows and outflows separately for ease of interpretation and also run separately by income group. Since FARI is restricted to the range between 0 and 1 by construction, the equation is estimated as a generalized linear model (GLM). All regressions control for country fixed effects, and our benchmark regressions additionally include year fixed effects. We also experiment with a linear time trend, in which case year fixed effects are excluded.

Country characteristics include those related to economic and financial development, such as income level measured by log of GDP per capita, financial development measured by a combination of financial depth, efficiency, and ease of access (from the IMF Financial Development Indicator database), and total external liabilities (or assets) in terms of GDP as a measure of de facto openness of inflows (or outflows). In addition, variables related to exchange rates and external pressures are used, including dummies indicating a peg or free floating exchange rate regime, existence of parallel market exchange rate premium, overvaluation (measured by the real effective exchange rates), and occurrence of currency or sovereign debt crisis, and level of foreign exchange reserves (measured by their import coverage). We also include a dummy variable indicating membership in the OECD or the EU. See Annex I for variable description and sources.

To ensure adequate representation, we exclude observations if FARI is constructed from only a small number of underlying indicators. Specifically, for each year in the sample, we require the availability of at least two binary indicators per country for each of the three categories of capital flows (FDI, portfolio, other investment), by their direction (inflow and outflow), respectively. Then, we require at least 5 annual FARI per country. As a result, data is available for 183 countries, of which 157 have data for the entire period from 1999 through 2022 and 26 more have more than 10 years of data. The results are qualitatively robust if we instead include all available FARI data. The availability of explanatory variables further restricts the country coverage for the regressions to 169 countries.

The regressions confirm that countries liberalize their capital accounts as they develop. Tables 2 and 3 report the results for inflows and outflows, respectively. Coefficients on GDP per capita and financial developments

are negative both for inflows and outflows, indicating less restrictive inflow and outflow controls as income rises. The elasticity of liberalization is higher for outflows and among advanced economies, which likely reflects rapid liberalization by European countries, especially of outflows, as presented in Figures 7.1-7.2. However, for developing economies we do not find these negative relationships between economic and financial developments and restrictiveness as statistically significant.

De facto financial account openness has mixed implications across different development groups. Table 2 indicates that more inflows are related to tighter restrictiveness, especially among emerging economies. This is consistent with the assumption that countries may slow down or even reverse previous inflow easing after experiencing rapid inflows. An analogous relationship appears to hold on the outflow side for emerging economies, as reported in Table 3, where larger de facto outflow openness in the previous year is associated with higher *de jure* restrictiveness for emerging economies. However, the coefficient is weakly negative if all countries are pooled, which can be driven by continued and successful outflow control liberalization in developing and advanced economies.

Appreciation of the currency is weakly associated with more restrictive inflow and outflow controls in some country groups. The one on outflow restrictions in Table 3 is harder to explain, but it can be driven by currency appreciation that makes the export of capital cheaper, incentivizing capital outflows which may prompt tightening outflow restrictions to prevent further capital outflows. If an appreciated exchange rate is sustained through policy interventions rather than market forces, this by itself can trigger capital flight leading to outflow controls. The result may also capture a relationship between rebounding exchange rate and tightening of crisis controls to close loopholes in advanced economies. Tighter inflow controls following currency appreciation, observed among advanced economies in Table 2, could be an indication of capital control policy in response to capital inflows that exert pressure on the currency.

Exchange rate flexibility is found to matter to capital account restrictiveness. Table 3 indicates that having a pegged exchange rate arrangement tends to lead countries to maintain more restrictive outflow controls, while it is not related to restrictiveness on the inflow side in Table 2. The absence of evidence for inflow controls, despite higher FARI on average for pegged regimes as documented in Figure 12.1 reflects the fact that many countries maintained the pegged regime throughout our sample period, so their impacts are captured by country fixed effects. A free-floating framework is associated with lower restrictiveness for both inflows and outflows. These relationships are consistent with the understanding that, when faced with external shocks, countries that allow exchange rates to adjust do not need tight capital controls.

In countries facing external financing needs, outflow controls tend to be more restrictive, as implied by the negative coefficient on FX reserve coverage in Table 3. This negative relationship is found for developing and emerging economies, while lower FX reserve coverage is associated with lower outflow restrictiveness among advanced economies. This can potentially reflect the lower importance of FX reserves among advanced economies that tend to maintain more flexible exchange rates. Table 2 suggests a similar relationship for inflows for advanced economies – that is, lower reserves imply lower inflow restrictiveness, which can be explained by a co-movement in transition to more flexible exchange rate and capital account liberalization. For developing and emerging economies, the relationship is again the opposite: higher FX reserves are associated with lower inflow restrictiveness, suggesting inflow liberalization when countries maintain ample FX reserves. When all countries are pooled, inflow restrictiveness and FX reserves do not have a statistically significant relationship, reflecting country heterogeneity.

Two variables related to balance of payment difficulties are also associated with higher financial restrictiveness. An episode of currency or debt crisis in the preceding year is related to higher inflow and outflow restrictiveness among advanced economies. These are consistent with the extensive use of capital controls in crisis-hit advanced economies in Europe, including restrictions on the reversal of capital inflows. While the crisis dummy does not find a statistically significant relationship among emerging and developing economies,[21] the existence of parallel market premium is associated with lower capital account restrictiveness (both inflow and outflow) especially among developing economies. A possible reason for this relationship can be that some of these countries facing balance of payment difficulties resort to current account restrictions (such as FX rationing) instead of formal capital controls.

Other variables included to control for institutional quality and restraints for the use of capital controls have expected signs. Members of the EU and the OECD have less restrictive capital accounts as expected, given their use of capital controls is restricted by the membership agreements and because as their membership indicates, they have likely reached a level of economic and financial development which allows the safe removal of capital controls. The coefficient is not identifiable among advanced or developing economies because country fixed effects account for them unless there is a change in their membership during the sample period.

Finally, we also experimented with replacing year dummies with a time trend (see results for even numbered columns in Table 1 and 2). In aggregate, the time trend has a negative sign on inflow restrictiveness among developing economies, indicating their overall liberalization trend on top of what is indicated by the rise in their income or developmental levels. It has a positive sign on inflows among emerging and advanced countries, suggesting a reversal of liberalization among these groups in recent periods. Likewise, a downward trend exists for outflow restrictiveness among developing economies, while the trend is positive for emerging economies.

Overall, the regressions using FARI document that a confluence of reasons exist in countries' use of capital controls. A trend towards liberalization, measured by a rise in income level, financial development, or a time trend, is evident across different developmental groups, while there are some reversals. Countries tend to maintain a more restrictive system with an inflexible exchange rate regime, lower FX reserves, or in a currency crisis. There is also weak evidence that higher inflows or appreciation pressures are linked with inflow restrictiveness. Since capital flow cycles and business cycles can be better captured by higher frequency data, we focus on the use of capital controls in response to cyclical factors in the following section using ACI data.

[21] This can in part reflect the fact that our crisis dummy does not cover crisis episodes after 2017, while some emerging and developing economies experienced balance of payment difficulties.

Table 2. Inflow FARI regression results

	All countries		Developing		Emerging		Advanced	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GDP per capita (t-1)	**-0.162*** **	**-0.073** **	-0.025	0.063	-0.074	-0.052	**-0.441*** **	**-0.264** **
	(-3.569)	(-2.026)	(-0.302)	(0.856)	(-1.257)	(-1.138)	(-2.957)	(-2.161)
Financial development (t-1)	**-0.605** **	**-0.521** **	-0.919	-1.101	**-1.141*** **	**-1.110*** **	-0.768	-0.279
	(-2.414)	(-2.159)	(-0.982)	(-1.161)	(-3.747)	(-3.832)	(-1.428)	(-0.552)
External liabilities (t-1)	0.003	**0.004***	0.030	0.018	**0.004** **	**0.005*** **	-0.002	-0.000
	(1.459)	(1.825)	(0.721)	(0.441)	(2.505)	(3.097)	(-0.564)	(-0.120)
REER appreciation (t-1)	0.000	0.000	0.002	0.001	-0.001	-0.001	**0.012***	0.007
	(0.340)	(0.273)	(0.485)	(0.463)	(-0.546)	(-0.589)	(1.732)	(0.986)
Peg dummy (t-1)	-0.023	-0.027	0.063	0.064	-0.001	0.005	-0.032	-0.111
	(-0.532)	(-0.614)	(0.840)	(0.820)	(-0.012)	(0.093)	(-0.183)	(-0.568)
Free floating dummy (t-1)	**-0.180*** **	**-0.194*** **	-0.200	**-0.214***	**-0.247*** **	**-0.248*** **	0.061	-0.048
	(-3.588)	(-3.823)	(-1.603)	(-1.709)	(-3.975)	(-3.925)	(0.587)	(-0.419)
FX reserve coverage (t-1)	-0.015	-0.021	**-0.042***	**-0.049** **	**-0.066***	**-0.059***	**0.215*** **	**0.158*** **
	(-0.797)	(-1.109)	(-1.686)	(-1.983)	(-1.878)	(-1.721)	(4.575)	(3.499)
Crisis dummy (t-1)	0.022	0.038	-0.088	-0.071	0.010	0.007	**0.797** **	**0.926** **
	(0.261)	(0.465)	(-0.647)	(-0.512)	(0.106)	(0.071)	(2.032)	(2.501)
Parallel market dummy (t-1)	**-0.150** **	**-0.161*** **	**-0.327** **	**-0.357*** **	-0.063	-0.058		
	(-2.483)	(-2.660)	(-2.534)	(-2.768)	(-0.994)	(-0.906)		
OECD or EU dummy (t-1)	**-0.342*** **	**-0.343*** **			**-0.598*** **	**-0.598*** **		
	(-3.403)	(-3.423)			(-5.249)	(-5.199)		
Time trend		**-0.006*** **		**-0.032*** **		**0.007** **		**0.012** **
		(-2.679)		(-6.628)		(2.367)		(2.005)
Constant	**1.036** **	0.083	**-15.877*** **	**-16.334*** **	0.810	0.576	**3.593** **	1.336
	(2.100)	(0.213)	(-28.385)	(-32.177)	(1.595)	(1.462)	(2.309)	(1.116)
Year fixed effects	yes	no	yes	no	yes	no	yes	no
Country fixed effects	yes	yes	yes	yes	yes	yes	yes	yes
Number of Countries	169	169	57	57	77	77	35	35
Observations	3,559	3,559	1,120	1,120	1,640	1,640	799	799

Notes: Estimated with unbalanced panel data for 169 countries, 2000-2022, annual. All explanatory variables are lagged by one year. Z-scores reported in parentheses are corrected for heteroscedasticity and autocorrelations. *** p<0.01, ** p<0.05, * p<0.1.

Table 3. Outflow FARI regression results

	All countries		Developing		Emerging		Advanced	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GDP per capita (t-1)	**-0.368*** **	**-0.306*** **	0.011	-0.005	**-0.529*** **	**-0.411*** **	**-0.920*** **	**-0.661*** **
	(-6.100)	(-6.256)	(0.093)	(-0.048)	(-7.376)	(-7.213)	(-3.514)	(-3.430)
Financial development (t-1)	**-1.267*** **	**-1.256*** **	0.943	0.686	**-1.800*** **	**-1.550*** **	**-2.274*** **	**-1.698*** **
	(-3.658)	(-3.718)	(0.610)	(0.419)	(-4.059)	(-3.681)	(-3.149)	(-2.594)
External assets (t-1)	**-0.003***	**-0.003***	-0.027	-0.030	**0.024*** **	**0.025*** **	-0.002	-0.002
	(-1.730)	(-1.652)	(-0.425)	(-0.490)	(3.914)	(4.153)	(-0.917)	(-0.824)
REER appreciation (t-1)	**0.003** **	**0.003** **	0.000	0.000	**0.003** **	**0.003***	**0.018** **	0.012
	(2.098)	(2.011)	(0.053)	(0.103)	(2.048)	(1.831)	(2.150)	(1.382)
Peg dummy (t-1)	**0.239*** **	**0.200*** **	**0.240** **	**0.252** **	**0.258*** **	**0.197*** **	0.568	0.393
	(3.707)	(3.153)	(2.062)	(2.194)	(3.728)	(2.957)	(1.620)	(1.032)
Free floating dummy (t-1)	**-0.127***	**-0.153** **	**-0.421** **	**-0.430** **	0.047	-0.008	0.107	-0.003
	(-1.887)	(-2.312)	(-2.426)	(-2.509)	(0.604)	(-0.098)	(0.746)	(-0.019)
FX reserve coverage (t-1)	**-0.054** **	**-0.062** **	**-0.103** **	**-0.098** **	**-0.216*** **	**-0.228*** **	**0.142** **	**0.105***
	(-1.991)	(-2.311)	(-2.186)	(-2.111)	(-5.262)	(-5.585)	(2.263)	(1.741)
Crisis dummy (t-1)	0.049	0.080	-0.021	-0.020	0.011	0.041	**0.874** **	**1.015** **
	(0.534)	(0.910)	(-0.128)	(-0.127)	(0.130)	(0.537)	(2.081)	(2.477)
Parallel market dummy (t-1)	-0.077	-0.083	**-0.480*** **	**-0.473*** **	0.087	0.076		
	(-1.056)	(-1.152)	(-3.366)	(-3.306)	(1.328)	(1.135)		
OECD or EU dummy (t-1)	**-0.969*** **	**-0.969*** **			**-0.769*** **	**-0.755*** **		
	(-5.390)	(-5.287)			(-4.205)	(-4.098)		
Time trend		**0.008** **		**-0.019** **		**0.030*** **		-0.007
		(2.507)		(-2.437)		(7.363)		(-0.877)
Constant	**5.011*** **	**4.251*** **	**-2.083*** **	**-1.912*** **	**6.507*** **	**5.226*** **	**10.904*** **	**7.684*** **
	(7.340)	(7.611)	(-2.663)	(-2.689)	(9.878)	(9.587)	(4.039)	(3.975)
Year fixed effects	yes	no	yes	no	yes	no	yes	no
Country fixed effects	yes	yes	yes	yes	yes	yes	yes	yes
Number of Countries	169	169	57	57	77	77	35	35
Observations	3,559	3,559	1,120	1,120	1,640	1,640	799	799

Notes: Estimated with unbalanced panel data for 169 countries, 2000-2022, annual. All explanatory variables are lagged by one year. Z-scores reported in parentheses are corrected for heteroscedasticity and autocorrelations. *** p<0.01, ** p<0.05, * p<0.1.

2. Business and financial cycle determinants

We examine cyclical factors that help predict tightening and liberalization of capital controls. Considering differences in typical motivations for policy changes, we study four types of regulatory changes separately, namely tightening controls on inflows and outflows, respectively, and liberalization measures on inflows and outflows, respectively. We employ a probit model where the dependent variable is 1 for a given country-quarter if there is at least one regulatory change taking effect in that quarter and 0 otherwise. We do not differentiate the number of measures taken by a country in a given quarter, because of the large heterogeneity in the number of measures taken across countries, as documented in Figure 8.2. Specifically, the following equation is applied:

$$P(any\ change_{it} = 1|X) = \phi(\alpha + \beta X_{i,t-1} + \vartheta_i)$$

where $\phi(\cdot)$ is the standard normal cumulative distribution function, $X_{i,\,t-1}$ denotes a set of variables on country characteristics in country *i* in quarter *t*, and ϑ_i is a country fixed effect.

Main variables of interest are those related to the typical motivations for the introduction of capital controls. These include excessive capital flows, overshooting exchange rates, overheating business cycle and excessive credit growth fueling financial stability concerns in the case of inflow controls. With these in mind, we experiment with three different measures of capital flows – net capital inflows, gross capital inflows, and a sustained period of inflows (i.e. capital surge) following Forbes and Warnock (2012). Since capital flows can be volatile at quarterly frequency, we use 4-quarter moving averages of capital flows relative to GDP. Real exchange rate appreciation is measured by a change in real effective exchange rate over the previous year. Output gaps and credit gaps are calculated by applying one-sided HP filter to real GDP and credit-to-GDP ratio, respectively. Explanatory variables for outflow controls are analogously defined. Outflow controls are typically introduced in the context of a balance of payment crisis, which motivates dummy variables such as those that indicate a debt or currency crisis and presence of parallel market exchange rates, as well as low FX reserve coverage of imports. Relevant subsets of these variables are included for each of the 4 types of changes.[22]

Due to the inclusion of country fixed effects, countries that do not make any relevant changes during the sample period are excluded from the analysis for collinearity. This constraint results in varying country coverage for each policy type. In particular, the data availability of explanatory variables at the quarterly frequency leaves 98 countries in our dataset. This country set is biased to emerging and advanced economies, because the availability of quarterly variables (such as GDP and credit volume) for developing economies tends to be limited. The requirement of a change during the sample period further reduces the country coverage to 67 for inflow tightening changes, 42 for outflow tightening changes, 67 countries for inflow easing changes, and 67 for outflow easing changes. We show subsample results by developmental group, while we report the results only if at least five countries remain in a group. The analysis also includes a dummy variable for COVID period (4 quarters starting from 2020Q2). The sample period covers 2000Q1 through 2022Q4.

[22] We excluded dummy variables related to exchange rate arrangement (such as peg or free floating), because they do not change at quarterly frequency and apply to only a limited set of countries. As a result, the variables often overlap with country fixed effects and the estimation is imprecise.

For inflow tightening changes, the results in Table 4 suggest that typical motivations including taming cycles and exchange rate pressures play a role.[23] When all countries are pooled, key macroeconomic variables associated with favorable business or financial cycles, including positive output and credit gaps and exchange rate appreciation, are found to lead to inflow tightening, while no statistically significant relationship is identified with the metrics of capital inflows. For emerging economies, by contrast, capital inflows – gross and net – are significant drivers of inflow tightening, whereas the other macroeconomic variables do not show statistically significant effects. This pattern may reflect difficulties in disentangling the role of these variables individually given their comovements with economic cycles. In advanced economies, some cyclical indicators, such as a positive output gap and high FX reserves, are associated with inflow tightening, but the regressions also find relationships that are opposite to standard predictions: tightening is more likely if an advanced economy maintains a high level of capital account restrictiveness and is a member of OECD or EU. These results appear to capture the experiences of European countries (in particular Cyprus and Greece) who introduced extensive capital controls after they had become EU members when experiencing crisis and where such crisis capital controls were adjusted following their introduction to address loopholes.[24] The positive coefficient on the COVID dummy can similarly reflect these crisis capital controls, while it also captures the introduction of FDI screening framework that was implemented in phases in 2020 by the EU members.[25]

Indicators associated with housing market booms also appear to matter for inflow tightening. Table 5 reports regression results that include housing market variables such as real house price growth and house price-to-income ratio.[26] Because house price data are limited for emerging economies, the country coverage narrows accordingly. Although these variables do not play a statistically significant role when all countries are included, inflow tightening is more likely in emerging economies experiencing faster house price growth and in advanced economies with higher price-to-income ratios. These findings align with increased use of capital controls targeting real estate transactions, especially among advanced economies, as discussed earlier (see Figures 5.1 and 6.5), and reinforce evidence that capital controls are employed for financial stability purposes.

These results are in line with the literature documenting cyclical use of capital controls, with notable heterogeneity across countries. Existing studies using a change-based measure of capital controls have similarly presented countercyclical use of inflow controls, for example, Binici and Das (2021) and Pasricha (2022), while the exact objectives documented by these studies vary. Relative to these studies, our analysis expands country coverage and offers evidence that, provided there is a policy change, nearly all of the concerns matter including macroeconomic stability (overheating), financial stability (excessive credit, housing market boom), and exchange rate appreciation. Heterogeneity of the results across subgroups (and across

[23] From the analysis of inflow tightening changes, we exclude observations that coincide with a currency or sovereign debt crisis, as well as those for the following two quarters. During a crisis, authorities sometimes restrict the reversal of nonresident investments in the country (for example, nonresidents deposit withdrawals). Because these measures limit transactions affecting external liabilities, in line with the BOP, they are coded as inflow tightening actions in the ACI. However, they are expected to have effects on inflows opposite to those of typical inflow restrictions and are implemented under very different economic conditions.

[24] The regressions do not include crisis dummy because it is redundant after excluding observations following the crises (see previous footnote). However, excluding such observations does not necessarily eliminate crisis related inflow tightening measures, for example, when restrictions on the reversal of inflows are adjusted after the initial imposition of controls. Also, as previously discussed in Figure 13.2, some crisis-related controls predate a sovereign debt crisis due to the crisis identification methodology.

[25] In fact, if a separate dummy for 2020 for EU members is included in a subsample analysis only with European countries, COVID dummy is not statistically significant.

[26] For brevity, Table 5 reports the results with gross capital inflows only. The qualitative results are the same if net capital inflows or inflow surges are used.

countries, which are not included in the paper) may explain why such variations exist in the literature. At the same time, the evidence for countercyclical use emerges only from countries that actually implemented some inflow tightening measures. About a third of the countries in the sample with available macroeconomic data did not implement inflow tightening measures, and are omitted from the regressions. For these countries, it is fair to conjecture that their inflow control policy is not countercyclical, as documented, for example, by Fernandez and others (2015) and Bhargava and others (2023).

Table 4. Inflow tightening ACI regression results

	All countries			Emerging			Advanced		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Net capital inflows (t-1)	0.003			0.022*			-0.009		
	(0.274)			(1.751)			(-1.286)		
Gross capital inflows (t-1)		-0.001			0.013***			-0.002**	
		(-1.498)			(5.694)			(-2.110)	
Inflow surge (t-1)			0.116			0.042			0.222
			(0.923)			(0.225)			(1.149)
Output gap (t-1)	0.005*	0.005*	0.005*	0.002	0.002	0.002	0.064***	0.065***	0.060**
	(1.855)	(1.845)	(1.851)	(0.792)	(0.890)	(0.785)	(2.780)	(2.627)	(2.435)
Credit gap (t-1)	0.011**	0.012***	0.011**	0.011	0.009	0.010	0.008	0.009	0.008
	(2.553)	(2.584)	(2.560)	(1.003)	(0.888)	(0.979)	(1.216)	(1.245)	(1.256)
REER appreciation (t-1)	0.009**	0.009**	0.009*	0.002	0.003	0.002	0.019	0.018	0.017
	(2.068)	(2.117)	(1.936)	(0.526)	(0.639)	(0.579)	(1.596)	(1.521)	(1.428)
FX reserve coverage (t-1)	0.099	0.102	0.098	-0.059	-0.028	-0.063	0.160**	0.166**	0.156**
	(1.473)	(1.545)	(1.434)	(-0.284)	(-0.142)	(-0.317)	(2.176)	(2.308)	(2.074)
Inflow FARI (t-1)	0.320	0.240	0.344	-0.131	-0.059	-0.062	1.142*	1.057	1.418**
	(0.529)	(0.399)	(0.548)	(-0.231)	(-0.097)	(-0.101)	(1.940)	(1.639)	(2.074)
COVID dummy (t-1)	0.979***	0.961***	0.973***	0.386*	0.288	0.339*	1.774***	1.751***	1.761***
	(7.051)	(6.975)	(7.094)	(1.957)	(1.441)	(1.674)	(7.786)	(7.452)	(7.571)
OECD/EU dummy (t-1)	-0.007	-0.005	-0.016	-0.147	-0.120	-0.146	4.951***	5.064***	5.132***
	(-0.021)	(-0.015)	(-0.048)	(-0.372)	(-0.324)	(-0.402)	(17.431)	(21.735)	(20.165)
Constant	-2.274***	-2.239***	-2.267***	-1.611***	-1.676***	-1.534***	-7.392***	-7.484***	-7.654***
	(-6.205)	(-6.212)	(-6.217)	(-3.912)	(-4.111)	(-3.894)	(-39.987)	(-53.386)	(-50.875)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of countries	67	67	67	33	33	33	33	33	33
Observations	4,847	4,847	4,847	2,226	2,226	2,226	2,535	2,535	2,535

Notes: Probit model, estimated with unbalanced panel data for 67 countries, 2000Q1-2022Q4. All explanatory variables are lagged by one quarter. Net and gross capital flows are 4 quarter moving averages. REER appreciation is measured by change in REER over the previous four quarters. Observations from crisis quarters and the next two quarters are excluded. Z-scores reported in parentheses are corrected for heteroscedasticity and autocorrelations. *** p<0.01, ** p<0.05, * p<0.1.

Table 5. Inflow tightening ACI regression results with real estate indicators

	All countries			Emerging			Advanced		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Gross capital inflows (t-1)	-0.001	-0.002	-0.001	0.013***	0.016***	0.015***	-0.002**	-0.002**	-0.003**
	(-1.498)	(-1.224)	(-1.238)	(5.694)	(5.033)	(4.798)	(-2.110)	(-2.001)	(-2.138)
Output gap (t-1)	0.005*	0.051***	0.062***	0.002	0.046*	0.058**	0.065***	0.066***	0.076***
	(1.845)	(2.954)	(3.834)	(0.890)	(1.690)	(2.033)	(2.627)	(2.749)	(2.746)
Credit gap (t-1)	0.012***	0.012**	0.012**	0.009	0.018	0.015	0.009	0.009	0.009
	(2.584)	(2.266)	(2.350)	(0.888)	(1.446)	(1.219)	(1.245)	(1.231)	(1.285)
REER appreciation (t-1)	0.009**	0.018***	0.018***	0.003	0.014*	0.013*	0.018	0.019	0.017
	(2.117)	(2.870)	(3.000)	(0.639)	(1.929)	(1.925)	(1.521)	(1.469)	(1.374)
FX reserve coverage (t-1)	0.102	0.113	0.122	-0.028	0.061	-0.170	0.166**	0.200**	0.202**
	(1.545)	(1.220)	(1.343)	(-0.142)	(0.155)	(-0.432)	(2.308)	(2.148)	(2.117)
Inflow FARI (t-1)	0.240	1.053	0.947	-0.059	0.719	1.138	1.057	0.991	1.180
	(0.399)	(1.613)	(1.392)	(-0.097)	(0.505)	(0.770)	(1.639)	(1.572)	(1.440)
COVID dummy (t-1)	0.961***	1.348***	1.387***	0.288	0.674**	0.754***	1.751***	1.753***	1.723***
	(6.975)	(7.555)	(8.118)	(1.441)	(2.480)	(2.935)	(7.452)	(7.611)	(7.103)
OECD/EU dummy (t-1)	-0.005	-0.188	-0.177	-0.120	-0.299	-0.277	5.064***	4.991***	4.491***
	(-0.015)	(-0.496)	(-0.471)	(-0.324)	(-0.562)	(-0.621)	(21.735)	(15.474)	(11.943)
Real house price growth (t-1)		1.541			3.303*			-0.435	
		(1.379)			(1.932)			(-0.401)	
House price-to-income ratio (t-1)			0.003			-0.001			0.010*
			(0.850)			(-0.399)			(1.719)
Constant	-2.239***	-2.297***	-2.489***	-1.676***	-1.880**	-1.582**	-7.484***	-7.334***	-7.914***
	(-6.212)	(-5.201)	(-4.784)	(-4.111)	(-2.298)	(-2.070)	(-53.386)	(-42.404)	(-15.529)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of countries	67	53	53	33	20	20	33	33	33
Observations	4,847	3,651	3,712	2,226	1,215	1,251	2,535	2,436	2,461

Notes: Probit model, estimated with unbalanced panel data, 2000Q1-2022Q4. All explanatory variables are lagged by one quarter. Gross capital flows are 4 quarter moving averages. REER appreciation is measured by change in REER over the previous four quarters. Real house price growth is measured by its change over the previous four quarters. Observations from crisis quarters and the next two quarters are excluded. Z-scores reported in parentheses are corrected for heteroscedasticity and autocorrelations. *** p<0.01, ** p<0.05, * p<0.1.

Turning to outflow tightening changes, the regressions confirm that variables characterizing economic and balance of payments crisis are motivating the policy change. Table 6 indicates outflow tightening changes are more likely when a country has a negative output gap, parallel market exchange rate exists, and debt or currency crisis occurred in the previous quarter. Capital outflows or flights are not associated with higher likelihood of outflow tightening. In a regional subsample (not included in the paper for brevity), exchange rate depreciation is linked to outflow tightening changes in Europe.

Table 6. Outflow tightening ACI regression results

	All countries			Emerging			Advanced		
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Net capital flows (t-1)	0.001			0.004			-0.002		
	(0.240)			(0.323)			(-0.401)		
Gross capital outflows (t-1)		0.001			-0.002			0.001	
		(0.376)			(-0.374)			(0.477)	
Capital flight (t-1)			-0.082			-0.107			0.027
			(-0.425)			(-0.424)			(0.072)
Output gap (t-1)	-0.021*	-0.022*	-0.021*	-0.027*	-0.027*	-0.027*	0.023	0.024	0.024
	(-1.679)	(-1.691)	(-1.678)	(-1.850)	(-1.866)	(-1.853)	(0.494)	(0.492)	(0.501)
Credit gap (t-1)	-0.003	-0.003	-0.003	-0.016	-0.017	-0.016	0.001	0.002	0.002
	(-0.983)	(-1.504)	(-1.445)	(-1.136)	(-1.145)	(-1.001)	(0.505)	(0.893)	(0.832)
REER appreciation (t-1)	-0.004	-0.005	-0.004	-0.005	-0.005	-0.005	-0.018	-0.018	-0.018
	(-0.856)	(-0.877)	(-0.860)	(-0.867)	(-0.849)	(-0.855)	(-1.236)	(-1.346)	(-1.324)
FX reserve coverage (t-1)	0.019	0.022	0.016	0.043	0.048	0.044	0.004	0.004	0.004
	(0.155)	(0.185)	(0.140)	(0.140)	(0.155)	(0.143)	(0.026)	(0.025)	(0.026)
Parallel market dummy (t-1)	0.326*	0.323*	0.319*	0.349**	0.341**	0.337**			
	(1.884)	(1.851)	(1.811)	(2.148)	(2.165)	(2.101)			
Outflow FARI (t-1)	0.402	0.424	0.388	0.207	0.205	0.181	0.762***	0.837**	0.785**
	(1.117)	(1.185)	(1.120)	(0.309)	(0.307)	(0.281)	(2.907)	(2.565)	(2.544)
Crisis dummy (t-1)	0.233	0.240	0.235	-0.069	-0.070	-0.067	1.436**	1.443**	1.409*
	(0.892)	(0.932)	(0.906)	(-0.346)	(-0.353)	(-0.338)	(2.035)	(2.300)	(1.934)
COVID dummy (t-1)	-0.157	-0.159	-0.157	-0.291	-0.295	-0.292	0.234	0.263	0.249
	(-0.735)	(-0.750)	(-0.739)	(-1.426)	(-1.415)	(-1.387)	(0.342)	(0.378)	(0.359)
OECD/EU dummy (t-1)	-0.754	-0.825*	-0.755	-5.164***	-5.158***	-5.143***	-0.465	-0.565	-0.444
	(-1.505)	(-1.646)	(-1.497)	(-17.940)	(-14.417)	(-19.146)	(-0.619)	(-0.687)	(-0.596)
Constant	-2.218***	-2.231***	-2.190***	3.507***	3.509***	3.517***	-1.907***	-1.832***	-1.936***
	(-6.554)	(-6.830)	(-7.107)	(4.341)	(3.290)	(3.666)	(-2.970)	(-2.805)	(-3.015)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of countries	42	42	42	30	30	30	10	10	10
Observations	2,593	2,593	2,593	1,707	1,707	1,707	771	771	771

Notes: Probit model, estimated with unbalanced panel data for 42 countries, 2000Q1-2022Q4. All explanatory variables are lagged by one quarter. Net and gross capital flows are 4 quarter moving averages. REER appreciation is measured by change in REER over the previous four quarters. Z-scores reported in parentheses are corrected for heteroscedasticity and autocorrelations. *** p<0.01, ** p<0.05, * p<0.1.

Inflow easing changes tend to follow periods of strong economic conditions, characterized by larger capital flows, absence of capital flow stop, positive output gaps and exchange rate appreciation as Table 7 shows. This is in line with the assumption that countries liberalize capital controls in a position of strength. The exact set of relevant variables differs across developmental groups. Countries with high inflow restrictiveness, measured by inflow FARI, tend to ease inflow controls, which suggests there is convergence towards more open financial accounts. The OECD or EU members are less likely to ease inflows, which reflects the fact that they typically liberalize inflow controls before joining the OECD or EU.

Table 7. Inflow easing ACI regression results

	All countries			Developing			Emerging			Advanced		
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Net capital flows (t-1)	-0.003			0.010			0.029***			-0.018**		
	(-0.509)			(0.304)			(2.700)			(-2.298)		
Gross capital inflows (t-1)		0.001			-0.010			0.013***			0.000	
		(0.879)			(-0.332)			(3.104)			(0.118)	
Capital stop (t-1)			-0.291**			-0.078			-0.322**			-0.187
			(-2.381)			(-0.225)			(-2.083)			(-0.986)
Output gap (t-1)	0.005	0.005	0.004	0.175**	0.174**	0.172**	0.003	0.003	0.002	0.040	0.050	0.043
	(1.595)	(1.611)	(1.384)	(2.074)	(1.978)	(2.080)	(0.909)	(0.929)	(0.714)	(1.354)	(1.553)	(1.347)
Credit gap (t-1)	-0.001	-0.000	-0.001	-0.134	-0.128	-0.131	-0.003	-0.003	-0.002	-0.002	0.002	0.002
	(-0.282)	(-0.082)	(-0.228)	(-1.283)	(-1.206)	(-1.204)	(-0.234)	(-0.216)	(-0.182)	(-0.388)	(0.585)	(0.458)
REER appreciation (t-1)	0.000	0.000	-0.001	0.021	0.027***	0.025***	-0.000	0.000	-0.000	-0.007	-0.007	-0.008
	(0.076)	(0.081)	(-0.263)	(1.499)	(2.833)	(5.103)	(-0.066)	(0.016)	(-0.113)	(-0.805)	(-0.753)	(-0.852)
FX reserve coverage (t-1)	-0.024	-0.022	-0.012	-0.401	-0.515	-0.460	0.125	0.150	0.168	-0.078	-0.106	-0.097
	(-0.289)	(-0.280)	(-0.149)	(-0.558)	(-0.709)	(-0.720)	(0.865)	(1.013)	(1.188)	(-0.884)	(-1.155)	(-1.045)
Inflow FARI (t-1)	2.906***	2.930***	2.959***	4.772	4.813	4.878	2.471***	2.561***	2.715***	3.409**	3.637**	3.575**
	(4.441)	(4.416)	(4.371)	(1.175)	(1.225)	(1.275)	(3.574)	(3.706)	(3.785)	(2.294)	(2.374)	(2.463)
Crisis dummy (t-1)	0.231	0.232	0.238				0.117	0.148	0.138	0.882*	0.727	0.723
	(0.733)	(0.730)	(0.756)				(0.287)	(0.363)	(0.334)	(1.776)	(1.472)	(1.560)
COVID dummy (t-1)	-0.013	-0.009	-0.029	1.940**	1.909**	1.885**	-0.034	-0.102	-0.109	-0.008	0.035	0.002
	(-0.091)	(-0.062)	(-0.201)	(2.269)	(2.220)	(2.437)	(-0.182)	(-0.543)	(-0.604)	(-0.028)	(0.115)	(0.006)
OECD/EU dummy (t-1)	-0.667***	-0.678***	-0.728***				-0.680**	-0.677***	-0.701***	-0.826***	-0.839***	-0.916***
	(-3.271)	(-3.256)	(-3.453)				(-2.511)	(-2.697)	(-2.865)	(-2.925)	(-3.593)	(-3.810)
Constant	-2.079***	-2.085***	-1.994***	-3.092**	-2.804**	-2.960**	-1.680***	-1.692***	-1.641***	-2.036***	-2.163***	-2.046***
	(-7.179)	(-7.365)	(-7.044)	(-2.158)	(-2.009)	(-2.062)	(-4.204)	(-4.388)	(-4.196)	(-3.841)	(-4.452)	(-4.336)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of countries	67	67	67	5	5	5	37	37	37	25	25	25
Observations	4,592	4,592	4,592	270	270	270	2,447	2,447	2,447	1,875	1,875	1,875

Notes: Probit model, estimated with unbalanced panel data for 67 countries, 2000Q1-2022Q4. All explanatory variables are lagged by one quarter. Net and gross capital flows are 4 quarter moving averages. REER appreciation is measured by change in REER over the previous four quarters. Z-scores reported in parentheses are corrected for heteroscedasticity and autocorrelations. *** p<0.01, ** p<0.05, * p<0.1.

Finally, as Table 8 reports, outflow easing changes are similarly related to strong macroeconomic conditions in developing economies, while the identified relationships for advanced economies reflect lifting of crisis controls. For emerging and developing economies, periods characterized by higher net capital inflows, exchange rate appreciation, or high reserve accumulation, tend to promote an outflow easing change. For advanced economies, the results are more mixed with negative net capital inflows, exchange rate depreciation, and experience of crisis linked to higher likelihood of outflow easing. This can reflect fine-tuning of crisis outflow controls or their lifting once the crisis is over.

Table 8. Outflow easing ACI regression results

	All countries			Developing			Emerging			Advanced		
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Net capital flows (t-1)	-0.003			-0.004			0.032**			-0.021**		
	(-0.418)			(-0.093)			(2.449)			(-2.290)		
Gross capital outflows (t-1)		0.001			-0.030			0.001			0.001	
		(0.520)			(-0.452)			(0.398)			(0.383)	
Capital retrenchment (t-1)			-0.066			0.709			-0.075			0.006
			(-0.710)			(1.240)			(-0.737)			(0.023)
Output gap (t-1)	0.005	0.005	0.005	0.041	0.042	0.044	0.004	0.003	0.003	0.037	0.045	0.045*
	(1.598)	(1.605)	(1.574)	(0.837)	(0.806)	(0.733)	(1.211)	(1.180)	(1.160)	(1.497)	(1.592)	(1.684)
Credit gap (t-1)	-0.003	-0.002	-0.002	0.008	0.005	0.022	-0.016	-0.014	-0.014	-0.000	0.005	0.005
	(-0.505)	(-0.384)	(-0.449)	(0.045)	(0.030)	(0.125)	(-1.442)	(-1.308)	(-1.346)	(-0.063)	(1.103)	(0.984)
REER appreciation (t-1)	0.000	0.000	0.000	0.064	0.067*	0.081***	0.001	0.002	0.002	-0.018*	-0.016*	-0.016
	(0.160)	(0.164)	(0.107)	(1.547)	(1.851)	(3.333)	(0.348)	(0.650)	(0.624)	(-1.785)	(-1.652)	(-1.641)
FX reserve coverage (t-1)	0.043	0.045	0.044	1.524***	1.602***	1.967***	0.007	0.040	0.042	0.031	0.005	0.001
	(0.755)	(0.802)	(0.762)	(6.774)	(3.308)	(3.330)	(0.043)	(0.256)	(0.275)	(0.588)	(0.080)	(0.009)
Outflow FARI (t-1)	1.715***	1.726***	1.718***	12.968***	12.807***	12.729***	1.455***	1.527***	1.541***	1.755***	1.885***	1.878***
	(4.429)	(4.374)	(4.460)	(2.949)	(3.187)	(4.564)	(2.907)	(2.854)	(2.865)	(2.613)	(2.733)	(2.678)
Crisis dummy (t-1)	0.367	0.368	0.359				0.208	0.228	0.220	1.245**	1.040*	1.019*
	(1.170)	(1.154)	(1.152)				(0.604)	(0.646)	(0.628)	(2.154)	(1.776)	(1.938)
COVID dummy (t-1)	-0.032	-0.030	-0.037	-1.555**	-1.588**	-1.841**	0.174	0.106	0.100			
	(-0.243)	(-0.227)	(-0.280)	(-2.455)	(-2.325)	(-2.210)	(1.118)	(0.666)	(0.630)			
OECD/EU dummy (t-1)	-0.664***	-0.675***	-0.681***				-0.725***	-0.682***	-0.694***	-0.845	-0.857*	-0.816
	(-3.548)	(-3.744)	(-3.725)				(-4.225)	(-3.345)	(-3.534)	(-1.519)	(-1.800)	(-1.498)
Constant	-1.548***	-1.574***	-1.561***	-9.583***	-9.588***	-10.183***	-1.513***	-1.507***	-1.497***	-1.490**	-1.509**	-1.553**
	(-9.020)	(-8.857)	(-9.056)	(-4.550)	(-6.442)	(-12.108)	(-3.263)	(-2.927)	(-2.941)	(-2.129)	(-2.440)	(-2.069)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of IFSCode	67	67	67	6	6	6	38	38	38	23	23	23
Observations	4,508	4,508	4,508	291	291	291	2,449	2,449	2,449	1,684	1,684	1,684

Notes: Probit model, estimated with unbalanced panel data for 67 countries, 2000Q1-2022Q4. All explanatory variables are lagged by one quarter. Net and gross capital flows are 4 quarter moving averages. REER appreciation is measured by change in REER over the previous four quarters. Z-scores reported in parentheses are corrected for heteroscedasticity and autocorrelations. *** p<0.01, ** p<0.05, * p<0.1.

Overall, the results suggest that a variety of factors play a role in changing capital controls. Inflow tightening measures tend to be introduced to respond to large inflows, business and/or financial cycles, and in some countries FX pressures while housing booms appear to also matter. Outflow tightening measures tend to be triggered by economic or balance of payment crisis. On the other hand, countries tend to take advantage of strong cyclical positions to liberalize their capital controls. While these results are not uniformly applicable to all countries given high heterogeneity across countries, they support a range of conjunctures motivating capital controls in the literature.

3. Identification and robustness

Our findings are not free from caveats. Concerns on the robustness of the findings may arise, including from difficulties of identifications in reduced form regressions and characteristics of capital control policies that can be sparse in some countries.

We alleviate concerns on endogeneity arising from simultaneity or omitted variables in our specification. Simultaneity bias with capital controls estimations typically arises because capital controls are often imposed to influence macroeconomic conditions to which the policy reacted. As discussed in Binici and Das (2021), the focus on policy triggers, instead of the impacts of capital controls, makes this problem less relevant, especially with the use of lagged macroeconomic control variables. In addition, our benchmark regressions control for

country effects, and time fixed effects in the case of long-term analysis with FARI, as well as a rich set of observables. These controls absorb time-invariant country characteristics and common shocks, reducing the scope for simple omitted variable bias. Within the observable macroeconomic variables, pairwise correlations between the price and quantity variables are low, which mitigates multicollinearity concerns.

We also test the robustness of the benchmark results from the probit model for cyclical determinants, as reported in Table 9. Since our specification includes fixed effects, we applied analytically bias-corrected model following Cruz-Gonzalez, Fernández-Val, and Weidner (2017). In addition, since many countries implemented only few measures during our sample period (see Table 8.1), we also estimate all models with excluding countries with only one change in the dependent variable to mitigate the concerns that the results might be driven by a small number of observed changes. The estimated marginal effects from bias-corrected probit on the restricted sample remain similar in magnitude and significance to our baseline estimates.

Table 9. Robustness of ACI regression results

	Inflow tightening ACI		Outflow tightening ACI		Inflow easing ACI		Outflow easing ACI	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	Benchmark	Bias adjusted and restricted	Benchmark	Bias adjusted and restricted	Benchmark	Bias adjusted and restricted	Benchmark	Bias adjusted and restricted
Net capital flows (t-1)	0.003	-0.003	0.001	0.005	-0.003	-0.003	-0.003	-0.003
	(0.274)	(-0.346)	(0.240)	(0.635)	(-0.509)	(-0.406)	(-0.418)	(-0.431)
Output gap (t-1)	0.005*	0.023*	-0.021*	-0.030*	0.005	0.017	0.005	0.016
	(1.855)	(1.645)	(-1.679)	(-1.726)	(1.595)	(1.512)	(1.598)	(1.503)
Credit gap (t-1)	0.011**	0.009*	-0.003	-0.001	-0.001	-0.000	-0.003	-0.002
	(2.553)	(1.780)	(-0.983)	(-0.260)	(-0.282)	(-0.014)	(-0.505)	(-0.514)
REER appreciation (t-1)	0.009**	0.006	-0.004	-0.003	0.000	-0.000	0.000	-0.000
	(2.068)	(1.146)	(-0.856)	(-0.590)	(0.076)	(-0.121)	(0.160)	(-0.079)
FX reserve coverage (t-1)	0.099	0.163*	0.019	0.075	-0.024	-0.036	0.043	0.034
	(1.473)	(1.802)	(0.155)	(0.720)	(-0.289)	(-0.639)	(0.755)	(0.538)
Inflow or outflow FARI (t-1)	0.320	0.412	0.402	0.565	2.906***	2.963***	1.715***	1.674***
	(0.529)	(0.885)	(1.117)	(1.505)	(4.441)	(8.453)	(4.429)	(6.780)
Crisis dummy (t-1)			0.233	0.236	0.231	0.242	0.367	0.370
			(0.892)	(0.529)	(0.733)	(0.606)	(1.170)	(0.988)
COVID dummy (t-1)	0.979***	0.853***	-0.157	-0.254	-0.013	-0.039	-0.032	-0.041
	(7.051)	(6.192)	(-0.735)	(-1.069)	(-0.091)	(-0.253)	(-0.243)	(-0.265)
OECD/EU dummy (t-1)	-0.007	-0.035	-0.754	-3.180	-0.667***	-0.634***	-0.664***	-0.645***
	(-0.021)	(-0.110)	(-1.505)	(-0.032)	(-3.271)	(-2.822)	(-3.548)	(-2.873)
Parallel market dummy (t-1)			0.326*	0.287				
			(1.884)	(1.268)				
Constant	-2.274***		-2.218***		-2.079***		-1.548***	
	(-6.205)		(-6.554)		(-7.179)		(-9.020)	
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of countries	67	49	42	31	67	58	67	53
Observations	4,847	3,365	2,593	1,818	4,592	3,953	4,508	3,554

Notes: For each type of ACI, the table reports 1) benchmark regression results and 2) estimates with analytical bias correction (Cruz-Gonzalez and others, 2017) and based on a restricted sample covering countries with 2 or more changes over the sample period. Z-scores reported in parentheses are corrected for heteroscedasticity and autocorrelations. *** p<0.01, ** p<0.05, * p<0.1

V. Conclusion

Capital controls have been the subject of significant interest among policy makers and researchers. The discussion on many of the issues related to capital controls is far from being settled, even though these measures have been around as part of the policy toolkit for a long time. Some policymakers have argued about their usefulness under certain conditions while others cite their disadvantages and harmful domestic or spillover effects. The IMF has acknowledged that restrictions on capital flows can be useful in certain circumstances

both in response to capital flow surges and preemptively. The multifaceted nature of these measures regularly piques the interest of researchers prompting new additions to the already voluminous capital flow literature.

In this paper, we contribute to this strand of literature by providing new evidence on the motivation to use capital controls and offering two new datasets based on the AREAER which complement each other in assessing the level and changes in countries' restrictiveness. The indices also complement other existing indices which are based on the AREAER. Both indices will be updated and made available every year when the yearly update of the AREAER is published on the AREAER website which is publicly accessible. This, together with the quarterly and monthly availability of the indices, will hopefully facilitate the use of the indices by researchers for future analysis of capital flow-related topics.

Our empirical analysis provides evidence that three different objectives motivate countries to use or dismantle capital account restrictions. Policymakers tend to liberalize capital controls to reap the benefits of free capital flows, and they tend to introduce or tighten them to manage business or financial cycles, or a currency and sovereign debt crisis. In particular, our analysis indicates that when inflow controls are tightened, they are implemented countercyclically, reacting to overheating, currency overvaluation, housing market booms, or financial stability concerns, with exact concerns varying across countries.

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Annex I. Data sources and description

Variable	Description	Source
PPP GDP per capita	Expenditure-side real GDP at chained PPPs in 2017 US dollars, divided by population. Data coverage: 1999-2019.	Penn World Table 10.01, Feenstra and others (2015)
Total capital flows (stock)	Sum of total assets (excluding gold) and total liabilities as percent of GDP	Lane and Milesi-Ferretti (2018)
External liabilities	Total external liabilities in percent of GDP	Lane and Milesi-Ferretti (2018)
External assets	Total external assets excluding gold in percent of GDP	Lane and Milesi-Ferretti (2018)
Pegged exchange arrangement	Binary dummy indicating one of the following arrangements: conventional peg, crawling peg, currency board, exchange arrangement with no separate legal tender, pegged exchange rate within horizontal bands.	IMF AREAER database
Free floating exchange arrangement	Binary dummy indicating free floating or independently floating.	IMF AREAER database
EU/OECD dummy	Binary dummy indicating the country's membership in the EU or OECD	Authors' calculation
Crisis dummy	Binary dummy indicating the occurrence of a currency crisis or a sovereign debt crisis	Laeven and Valencia (2018)
Exchange rate appreciation	Annual percent change in real effective exchange rates	IMF INS database
Government efficiency dummy	Binary dummy indicating higher than the median government effectiveness	World Bank WorldWide Governance Indicators
FX reserve coverage of imports	Number of months of foreign exchange reserve coverage of imports of goods and services, in log	Lane and Milesi-Ferretti (2018), BOP, IFS. WEO
Financial development index	A composite index based on the depth, access, and efficiency of their financial institutions and financial markets. Data ranges between 0 and 1.	IMF Financial Development Index Database
GDP per capita	Nominal GDP in the US dollar divided by population, in log	WEO Database
Parallel market dummy	Binary dummy indicating greater than 2 percent parallel market premium or finding of a multiple currency practice (excluding potentiality based one) by the IMF.	Economic Freedom of the World, The Fraser Institute; IMF staff reports
Capital inflows / outflows / net	Gross capital inflows, outflows, or net (inflows minus outflows) in percent of GDP	IMF Financial Flows Analytics database (Vintage February 2024)
Output gap	Deviations of real GDP from one-sided HP trends, in precent of GDP	IFS
Credit gap	Credit-to-GDP ratio in deviations from one-sided HP trends	IFS, Lane and Milesi-Ferretti (2018)
Dummies for capital surge / stop / flight / retrenchment	Binary dummy indicating if the quarter is part of an episode; 0 otherwise. Following Forbes and Warnock (2012), surge (or stop / flight / retrenchment) episodes are defined as (1) year-over-year change in four-quarter gross capital inflows is more (or, respectively, gross capital inflows is less / gross capital outflows is more / gross capital outflows is less) than two standard deviations above the historical average during at least one quarter of the episode; (2) the episode lasts for all consecutive quarters for which the year-over-year change in annual gross capital flows deviate more than one standard deviation above the historical average; and (3) the episode lasts longer than one quarter.	IMF Financial Flows Analytics database (Vintage February 2024)

Annex II. Covered economies

	Africa	Asia	Europe	Americas	Middle East and Central America
Advanced		Australia Hong Kong SAR Japan Korea Macao SAR (2021-) New Zealand Singapore	Andorra (2020-) Austria Belgium Cyprus Czech Republic Denmark Estonia Finland France Germany Greece Iceland Ireland Israel Italy Latvia Lithuania Luxembourg Malta Netherlands Norway Portugal San Marino Slovak Republic Slovenia Spain Sweden Switzerland United Kingdom	Canada United States	
Emerging	Angola Botswana Equatorial Guinea Eswatini Gabon Mauritius Namibia Nigeria Seychelles South Africa	Brunei Darussalam China Fiji India Indonesia Malaysia Mongolia Nauru (2015-) Palau Philippines Sri Lanka Thailand Vietnam	Albania Belarus Bosnia and Herzegovina Bulgaria Croatia Hungary Kosovo (2009-) Montenegro (2006-) North Macedonia Poland Romania Russia Serbia (2000-) Türkiye Ukraine	Antigua and Barbuda Argentina Aruba Bahamas, The Barbados Belize Bolivia Brazil Chile Colombia Costa Rica Curaçao and Sint Maarten Dominican Republic Ecuador El Salvador Guatemala Guyana Jamaica Mexico Panama Paraguay Peru St. Kitts and Nevis Suriname Trinidad and Tobago Uruguay Venezuela	Algeria Armenia Azerbaijan Bahrain Egypt Georgia Iran Iraq Jordan Kazakhstan Kuwait Lebanon Libya Morocco Oman Pakistan Qatar Saudi Arabia Syria Tunisia Turkmenistan United Arab Emirates
Developing	Benin Burkina Faso Burundi Cabo Verde Cameroon Central African Republic Chad Comoros Congo, Democratic Republic of the" Congo, Republic of Côte d'Ivoire Eritrea Ethiopia Gambia, The Ghana Guinea Guinea-Bissau Kenya Lesotho Liberia Madagascar Malawi Mali Mozambique Niger Rwanda "São Tomé and Príncipe" Senegal Sierra Leone South Sudan (2012-) Tanzania Togo Uganda Zambia Zimbabwe	Bangladesh Bhutan Cambodia Kiribati Lao P.D.R. Maldives Marshall Islands Micronesia Myanmar Nepal Papua New Guinea Samoa Solomon Islands Timor-Leste (2002-) Tonga Tuvalu (2021-) Vanuatu	Moldova	Dominica Grenada Haiti Honduras Nicaragua St. Lucia St. Vincent and the Grenadines	Afghanistan Djibouti Kyrgyz Republic Mauritania Somalia Sudan Tajikistan Uzbekistan Yemen

Notes: "Advanced" economies correspond to IMF's classification for World Economic Outlook. "Developing" economies refer to the countries eligible to IMF's Poverty Reduction and Growth Trust (PRGT) facilities. The rest is classified as "Emerging" economies. Historical classifications as of end-2022 are used to match the last observations of our indices at the time of construction.

Annex III. Compilation of the Indices

Introduction

This annex describes the construction of the AREAER indices proposed in the paper. The AREAER is one of IMF's oldest publications with the first edition published in 1950. It serves as a unique database of information on individual members' exchange arrangements and exchange restrictions, trade systems, and capital controls. The AREAER draws on information available to the IMF from a number of sources, including that provided in the course of official staff visits to member countries, and is prepared in close consultation with national authorities. Over time, the AREAER evolved with a major transformation with the 1997 publication. The expanded and tabular format introduced then made it easier to summarize the information into indices.[27] Two types of indices are developed and discussed below. First, the Financial Account Restrictiveness Index (FARI) and its subindices, followed by the AREAER Change Index (ACI) and its subindices.

The AREAER Financial Account Restrictiveness Index (FARI)

The basic data

With the introduction of the tabular format, all information in the AREAER has been arranged into categories, which typically refer to cross-border transactions, usually corresponding to BOP categories.[28] In addition to sections on exchange rate arrangements, trade related categories, and financial sector specific regulations, there is a separate section on capital transactions. The advantage of having such categories is that each one can be assigned a qualitative value which then can be converted into a quantitative value.

Since the 2000 publication, the AREAER consistently includes a status value of "yes", "no", "n.r.", or "n.a." in each category, which serves as the basis for constructing indices. "Yes" indicates that a measure – such as a requirement, control, or practice stipulated by law – exists for the corresponding item (capital flow). "No" indicates that no such measures apply to the corresponding item. "n.r." indicates that country authorities have reported that the item is not regulated, and "n.a." indicates that, at the time of publication, there was no pertinent information available regarding the corresponding item. Thus, a status of "yes" indicates some form of control, while "no" implies that there are no restrictions on the transaction. In particular, in the capital transaction section of the AREAER template, a "yes" status indicates capital controls where regulation directly restricts that specific transaction (either its conclusion or the related payment/transfer, including the purchase of

[27] Only with the 2000 publication (which contains data for 1999), the status value field of the tabular format was consistently populated; hence our indices start from 1999. The binary restrictiveness index could be extended back to 1996 for all countries (and to 1995 for the 52 countries that provided data in the 1996 AREAER Special Supplement issue) but would require filling in the missing status values based on information provided in each individual country chapter for the relevant categories used in the construction of the index.

[28] The AREAER includes information on exchange arrangements and trade related restrictions which do not necessarily correspond to BOP financial account categories and are not directly relevant for the construction of the FARI or the ACI, and therefore are not included in the indices, but can provide useful background information and context to the interpretation of individual countries' indices.

FX for such purpose) for residents or nonresidents.[29] A requirement for notification for statistical purposes of a completed capital transaction would be accompanied by a status value of "no," as it does not restrict the execution of the transaction. By contrast, a requirement for prior approval of a capital transaction is accompanied by a status value of "yes". There are a few exceptions, as discussed below, where the meaning is reversed: a "yes" status indicates the transaction is permitted, while a "no" status implies the opposite.

It should be noted that the AREAER reports *de jure* regulations. Enforcement of these controls has a considerable impact on the restrictiveness of transactions. In practice, implementation of the controls often differs from the measures described in the relevant laws and regulations, either imposing more stringent conditions or not enforcing the controls at all, thereby rendering the *de jure* controls ineffective. At the same time, the absence of any control reported in the AREAER does not necessarily imply that no measure exists in practice.[30] Therefore, binary indices based on the AREAER reflect *de jure* controls and not *de facto* capital controls. Consequently, some researchers use a *de facto* measure related to actual capital flows. One commonly used measure is the sum of external assets and liabilities relative to GDP (Lane and Milesi-Ferretti, 2018).

Construction of the FARI and subindices

The FARI is the ratio of the number of "yes" statuses divided by the sum of "yes" and "no" statuses within the specified set of categories (see below). If the status is "n.a." or "n.r.", it is omitted from the calculation (both from the numerator and the denominator).[31] Hence, the FARI can range from 0 to 1, with 0 indicating the least restrictiveness and 1 indicating the greatest restrictiveness.

[29] The measures included in Section XI of the AREAER can also be considered to be capital flow management measures (CFMs) as defined by the IMF's *Institutional View on the Liberalization and Management of Capital Flows*. However, the AREAER does not use this terminology, because classifying a measure as a CFM requires substantial background information and considerable judgment, which is beyond the scope of the analysis conducted in compiling the AREAER database. CFMs encompass a broad spectrum of measures. For the purposes of the IMF's Institutional View, the term "capital flow management measures" refers to measures designed to limit capital flows. CFMs comprise residency-based CFMs, which include a variety of measures (such as taxes and regulations) affecting cross-border financial activity that discriminate on the basis of residency—also generally referred to as capital controls—and other CFMs, which do not discriminate on the basis of residency but are nonetheless designed to limit capital flows. These other CFMs typically include measures, such as some prudential measures, that differentiate transactions on the basis of currency, as well as measures that typically apply to the nonfinancial sector (IMF 2022a). The concept of capital controls in the AREAER is largely residency-based: it includes measures that regulate the conclusion or execution of transactions and transfers, as well as the holding of assets domestically by nonresidents and abroad by residents. In this respect, it is similar to the concept of restrictions in the OECD *Code of Liberalization of Capital Movements,* which considers measures as restrictions if they restrict the conclusion or execution of transactions between residents and nonresidents listed in the Code, and which is considered by the OECD as encompassing all cross border capital movements.

[30] For example, if access to foreign exchange is limited to certain current transactions only, capital flows are *de facto* controlled without any formal capital control measures in place.

[31] The "n.a." and "n.r." statuses cannot be assigned a value of 0 or 1, and are therefore omitted from the calculation. For "n.a.", no information is available, so it is impossible to determine if the category is controlled. For "n.r.", the interpretation varies across legal systems and may indicate a free or a restricted transaction. At times, this can result in estimates of restrictiveness relying on a limited number of categories, raising concerns about their accuracy. For example, in our empirical analysis in Section IV, we excluded a country if it did not report at least two status values of either "yes" or "no" for each of the three categories of capital flows (FDI, portfolio, other investment), and by their direction (inflow and outflow) respectively, for more than five years. These requirements led to the exclusion of seven countries from our sample.

What AREAER categories are included in the FARI?

The benchmark FARI is constructed as a broad index and hence includes controls across a wide range of categories representing different types of capital flows. To capture as comprehensively as possible of the types of capital flows and their associated controls, the index includes not only the subcategories of Section XI of the AREAER—which, in addition to the standard portfolio and direct investment categories, also covers cross-border lending and borrowing and real estate transactions— but also subcategories related to nonresidents' accounts in the country (Section VI of the AREAER), residents' accounts abroad (Section V of the AREAER), and surrender and repatriation requirements (Sections VIII, X, and XI of the AREAER). The account related subcategories are included reflecting their role in cross-border deposit transactions, such as when residents transfer funds to bank accounts abroad and vice versa. Surrender and repatriation requirements are included because they limit the ability of residents to transfer and hold capital abroad.

In addition, a few categories pertaining to commercial banks and other credit institutions under provisions specific to the financial sector (Section XII of the AREAER) are included in the broad index (Annex Table 1). In particular, differentiated treatment of nonresident deposits is included because such measure can restrict cross-border capital flows—for example, by imposing higher reserve requirements on nonresident deposits than resident deposits. In such cases, banks would likely pay lower interest on nonresident deposits if they are subject to higher reserve requirement charges. However, we do not include other categories from regulations specific to the financial sector (Section XII.A and XII.B.) to avoid duplications. According to the AREAER compilation guide, capital controls on banks and other nonbank financial institutions are already captured in the section on capital controls (Section XI), which covers restrictions on their investments abroad, including portfolio holdings, direct investments, lending, and real estate investments. Similarly, banks' ability to maintain accounts abroad is captured in the category "residents' accounts abroad" (Section V). Hence, if we included additional categories from Section XII it would lead to double counting.

Thus, as listed in Annex Table 1, 56 categories/subcategories are included in the construction of the FARI aggregate index.

Inflow vs Outflow

Besides the FARI aggregate index, we differentiate between inflows and outflows by constructing two subindices: the FARI Inflow, based on 30 categories, and the FARI Outflow, based on 26 categories. These subindices allow us to assess whether a country is more restrictive on capital inflows or outflows. For instance, a country may permit nonresident inflows while imposing controls on residents' outflows. As discussed in the main paper, outflows tend to be more restricted than inflows.

We classify AREAER capital transaction categories as inflow or outflow categories following the Balance of Payments (BOP) methodology. In BOP statistics, gross inflows are recorded when there is a change in domestic residents' liabilities to foreigners: an inflow with a positive sign occurs when the economy increases its external liabilities (equivalent to foreigners' purchasing domestic assets), while an inflow with a negative sign occurs when the economy reduces its external liabilities (equivalent to foreigners liquidating domestic assets). Gross outflows are recorded when there is a change in foreign assets owned by domestic residents: an outflow with a positive sign occurs when the economy increases its external assets (equivalent to residents purchasing foreign assets), and an outflow with a negative sign occurs when the economy reduces its external assets (equivalent to residents liquidating foreign assets). Accordingly, categories such as "Purchase locally by nonresidents" and "Sale or issue abroad by residents," which reflect changes in domestic residents' liabilities to foreigners, are classified as inflow categories. Conversely, categories such as "Sale or issue locally by

nonresidents" and "Purchase abroad by residents," which reflect changes in foreign assets owned by domestic residents, are classified as outflow categories (Annex Table 1).

Note that in line with this logic, categories such as liquidation of direct investments and the sale locally by nonresidents of real estate are treated as inflow controls, as they represent inflows with a negative sign. Controls on liquidation affect investment decisions in the same way as controls on initiating the investments. Similarly, settlement of debts abroad by immigrants typically involve an immigrant (resident) repaying debt abroad, resulting in a decrease in residents' liabilities to foreigners and hence constitute a negative inflow. In contrast, transfer into the country by immigrants (residents)—such as deposit transfer from nonresident banks to resident banks—reduces residents' foreign assets and hence constitute a negative outflow. Finally, transfer abroad by emigrants is classified as an inflow category, because emigrants are typically nonresidents; for example, when they transfer deposits from resident banks to nonresidents banks abroad, this reduces residents' liabilities to foreigners, generating a negative inflow.

Indices based on the direction of capital flows are constructed using the categories classified as inflow or outflow as discussed above. The FARI Inflow (FARI_I) and the FARI Outflow (FARI_O) indices are calculated as the ratio of the total number of "yes" statuses to the total number of "yes" and "no" statuses in the relevant categories listed in Annex Table 1. Statuses coded as "n.a." or "n.r." are excluded from the calculation, both from the numerator and the denominator. Consequently, FARI_I and FARI_O range from 0 to 1, where 0 indicates the least restrictive regime and 1 indicates the most restrictive regime for inflows and outflows, respectively.

Sub-indices

Four main subindices are calculated, corresponding closely to the four main categories of the financial account in the BOP statistics. These are: (1) foreign direct investments (FARI_FDI); (2) portfolio investments (FARI_PI); (3) financial derivatives (FARI_D); and (4) other investments (FARI_OI). The FDI subindex is based on 6 categories,[32] the portfolio investment subindex on 16 categories, the derivative subindex on 4 and other investment subindex on 30 categories (Annex Table 1). Corresponding inflow and outflow directional subindices are also calculated for each of these four subindices, using the categories listed in Annex Table 1.

FARI: Number of Categories in subindices

	Aggregate	Inflow	Outflow
FARI_FDI	6	4	2
FARI_PI	16	8	8
FARI_D	4	2	2
FARI_OI	30	16	14

In some instances, it is not possible to map the AREAER categories directly to a category in the BOP statistics as controls reported in one AREAER category may affect more than one type of BOP flow. In particular, restrictions or controls on repatriation of proceeds and surrender requirements, which can affect different types of BOP flows in addition to other investment flows, is included in the "Other investments" subindices (aggregate and outflow).

Adjustments to underlying data

(1) Extrapolation to monthly and quarterly frequency

One of the key innovations of the AREAER indices is that the status values reflect, as much as possible, the actual month in which a change occurred. This is achieved by extrapolating the annual status values to monthly

[32] Real estate transactions are included in FDI as per the BOP Manual 6.

frequency utilizing the position date reported in each country chapter and cross-referencing a record of policy changes. The information on the position date is available at the top of each country chapter for each year. By default, this date is December 31 of the reporting year (the year immediately preceding the publication year; for example, the AREAER published in 2016 would have a default position date of December 31, 2015). However, many countries provide information on developments during the publication year, in which case the position date reflects the latest month for which information was provided during the publication year. In recent years, this practice has become the norm for most countries.

To illustrate how position dates are used to extrapolate annual status values to monthly values, consider the following example. If the status value is recorded as “yes” at a position date of end-March 2016, this “yes” is extrapolated backward month by month until the month immediately following the previous edition’s position date (say, end-April 2015). The same procedure is then applied from that earlier position date. If the status was also “yes” at end-April 2015, the “yes” is extrapolated backward until the next earlier position date, and so on. The status value may differ between two position dates: continuing the example, suppose the status at end-April 2015 was “no.” This implies that the status must have switched at some point between May 2015 and March 2016 due to a policy action. In such cases, the database is searched for any recorded change in the relevant categories with an effective date that could explain the switch. If such a change is identified, the monthly extrapolation is adjusted so that the status is switched in the month of the effective change. For example, if a change recorded in January 2016 resulted in the status switching to “yes,” then “yes” would be extrapolated from January 2016 through March 2016, and “no” from December 2015 backward through May 2015. This adjustment ensures that the end-2015 status value is correctly reported as “no” and not as “yes”. A total of 531 such effective dates were identified and used to ensure accurate timing of a switch in the status value (see Annex Table 2).

It is not always possible to identify an effective date. Some changes in status values reflect improved reporting of existing regulations rather than actual changes in the legal framework. Such changes are not associated with an effective date and are thus treated as occurring at the time of reporting (i.e. the position date). Nevertheless, by incorporating the position dates and effective dates where available, the resulting monthly series of status values is more accurate, which also improves the accuracy of the end-year status values.

These adjustments are novel and not applied in other available indices based on the AREAER, and facilitate the construction of the monthly and quarterly indices that support higher-frequency analysis. Our annual index is constructed based on the December status for each year, while the quarterly indices reflect the status at the end of March, June, September and December. Without the above-mentioned adjustments—and instead relying solely on the status values reported in the annual AREAER publications—we would end up comparing restrictiveness across countries at different points in time, particularly for those reporting different position dates. One country may report its status as of end-December, while another may report as of, say, end-March. This discrepancy may be inconsequential if no changes occurred between December and March, but it becomes significant if substantial liberalization or tightening takes place during this period.

(2) OECD

In 2005, there was an initiative to harmonize the AREAER database with the OECD Code of Liberalization of Capital Movements (the Code). As part of this effort, many restrictions on outflows recorded in the Code were incorporated into the AREAER, resulting in a noticeable “jump” in indices based on the AREAER status

values.[33] Since this change applied only to the OECD countries, it had a particularly large impacts on the indices for European and other advanced economies.
In constructing the FARI, we addressed this structural change by adjusting the underlying existence values for OECD member countries. Most of the newly incorporated information reflected long-standing measures, meaning that the observed structural break in the AREAER time series did not correspond to any actual policy action. Instead, it arose solely from the synchronization between the AREAER and the Code. To remove this artificial break, the existence values for the affected items were revised for earlier years of the AREAER in line with the updates introduced through the harmonization with the Code, prior to calculating the FARI. These adjustments affected data for 1999 – 2005 (see Annex Table 3). As a result, the FARI does not exhibit the significant jump seen in other indices that do not apply this correction. It is also worth noting that the ACI is unaffected, as it is based on reported changes in the AREAER and therefore does not rely on the manually updated existence values.

(3) Non-OECD
Additional adjustments were made to the status values of all countries to correct reporting errors. These corrections included comparing status values across different years, identifying instances where a status changed in a particular year without explanation but then reverted in the following edition, and correcting inconsistencies between the recorded status values and the accompanying descriptions of measures. For example, such inconsistencies can be identified when the description clearly indicates the presence of reported controls, yet the status value is recorded as “no.”[34]

(4) Reversing status values
As noted above, in principle, “yes” status value indicates that restrictions are imposed on a particular transaction. However, there are a few categories in the AREAER—specifically those related to resident and nonresident accounts (Sections V and VI)—where “yes” instead indicates that the transaction is permitted. For instance, in the category “foreign exchange accounts permitted” by a nonresident, “yes” indicates the absence of restrictions, in contrast to its meaning in most other categories. Since the index is designed to interpret “yes” as indicating a restriction, the status values in these categories were reversed to “no” to calculate the index.

The AREAER Change index (ACI)

The basic data
The annual update of the AREAER records changes to the exchange system that occurred during the reporting period. For each country, this information is summarized in a table at the bottom of the country chapter under the title “Changes in YYYY and YYYY.” In the current AREAER template, these changes are organized by section and reported under each relevant subcategory, consistent with how developments are presented in the main country table. In addition to describing the nature of each change, the table provides the exact effective date (month/day/year). Prior to the 2017 AREAER, however, the changes were grouped under the section heading rather than listed separately under each affected subcategory in the Changes table (see below). As a

[33] Since then, the editions of the Code serve as additional source of information for the AREAER.

[34] Such adjustments were primarily needed because retroactive corrections in the AREAER database are lagged.

result, when a change affected multiple subcategories within a section, it appeared only once under the section heading, unlike the current format where it is repeated under each subcategory to which it applies.[35]

Types of changes

All reported changes in the categories relevant for the ACI (see below) were classified by direction (easing, tightening, or neutral) and by flow type (inflow or outflow) based on the policy action described. Most neutral changes either do not discriminate by residency or currency, or involved regulatory adjustments that do not clearly either ease or tighten restrictions. To avoid double-counting, measures that were simply extended were, as far as possible, labeled as neutral. When a measure could affect both inflows and outflows, it was included in both indices. Measures related solely to national or international security were excluded from the change indices.[36]

As explained above, the flow type (inflow or outflow) classification follows the BOP concept. Because capital inflows (capital outflows) are conventionally calculated by the net incurrence of external liabilities (net acquisition of assets) in the BOP financial accounts statistics, measures that affect transactions recorded on the liability (asset) side are labeled as inflow (outflow) measures. Accordingly, measures that affect nonresidents' ability to liquidate investments and repatriate capital are classified as inflow measures, even though they influence an outward movement of funds.[37] Depending on analytical objectives, researchers may want to exclude these measures targeting the reversal of inflows.

What categories are included in the ACI?

Like the FARI, the benchmark ACI is constructed as a broad index. It includes changes reported in the description of the categories included in the FARI and in their parent categories. The relevant information appears in the "Changes" table at the bottom of each country chapter. Historically, information on changes was grouped and reported under the section or subsection heading (including parent or top-level category). Even under the current reporting format, some changes continue to be reported at the parent or top-level category rather than in the subcategory, i.e., the lowest level of breakdown in the AREAER. To avoid missing relevant policy actions, the ACI therefore includes changes reported at the parent category level.[38] In addition, the ACI incorporates capital control changes from one category not included in the FARI: Category XII.A.9 "Open

[35] It is possible that country authorities do not report the specific date of a change that occurred within the reporting period, and the AREAER is published without the change captured in the "Changes" table at the bottom of the country chapter. In such cases, the ACI would not reflect this change. However, if the country authorities provide the date in a later update, the information can be incorporated into the online database retroactively. The ACI would then also be revised retroactively to reflect this information on the past change.

[36] Occasionally, countries report measures related to national or international security in the capital transactions section, although most of such measures are recorded in a separate category specifically designed to capture such measures (Category II.B. in the AREAER template).

[37] Often such measures are tightened to prevent the reversal of capital flows during a crisis, and subsequently eased.

[38] For example, Category XI.A.2.a.1. "Shares or other securities of a participating nature" is the parent category of four subcategories (See Annex Table 4). Parent categories serve as summaries or headings for the types of transactions detailed in their subcategories, and their status values are derived from the status values of their subcategories. For instance, if at least one subcategory has a "yes" status, the parent category will also be assigned a "yes." Because the FARI is constructed using the status values of individual subcategories, the parent-category status is redundant and excluded from the FARI (see Annex Table 1).

foreign exchange position limits."[39] For instance, asymmetric open foreign exchange position limits are often considered capital controls because they can influence capital flows, and such changes are included in the ACI. Aside from this item, the ACI closely tracks the FARI. Annex Table 4 lists all categories under which changes are reported and included in the main ACI and its subindices, grouped as closely as possible according to the BOP classification.

Construction of the ACI and subindices

Four main change indices are constructed: ACI Inflow Easing (ACI_IE), ACI Inflow Tightening (ACI_IT), ACI Outflow Easing (ACI_OE), and ACI Outflow Tightening (ACI_OT). Each index is calculated by summing the number of relevant changes in each month (or quarter/year), based on the exact effective date of the measure. Accordingly, for any country, the values of ACI_IE, ACI_IT, ACI_OE, and ACI_OT in a given period take on values of 0 or any positive integer. Changes classified as neutral—those that cannot be clearly identified as easing or tightening—are excluded.

Using these four indices, two net aggregate indices are derived.

Net Inflow (ACI_I) = ACI Inflow Tightening (ACI_IT) minus ACI Inflow Easing (ACI_IE)

Net Outflow (ACI_O) = ACI Outflow Tightening (ACI_OT) minus ACI Outflow Easing (ACI_OE)

These indices can be constructed at monthly, quarterly, or annual frequency. For instance, a negative value in any quarter for either net index indicates that more easing measures than tightening measures were implemented during that period.

Sub-indices

Similar to the FARI, the ACI subindices are constructed by counting the changes recorded in the four main categories of the financial account in the BOP statistics (Annex Table 4). These categories are: (1) foreign direct investments (ACI_FDI); (2) portfolio investments (ACI_PI); (3) financial derivatives (ACI_D); and (4) other investments (ACI_OI). For each category, the corresponding inflow and outflow directional subindices are calculated as described in the text table above. Annex Table 4 lists the specific AREAER categories included in each subindex.

ACI Subindices						
Subindices	**Inflow Easing**	**Outflow Easing**	**Inflow Tightening**	**Outflow Tightening**	**Net Inflow**	**Net Outflow**
ACI_FDI	✔	✔	✔	✔	✔	✔
ACI_PI	✔	✔	✔	✔	✔	✔
ACI_D	✔	✔	✔	✔	✔	✔
ACI_OI	✔	✔	✔	✔	✔	✔

Note: Net indices are calculated as Tightening minus Easing.

Adjustment for structural break in yearly changes data post 2015

Starting with the 2017 AREAER publication (covering 2016 data), the yearly changes table reports changes under each subcategory as listed in the main country table. As a result, the yearly changes table is now aligned with the structure of the country table, in which a regulatory change may appear in more than one subcategory within a section. As noted earlier, prior to 2016, a regulatory change that affected multiple subcategories within a section was reported only once under the section heading (parent category) in the yearly changes table. This

[39] Note that a "yes" status in this category does not indicate the existence of capital control and is therefore not included in the FARI. At the same time, not all changes to net open position affects capital flows. Only those changes that are considered a form of capital control are included in the ACI.

shift in recording practices is most likely to affect sections with several first- and second-tier subcategories (such as Section XI which is an important component of the ACI). To ensure comparability of the count of changes across the full dataset, we identify “duplicate” changes for the years 2016 onwards. In practice, this means reorganizing the yearly changes for these years to match the earlier reporting practice and dropping such “duplicate” changes from the count used to construct the ACI and its subindices. Over time, as more years accumulate under the new reporting format, it may become feasible to begin the time series from the 2017 publication and discontinue the elimination of duplicate changes[40].

Publication of FARI and ACI

The FARI and ACI (aggregate, inflow, and outflow indices), along with their subindices, will be made available on the publicly accessible AREAER online website. Going forward, these indices will be updated annually in line with the AREAER publication cycle. Users will be able to download each index by country, by year, and by standard country groupings including income and regional classifications. In addition, once users download individual country indices, they will be able to create average indices of groups of their interest.

[40] Consideration can be given to extend the series backwards as well to ensure a consistent and more accurate breakdown of the ACI.

Annex Table 1. Underlying Transactions by Balance of Payment Categories in the FARI

Index[1]	Code[2]	Category[3]	FARI	FARI Inflow	FARI Outflow
		Foreign direct investments	**6**	**4**	**2**
XI.A.5.		**Controls on direct investment**			
XI.A.5.a.	171	Outward direct investment (1995 -)	✓		✓
XI.A.5.b.	172	Inward direct investment (1995 -)	✓	✓	
XI.A.6.	186	Controls on liquidation of direct investment (1995 -)	✓	✓	
XI.A.7.		***Controls on real estate transactions***			
XI.A.7.a.	201	Purchase abroad by residents (1995 -)	✓		✓
XI.A.7.b.	202	Purchase locally by nonresidents (1995 -)	✓	✓	
XI.A.7.c.	203	Sale locally by nonresidents (1995 -)	✓	✓	
		Portfolio Investments	**16**	**8**	**8**
XI.A.2.a.1		**Shares or other securities of a participating nature**			
XI.A.2.a.1.i.	23	Purchase locally by nonresidents (1995 -)	✓	✓	
XI.A.2.a.1.ii.	25	Sale or issue locally by nonresidents (1995 -)	✓		✓
XI.A.2.a.1.iii.	27	Purchase abroad by residents (1995 -)	✓		✓
XI.A.2.a.1.iv.	29	Sale or issue abroad by residents (1995 -)	✓	✓	
XI.A.2.a.2.		***Bonds or other debt securities***			
XI.A.2.a.2.i.	24	Purchase locally by nonresidents (1997 -)	✓	✓	
XI.A.2.a.2.ii.	26	Sale or issue locally by nonresidents (1997 -)	✓		✓
XI.A.2.a.2.iii.	28	Purchase abroad by residents (1997 -)	✓		✓
XI.A.2.a.2.iv.	30	Sale or issue abroad by residents (1997 -)	✓	✓	
XI.A.2.b.		***On money market instruments***			
XI.A.2.b.1.	35	Purchase locally by nonresidents (1995 -)	✓	✓	
XI.A.2.b.2.	36	Sale or issue locally by nonresidents (1995 -)	✓		✓
XI.A.2.b.3.	37	Purchase abroad by residents (1995 -)	✓		✓
XI.A.2.b.4.	38	Sale or issue abroad by residents (1995 -)	✓	✓	
XI.A.2.c.		***On collective investment securities***			
XI.A.2.c.1.	40	Purchase locally by nonresidents (1995 -)	✓	✓	
XI.A.2.c.2.	41	Sale or issue locally by nonresidents (1995 -)	✓		✓
XI.A.2.c.3.	42	Purchase abroad by residents (1995 -)	✓		✓
XI.A.2.c.4.	43	Sale or issue abroad by residents (1995 -)	✓	✓	
		Derivatives	**4**	**2**	**2**
XI.A.3.		***Controls on derivatives and other instruments***			
XI.A.3.a.	83	Purchase locally by nonresidents (1995 -)	✓	✓	
XI.A.3.b.	84	Sale or issue locally by nonresidents (1995 -)	✓		✓
XI.A.3.c.	85	Purchase abroad by residents (1995 -)	✓		✓
XI.A.3.d.	86	Sale or issue abroad by residents (1995 -)	✓	✓	
		Other investments	**30**	**16**	**14**
XI.A.4.		**Controls on credit operations**			
XI.A.4.a.		***Commercial credits***			
XI.A.4.a.1.	141	By residents to nonresidents (1995 -)	✓		✓
XI.A.4.a.2.	142	To residents from nonresidents (1995 -)	✓	✓	
XI.A.4.b.		Financial credits			
XI.A.4.b.1.	144	By residents to nonresidents (1995 -)	✓		✓
XI.A.4.b.2.	145	To residents from nonresidents (1995 -)	✓	✓	
XI.A.4.c.		Guarantees, sureties, and financial backup facilities			
XI.A.4.c.1.	147	By residents to nonresidents (1995 -)	✓		✓
XI.A.4.c.2.	148	To residents from nonresidents (1995 -)	✓	✓	
XI.A.8.		Controls on personal capital transactions			
XI.A.8.a.		Loans			
XI.A.8.a.1.	226	By residents to nonresidents (1997 -)	✓		✓
XI.A.8.a.2.	227	To residents from nonresidents (1997 -)	✓	✓	

Annex Table 1. Underlying Transactions by Balance of Payment Categories in the FARI (Continued)

Index[1]	Code[2]	Category[3]	FARI	FARI Inflow	FARI Outflow
XI.A.8.c.	228	***Settlement of debts abroad by immigrants (1997 -)***	✓	✓	
XI.A.8.d.		***Transfer of assets***			
XI.A.8.d.1.	230	Transfer abroad by emigrants (1997 -)	✓	✓	
XI.A.8.d.2.	231	Transfer into the country by immigrants (1997 -)	✓		✓
		Repatriation requirements			
VIII.A.	15	Proceeds from exports (1995)	✓		✓
X.A.	17	Proceeds from Invisible Transactions and Current Transfers (1995 -)	✓		✓
XI.A.1.	344	Proceeds from capital transactions (2006 -)	✓		✓
		Surrender requirements			
VIII.A.1.	16	Proceeds from exports (1995 -)	✓		✓
X.A.1.	18	Proceeds from Invisible Transactions and Current Transfers (1995 -)	✓		✓
XI.A.1.a.	345	Proceeds from capital transactions (2006 -)	✓		✓
VI.		***Nonresident Accounts***			
VI.A.	92	Foreign exchange accounts permitted (1995 -)	✓	✓	
VI.A.1.	93	Approval required (1995 -)	✓	✓	
VI.B.	127	Domestic currency accounts (1995 -)	✓	✓	
VI.B.1.	129	Convertible into foreign currency (1995 -)	✓	✓	
VI.B.2.	128	Approval required (1995 -)	✓	✓	
VI.C.	151	Blocked accounts (1995 -)	✓	✓	
V.		***Resident Accounts***			
V.A.		**Foreign exchange accounts permitted**			
V.A.2.	97	Held abroad (1995 -)	✓		✓
V.A.2.a.	96	Approval required (1995 -)	✓		✓
V.B.	288	Accounts in domestic currency held abroad (2000 -)	✓		✓
XII.A.7.		**Differential treatment of deposit accounts held by nonresidents**			
XII.A.7.a.	255	Reserve requirements (1997 -)	✓	✓	
XII.A.7.b.	254	Liquid asset requirements (1997 -)	✓	✓	
XII.A.7.c.	253	Interest rate controls (1997 -)	✓	✓	
XII.A.7.d.	252	Credit controls (1997 -)	✓	✓	
		Total number of categories	**56**	**30**	**26**

1. This is the numbering of sections and categories used in the online AREAER database.
2. This is a unique identification number assigned to each category and subcategory in the online AREAER database.
3. The year in parenthesis next to each category name indicates the first year in which data for that category was reported in the AREAER.

Annex Table 2. Number of Status Switches Based on Effective Date of Change

1999	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
6	5	45	11	12	12	7	25	13	26	4	6
2011	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	2022
7	4	31	11	49	10	50	42	79	21	26	29

Source: Authors' calculations.

Annex Table 3. Adjustment to End Period Status Values

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
OECD	113	121	122	124	128	127	1								
Non-OECD	6	7	7	4	5	4	4	3	3	3	5	5	5	5	3

Source: Authors' calculations.

Annex Table 4. Underlying Transactions by Balance of Payment Categories in the ACI

Index[1]	Code[2]	Category[3]	Inflow	Outflow
		Foreign direct investments		
XI.A.5.	170	**Controls on direct investment (1995 -)**	✓	✓
XI.A.5.a.	171	Outward direct investment (1995 -)		✓
XI.A.5.b.	172	Inward direct investment (1995 -)	✓	
XI.A.6.	186	Controls on liquidation of direct investment (1995 -)	✓	
XI.A.7.	200	**Controls on real estate transactions (1995 -)**	✓	✓
XI.A.7.a.	201	Purchase abroad by residents (1995 -)		✓
XI.A.7.b.	202	Purchase locally by nonresidents (1995 -)	✓	
XI.A.7.c.	203	Sale locally by nonresidents (1995 -)	✓	
		Portfolio Investments		
XI.A.2.	33	***Controls on capital and money market instruments (1995 -)***	✓	✓
XI.A.2.a.	31	*On capital market securities (1995 -)*	✓	✓
XI.A.2.a.1	34	*Shares or other securities of a participating nature (1997 -)*	✓	✓
XI.A.2.a.1.i.	23	Purchase locally by nonresidents (1995 -)	✓	
XI.A.2.a.1.ii.	25	Sale or issue locally by nonresidents (1995 -)		✓
XI.A.2.a.1.iii.	27	Purchase abroad by residents (1995 -)		✓
XI.A.2.a.1.iv.	29	Sale or issue abroad by residents (1995 -)	✓	
XI.A.2.a.2.	32	*Bonds or other debt securities (1997 -)*	✓	✓
XI.A.2.a.2.i.	24	Purchase locally by nonresidents (1997 -)	✓	
XI.A.2.a.2.ii.	26	Sale or issue locally by nonresidents (1997 -)		✓
XI.A.2.a.2.iii.	28	Purchase abroad by residents (1997 -)		✓
XI.A.2.a.2.iv.	30	Sale or issue abroad by residents (1997 -)	✓	
XI.A.2.b.	39	*On money market instruments (1995 -)*	✓	✓
XI.A.2.b.1.	35	Purchase locally by nonresidents (1995 -)	✓	
XI.A.2.b.2.	36	Sale or issue locally by nonresidents (1995 -)		✓
XI.A.2.b.3.	37	Purchase abroad by residents (1995 -)		✓
XI.A.2.b.4.	38	Sale or issue abroad by residents (1995 -)	✓	
XI.A.2.c.	44	*On collective investment securities (1995 -)*	✓	✓
XI.A.2.c.1.	40	Purchase locally by nonresidents (1995 -)	✓	
XI.A.2.c.2.	41	Sale or issue locally by nonresidents (1995 -)		✓
XI.A.2.c.3.	42	Purchase abroad by residents (1995 -)		✓
XI.A.2.c.4.	43	Sale or issue abroad by residents (1995 -)	✓	
		Derivatives		
XI.A.3.	82	**Controls on derivatives and other instruments (1995 -)**	✓	✓
XI.A.3.a.	83	Purchase locally by nonresidents (1995 -)	✓	
XI.A.3.b.	84	Sale or issue locally by nonresidents (1995 -)		✓
XI.A.3.c.	85	Purchase abroad by residents (1995 -)		✓
XI.A.3.d.	86	Sale or issue abroad by residents (1995 -)	✓	
		Other Investments		
XI.A	289	**Controls on capital transactions (2000 -)**	✓	✓
XI.A.4.	114	**Controls on credit operations (1995 -)**	✓	✓
XI.A.4.a.	143	***Commercial credits (1995 -)***	✓	✓
XI.A.4.a.1.	141	By residents to nonresidents (1995 -)		✓
XI.A.4.a.2.	142	To residents from nonresidents (1995 -)	✓	
XI.A.4.b.	146	***Financial credits (1995 -)***	✓	✓
XI.A.4.b.1.	144	By residents to nonresidents (1995 -)		✓
XI.A.4.b.2.	145	To residents from nonresidents (1995 -)	✓	
XI.A.4.c.	149	***Guarantees, sureties, and financial backup facilities (1995 -)***	✓	✓
XI.A.4.c.1.	147	By residents to nonresidents (1995 -)		✓
XI.A.4.c.2.	148	To residents from nonresidents (1995 -)	✓	

Annex Table 4. Underlying Transactions by Balance of Payment Categories in the ACI (continued)

Index[1]	Code[2]	Category[3]	Inflow	Outflow
XI.A.8.	222	**Controls on personal capital transactions (1997 -)**	✓	✓
XI.A.8.a.	225	***Loans (1997 -)***	✓	✓
XI.A.8.a.1.	226	By residents to nonresidents (1997 -)		✓
XI.A.8.a.2.	227	To residents from nonresidents (1997 -)	✓	
XI.A.8.c.	228	***Settlement of debts abroad by immigrants (1997 -)***	✓	
XI.A.8.d.	232	***Transfer of assets (1997 -)***	✓	✓
XI.A.8.d.1.	230	Transfer abroad by emigrants (1997 -)	✓	
XI.A.8.d.2.	231	Transfer into the country by immigrants (1997 -)		✓
		Repatriation requirements		
VIII.A.	15	Proceeds from exports (1995)		✓
X.A.	17	Proceeds from Invisible Transactions and Current Transfers (1995 -)		✓
XI.A.1.	344	Proceeds from capital transactions (2006 -)		✓
		Surrender requirements		
VIII.A.1.	16	***Proceeds from exports (1995 -)***		✓
VIII.A.1.a.	340	Surrender to the central bank (2006 -)		✓
VIII.A.1.b.	341	Surrender to authorized dealers (2006 -)		✓
X.A.1.	18	***Proceeds from invisible transactions and current transfers (1995 -)***		✓
X.A.1.a.	342	Surrender to the central bank (2006 -)		✓
X.A.1.b.	343	Surrender to authorized dealers (2006 -)		✓
XI.A.1.a.	345	***Proceeds from capital transactions (2006 -)***		✓
XI.A.1.a.1.	346	Surrender to the central bank (2006 -)		✓
XI.A.1.a.2.	347	Surrender to authorized dealers (2006 -)		✓
VI.		**Nonresident accounts**		
VI.A.	92	Foreign exchange accounts permitted (1995 -)	✓	
VI.A.1.	93	Approval required (1995 -)	✓	
VI.B.	127	Domestic currency accounts (1995 -)	✓	
VI.B.1.	129	Convertible into foreign currency (1995 -)	✓	
VI.B.2.	128	Approval required (1995 -)	✓	
VI.C.	151	Blocked accounts (1995 -)	✓	
V.		**Resident accounts**		
V.A.	94	Foreign exchange accounts permitted (1968 -)		✓
V.A.2.	97	Held abroad (1995 -)		✓
V.A.2.a.	96	Approval required (1995 -)		✓
V.B.	288	Accounts in domestic currency held abroad (2000 -)		✓
XII.A.7.	257	**Differential treatment of deposit accounts held by nonresidents (1997 -)**	✓	
XII.A.7.a.	255	Reserve requirements (1997 -)	✓	
XII.A.7.b.	254	Liquid asset requirements (1997 -)	✓	
XII.A.7.c.	253	Interest rate controls (1997 -)	✓	
XII.A.7.d.	252	Credit controls (1997 -)	✓	
XII.A.9.	263	**Open foreign exchange position limits (1995 -)**	✓	✓
XII.A.9.a.	267	On resident assets and liabilities (1997 -)	✓	✓
XII.A.9.b.	266	On nonresident assets and liabilities (1997 -)	✓	✓
		Total number of categories	**51**	**53**

1. This is the numbering of sections and categories used in the online AREAER database.
2. This is a unique identification number assigned to each category and subcategory in the online AREAER database. Changes reported under these codes are included in the calculation for the ACI and its subindices for 2016 onwards. Prior to 2016, changes were grouped together and reported only under the top level or section-heading categories (parent category). Accordingly, for earlier years, changes affecting capital flows reported under the following parent-category codes were included in the ACI: FDI: 170, 186, 200; Portfolio: 33; Derivatives: 82; and Other: 62, 114, 222, 344, 65, 63, 67, 68, 246.
3. The year in parenthesis next to each category name indicates the first year in which data for that category was reported in the AREAER.

Annex IV. Comparison to Existing Indices

Figure 1. ACI Compared to Pasricha and others (2018)

Sources: Pasricha and others (2018); and authors' calculations.
Note: The total count of changes for Pasricha and others (2018) includes "easingio" and "tighteningio" in the respective directions of total changes.

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