

Dataset on Capital Flow Measures in Emerging Markets

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Now includes 45 advanced and emerging economies, 2001Q1-2015Q4

The dataset covers 45 economies for the period 2001-2015 with quarterly frequency. Each data series counts the number of capital flow measures (for example, easings of inflow controls or tightenings of outflow controls) undertaken by each country. By identifying policy actions along six dimensions, this dataset provides granular information on capital flow measures for a large and representative sample of emerging and advanced economies. There are two types of counts available: weighted and unweighted. The weighted dataset weights each policy action by the share of the country's international assets or liabilities that the measure was designed to influence, while the unweighted dataset assigns an equal value to each measure.

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The dataset contains information on changes in capital controls (regulations on international financial flows that discriminate based on residency of transactor) as well as currency-based measures (measures that discriminate based on currency of transaction). The two groups of measures together can be referred to as capital flow measures (CFMs), as both can influence cross-border transactions in assets (capital flows).¹

This dataset uses a narrative approach — reading the text of the policy changes or descriptions of such changes in other sources — and converting them into numerical measures that capture the direction of policy. To achieve this, we follow several steps: first, as policy announcements often contain changes of several regulatory instruments, we identify individual CFMs from policy announcements by splitting the latter along six dimensions, giving the dataset a high degree of granularity. Second, we drop small changes from the dataset. Third, we construct weights for each CFM. Fourth, we construct summary measures that capture the net direction of policy, which are used in our empirical analysis.

The data are sourced from the descriptions in “Changes during year” section of the IMF Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER), from the press releases, circulars and notifications on the regulators’ and finance ministries’ websites, Organization for Economic Co-operation and Development (OECD) reports, news sources as well as other research papers. Even for the measures that we compile from AREAER, we cross-verify them from other sources, and in many cases, re-classify them as described in Step 1 below.

The countries in sample are: Argentina, Australia, Austria, Belgium, Brazil, Bulgaria, Canada, Chile, China, Colombia, Czech Republic, Denmark, Egypt, Finland, France, Germany, Hungary, India, Indonesia, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Malaysia, Mexico, Morocco, Netherlands, New Zealand, Norway, Peru, Philippines, Poland, Portugal, Russia, Saudi Arabia, South Africa, Spain, Sweden, Thailand, Turkey, United Kingdom and United States.

¹ This definition is different from the definition of capital flow management measures in the IMF Institutional View (IV). In the IV, capital flow management measures (CFMs) refer to measures designed to limit capital flows. These measures comprise residency based CFMs and other CFMs which do not discriminate based on residency but are nonetheless designed to limit capital flows. These could include currency-based measures as well as other measures.

The base dataset has a daily frequency and contains both the announcement and the effective dates of the regulatory changes. In order to aggregate the data into a quarterly dataset, we use the effective dates. While 21% of the changes in the unweighted dataset (after dropping minor changes in step 2) have different announcement and effective dates, for only 10% of the changes these lie in different quarters.

In the remainder of this Appendix we describe in detail the methodology for converting the narrative policy announcements into a numerical dataset. The Appendix ends with a comparison of existing CFM datasets in the literature.

Step 1: Separate policy announcements into policy actions by classifying them along 6 dimensions

A policy announcement for capital flow management can contain changes on multiple regulatory instruments.² Where this is the case, we split policy announcements into “capital flow measures”, each of which is counted individually. Each of the measures has a unique classification along the following six dimensions:

- I. International Investment Position (IIP) Category: Foreign Direct Investment [FDI], Portfolio Investment, Other investment or Financial Derivatives
- II. Type of Instrument: Quantitative/Price-based/Monitoring
- III. Discrimination by residency or currency: Capital Control or Currency-based?
- IV. Type of instrument: (Micro-) Prudential Type or not
- V. Direction of flow: Resident liabilities (inflows), Resident assets (outflows) or undefined
- VI. Policy stance: Easing or Tightening

We decompose a policy announcement into as many CFMs as needed to obtain a single identifier within each of the above 6 dimensions. For example, the 2012 AREAER has an entry for Argentina, dated 4 January 2012, stating that “Communication A 5264 adopted new exchange rules applicable to financial debts. The deadline for repatriating and settling foreign exchange related to financial debts abroad and issuance of foreign securities was reduced to 30 days.” This affects two categories of capital transactions, i.e. “Other Investment” (financial debts abroad) and

² For example, loan to value limits, interest ceilings, taxes, etc. are all separate regulatory instruments.

“Portfolio Investment” (issues of foreign securities). For both categories, this policy change represents a tightening of inflow controls, i.e. a stronger restriction on the use of foreign exchange obtained via foreign borrowing or listing of securities abroad. This announcement is therefore counted as two CFMs.

We discuss the classifications under each of the six dimensions in more detail below.

I. Classifying measures by IIP category (Portfolio flows, FDI, Financial Derivatives, Other Investment)

The IMF AREAER breaks down the broad category “capital transactions” into the following categories:

1. Repatriation requirements
2. Controls on capital and money market instruments;
3. Controls on derivatives and other instruments;
4. Controls on credit operations;
5. Controls on direct investment;
6. Controls on liquidation of direct investment;
7. Controls on real estate transactions;
8. Controls on personal capital transactions;

In addition, there is a separate category, “Provisions specific to the financial sector”.

We start by collecting AREAER and non-AREAER data for all of the above categories.³ However, these categories do not directly correspond to the balance of payments (capital flow) data and to the International Investment Position (IIP) data, the latter of which is used for weighting the changes. In particular:

- “Liquidation of direct investment” and “real estate transactions” are included in direct investment data in the IIP statistics.

³ The AREAER categories were used in previous versions of the dataset, Pasricha (2012) and Aizenman and Pasricha (2013). The AREAER categories have evolved over time. For example, the category repatriation requirements was added in the 2006 AREAER (published in 2007). Provisions specific to financial sector was separated from the capital transactions category in the 2005 AREAER (published in 2006).

- There are no analogous categories for “personal capital transactions” and “provisions specific to financial sector” in the IIP statistics. We re-classify policy measures under these AREAER categories into the remaining categories. The provisions specific to the financial sector are a special case, and we discuss the treatment of these in more detail under step 3 below.
- Finally, as IIP data contain separate categories for portfolio equity and portfolio debt, we can further decompose controls relating to capital and money market instruments into these two categories.

In order to weight the policy changes by the share of foreign asset/liabilities that they affect, we make the above AREAER classification consistent with the international assets/liabilities data. The final dataset has the following four IIP categories and two subcategories (Table 1).

Table 1: Classifying CFM measures by IIP category

	Code	IIP Category	AREAER Categories
1.	FDI	Foreign Direct Investment	Controls on direct investment; Controls on liquidation of direct investment; Controls on real estate transactions; Provisions specific to the financial sector
2.	O	Other Investment	Controls on credit operations; Controls on personal capital transactions; Provisions specific to the financial sector
3.	P	Portfolio Investment, of which:	Controls on capital and money market instruments; Provisions specific to the financial sector
		3.1 PD Portfolio Debt	Controls on capital and money market instruments; Provisions specific to the financial sector
		3.2 PE Portfolio Equity	Controls on capital and money market instruments; Provisions specific to the financial sector
4.	PDF	Financial Derivatives	Controls on derivatives and other instruments; Provisions specific to the financial sector

II. Classifying measures by type of instrument (price-based, quantitative, monitoring)

Changes in regulations that are price-based (for example, taxes on inflows, unremunerated reserve requirements, interest rate ceilings etc.) are counted separately from measures that are

quantitative (e.g. limits on total investment abroad by residents) or monitoring-related (e.g. approval requirements for external borrowing).

For example, the Reserve Bank of India announced the following changes to restrictions on foreign borrowing by Indian firms on 29 May 2008: (a) The maximum interest rate (all-in cost) at which resident firms could borrow abroad was increased from 150 to 200 basis points over six-month LIBOR for three- to five-year maturities and from 250 to 350 basis points over six-month LIBOR for above-five-year maturities. (b) The existing limit of USD 20 million per year on foreign borrowing for permissible rupee expenditures was raised to USD 100 million for firms in the infrastructure sector and USD 50 million for other firms, under the approval route. Of these changes, (a) is a price-based easing, while the (b) is easing of quantitative restrictions but on different borrowers. We count this announcement as two CFMs, one price-based and one quantitative.⁴

Several changes involve elements of both quantitative and monitoring measures. For example, increases in the limit up to which residents may invest abroad without approval. To classify such measures, the following rules of thumb were followed: A change is classified as monitoring if it lifts existing monitoring requirements partly or completely, changes limits beyond which approval/registration is needed, converts an approval requirement into a reporting requirement, changes the authority of or procedures for reporting/approval or introduces such requirements. For example, in Russia, prior approval requirements for residents selling or issuing securities abroad over USD 150,000 were lifted as of 1 July 2006. This measure is classified as a monitoring change because this is a removal of an approval requirement. On 13 March 2002, Argentina increased the monthly limit for residents' purchase of foreign exchange for foreign portfolio investment, without prior central bank approval (from USD 150,000 to USD 200,000). This is also classified as a monitoring change given that it is a change in an approval procedure.⁵ However, when a previously prohibited transaction is allowed (or a ceiling on a transaction

⁴ Pandey et al (2015) count this as three changes, as they count changes at instrument level. To the best of our knowledge, the other recent papers on CFMs including Forbes et al (2012), Bruno et al (2015) would count this as one easing, as they count changes by announcement dates, flow (inflow or outflow) and direction (tightening or easing).

⁵ In fact, the central bank's approval beyond the stated limits was reportedly almost never given (Abramovich and Mayora, 2012). Therefore, this could also be classified as a quantitative restriction. However, we consistently classify a change in approval procedures as a monitoring change given that it is not always clear how approval procedures were applied in practice.

increased), but only subject to approval, we classify it as a quantitative change because we see this change first and foremost as an increase in the relevant limit/ceiling.

III. Classifying measures by discrimination criteria (residency or currency-based)

Capital Controls are measures that discriminate based on residency of the transactor. Currency-based measures are measures that discriminate based on currency, for example, between transactions denominated in domestic vs. foreign currency. The classification along this dimension requires some degree of judgment, for which we use some rules of thumb.⁶ The following rules of thumb were used:

1. A CFM is classified as currency-based only when the restrictions are on assets denominated in foreign currency (as opposed to those denominated in domestic currency). Limits on holdings of foreign currency itself by residents or holdings of domestic currency by non-residents or on forward contracts (without underlying exposure) are classified as capital controls.
2. There are some measures with both a currency and a residency dimension. In that case, we use judgment to decide which element is more important. For example, a measure allowing non-residents to sell to residents of Russia, securities denominated in rubles for rubles (but settled in rubles or foreign exchange) without restriction is classified as a currency-based measure because the restriction is on the currency of denomination or settlement of securities rather than on the sale of securities per se.

IV. Classifying measures by type of instrument: (Micro-) prudential-type or other:

Prudential-type measures are regulations specific to the financial sector that differentiate based on currency or residency. These regulations are often found in the micro-prudential toolkit of financial regulators, for example, limits on open foreign exchange (FX) positions, limits on banks' investments in FX assets, differential reserve requirements on liabilities in local currencies and FX, differential reserve requirements on non-resident deposits, etc.

⁶ However, this classification is also not crucial to identifying or weighting the measures, as most announcements contain only one type of measure, once the other dimensions (type of instrument, IIP category etc.) have been taken into account.

To classify measures as prudential-type also can require some judgement and the following rules of thumb were used:

1. Among currency-based measures specific to the financial sector, measures that require hedging or increasing buffers against risks associated with certain transactions, but do not otherwise restrict them are classified as prudential-type. For example, reserve requirements, capital requirements, hedging requirements and open foreign exchange position limits are classified as prudential-type. Outright prescriptions or quantitative limits on the purchase of locally-issued foreign currency securities or other foreign currency assets, lending in foreign currency and interest rate ceilings on foreign currency deposits are in general classified as currency based “other” type.
2. Residency-based measures are classified as prudential-type when they apply to the financial sector and are similar to prudential currency-based measures (CBPT) in design or impact. For example, differential reserve requirements on non-resident deposits, which would have the same impact as a differential reserve requirement on foreign currency deposits if most foreign currency deposits are held by non-residents.

V. Classifying data by the direction of the flow the measure regulates (inflows, outflows or undefined)

Policy actions are also classified as inflow, outflow or undefined controls.⁷ Inflow controls are those that affect a country’s external liabilities; while outflow controls are those that affect a country’s external assets. Many policy actions are straightforward to classify as inflow or outflow controls, once one understands the underlying transaction/asset that they relate to. However, there are two special cases where the inflow/outflow control classification is not straightforward: (i) treatment of repatriation requirements and (ii) treatment of currency-based measures and other measures that are not clearly inflow or outflow measures. We treat both in line with the treatment accorded to them in the balance of payment statistics, i.e. we classify them as whether they affect

⁷ The undefined category refers to controls that cannot be clearly allocated to be either inflow or outflow controls and is different from restrictions that simultaneously affect both inflows and outflows. Where an action clearly affects both inflows and outflows, each is counted in its own right as a separate CFM. For example, a change in the regulations on “the use of external borrowing to invest abroad” is counted as an inflow and as an outflow control.

net acquisition of foreign assets by residents (outflows) or a change in residents' liabilities to non-residents (inflows) or could potentially involve both or none (unallocated).

Restrictions on repatriation of proceeds from the sale of foreigners' investments in the domestic economy are counted as inflow controls. Similarly, capital outflow controls include all changes related to the sales of foreign assets by residents. This classification allows us to have a close correspondence between capital controls data and balance of payments data on capital flows, which measure net purchases of domestic assets by non-residents (gross inflows) and the net purchases of foreign assets by residents (gross outflows). Classifying control changes by residency also allows us to recognize that easing repatriation requirements on non-residents can encourage more inflows, as non-residents will be more willing to bring capital in if they are assured of being able to repatriate when desired. Although conceptually important, CFMs related to repatriation represent only a small proportion of the observations in the dataset (only about 38 unweighted changes relate to repatriation requirements).

Currency-based measures include measures that discriminate based on the currency of transaction, not on the residency of transactor, and are often applied to the domestic financial sector. Such measures include reserve requirements on foreign currency deposits and limits on open foreign currency positions of resident banks. Unlike Ostry et al. (2011), we classify the limits on open short positions in foreign currency as inflow controls (as these discourage inflows) and on long positions as outflow controls. However, limits on banks' net open positions in foreign currencies are not classified as being specific to either inflows or outflows. Further, balance of payments statistics do not count transactions in foreign currency between residents nor those in domestic currency between non-residents. Therefore, restrictions that are not explicitly related to transactions between residents and non-residents (for example, changes in reserve requirements on foreign currency deposits or increasing aggregate limit on residents' issuance of onshore foreign currency denominated bonds that could be purchased by both residents and non-residents) are classified as not being specific to inflows or outflows. Out of the 1271 unweighted changes from 2001- 2015, 201 measures are classified as not being specific to inflows or outflows, and of these, 152 are currency-based measures and 49 are capital controls (mostly restrictions on trading of FX derivatives domestically).

VI. *Classifying measures by policy stance (easing or tightening)*

Each CFM is classified as either representing an easing of regulations or a tightening. This information is often not provided in the policy announcements themselves, requiring the availability of the existing regulation prior to the CFM announcement to be able to classify the CFM.

For example, an excerpt from an RBI notification dated 23 November 2011 DBOD.Dir.BC.59/13.03.00/2011-12 entitled “Interest Rates on Non-Resident (External) Rupee (NRE) Deposits and FCNR(B) Deposits” reads as follows:

“1. Interest Rates on Non-Resident (External) Rupee (NRE) Deposits

Please refer to paragraph 1 of our circular DBOD.No.Dir.BC.82/13.03.00/2008-09 dated November 15, 2008 on Interest Rates on Deposits held in Non-Resident (External) Rupee (NRE) Accounts. In view of the prevailing market conditions, it has been decided that until further notice and with effect from close of business in India as on November 23, 2011, the interest rates on Non-Resident (External) Rupee (NRE) Term Deposits will be as under:

Interest rates on fresh Non-Resident (External) Rupee (NRE) Term Deposits for one to three years maturity should not exceed the LIBOR/SWAP rates plus 275 basis points, as on the last working day of the previous month, for US dollar of corresponding maturities (as against LIBOR/SWAP rates plus 175 basis points effective from close of business on November 15, 2008). The interest rates as determined above for three year deposits will also be applicable in case the maturity period exceeds three years. The changes in interest rates will also apply to NRE deposits renewed after their present maturity period.”

The previous interest rate ceiling applicable before this announcement was lower. Therefore, this announcement represents an easing, as it effectively allows banks to attract more non-resident deposits.

Step 2: Drop “Small Changes”

In order to keep changes broadly comparable, we drop the “small changes” from the dataset. We define small changes as follows⁸:

- Limits on capital flows when targeted at specific countries and/or related to sanctions for political reasons (such as restrictions on transactions with Libya or Iran).
- Regulations resulting from specific trade disputes or relatively small changes related to one specific industry with minor importance (for example, FDI in manufacturing of cigarettes and cigars). Our decision whether or not to include a change affecting a specific industry is based on informed judgment taking into account the macroeconomic relevance of that industry and the relative importance of the regulatory change. For example,
 - In India, the existing ceiling on foreign borrowing of USD 100 million was raised to USD 500 million per financial year for borrowers in the infrastructure sector for Rupee expenditure on 22 September 2008. We did not classify this as a small change, as it is a five-fold increase in borrowing limit for a major industry.
 - On 2 March 2010, India expanded the definition of infrastructure sector, for the purpose of availing external borrowing, to include "cold storage or cold room facility, including for farm level pre-cooling, for preservation or storage of agricultural and allied produce, marine products and meat". This would allow certain firms to obtain easier access to foreign borrowing. Given the limited scope of the change, we classified this CFM as a small change and dropped it from the dataset.
 - India has the largest number of CFMs relating to a specific industry and we dropped several of these.
- Minor changes in procedural requirements (for example, change in form/procedures for reporting of transactions or removal of requirements for ex-post confirmation).

⁸ This is similar to the definition of small changes used in Forbes et al. (2012)

- Minor changes affecting non-residents living or travelling abroad or residents travelling abroad (for example, repatriation of assets by emigrants, payments for education or medical expenses abroad, or access to foreign currency for travel) or small value transactions between relatives and friends.
- Changes affecting employees of foreign-owned companies (e.g. grant of stock options or foreign currency loans to resident employees) or certain section of investors (e.g. investment in newly issued units of existing property funds by existing unit holders of such property funds)

In addition to small changes, we drop changes that cover one-off guarantees as these are not included in balance of payments statistics (for example, authorization requirements for guarantees by non-financial juridical persons in credit operations for their foreign subsidiaries). We also drop measures that largely relate to the development of domestic financial markets, for example, those allowing domestic trading of currency futures or measures allowing additional domestic banks to trade currency derivatives.

Step 3: Count the measures and weight them

Each CFM identified by decomposing announcements as discussed under Step 2 above is counted as one change in the unweighted data. To construct the weighted dataset, we weight each CFM by the share of the country's total international assets or liabilities that the measure is designed to influence. For example, a tax on portfolio equity inflows is weighted by the (lagged) share of portfolio equity liabilities in the total international liabilities of the country imposing the tax. A restriction on foreign direct investment by domestic residents (FDI outflows) is weighted by the share of FDI assets in total international assets of the country. A change that influences all asset classes of inflows (or outflows) has the highest weight, i.e. a weight of 1. We use data on the international investment position (IIP) from Lane and Milesi-Ferretti (2017, LMF henceforth) and IMF IIP statistics.⁹ For the limited number of countries for which the LMF data start after 2001,

⁹ The current version of the dataset uses the updated Lane and Milesi-Ferretti dataset for the weights, which is available through 2015. Previous versions of the dataset, including that used in Pasricha et al. (2018) used the older version of the LMF data (Lane and Milesi-Ferretti, 2007), which was only available until 2011. To extend the LMF (2007) data from 2012-2015, the growth rate of the relevant series from IMF IIP statistics was applied to LMF data before computing shares.

the first data point is used for all prior years. If the LMF series is missing for a country, the average value of that series for all EMEs in each year is used. If a change affects more than one category, we add up the weights across the relevant IIP categories.

IIP data are available at an annual frequency. Our dataset on CFMs is daily, which we aggregate into a quarterly dataset. In order to control for endogeneity, the weights are lagged by one year, i.e. CFMs on each day in a calendar year are weighted by the IIP positions as at the end of the previous calendar year.

Table 2 presents the correspondence between the unweighted and weighted data.¹⁰ In addition, in order to increase comparability across CFMs, certain decisions about the counts/weighting were made that merit special mention:

1. Some CFMs related to banks and other deposit institutions apply to transactions that would be covered by different IIP categories. For example, limits on foreign exchange exposure by banks would cover all of banks' assets and liabilities in foreign currency, which could fall under any of the four above IIP categories. Weighting such changes by one (i.e. assuming that they affect all IIP categories) would likely overweight these CFMs, as they only affect flows relating to banks. As bank flows are considered to dominate "other investment" and "derivatives" categories in balance of payment statistics, such CFMs are weighted by the sum of the shares of "other investment" and "financial derivatives" in the external balance sheet.¹¹ They are counted as one change in the unweighted dataset.
2. Similarly, the CFMs related to institutional investors that do not specify which type of investment they apply to, for example, a limit on the institutional investors' total foreign or foreign currency assets are weighted by the sum of portfolio and financial derivatives assets in total external assets. They are counted as one change in the unweighted dataset.

¹⁰ Ideally, we would weight each CFM by the narrowest IIP category available. Some countries provide a breakdown of "Other investment" into "Currency and Deposits", "Loans", "Trade Credit" etc. However, this breakdown is not available in a sufficiently consistent manner across countries and over time. Only the composition of portfolio flows has a panel coverage that is sufficiently detailed.

¹¹ However, where the CFM announcement explicitly specifies which types of bank transactions are covered, we use that information to specify the weights.

3. CFMs that affect all of the IIP categories are counted four times in the unweighted data and assigned the maximum weight of 1 in weighted data. However, when the change is judged to be a major change, especially one that affects financial institutions (as well as non-financial sector) it is counted as five in the unweighted data, giving an additional count.

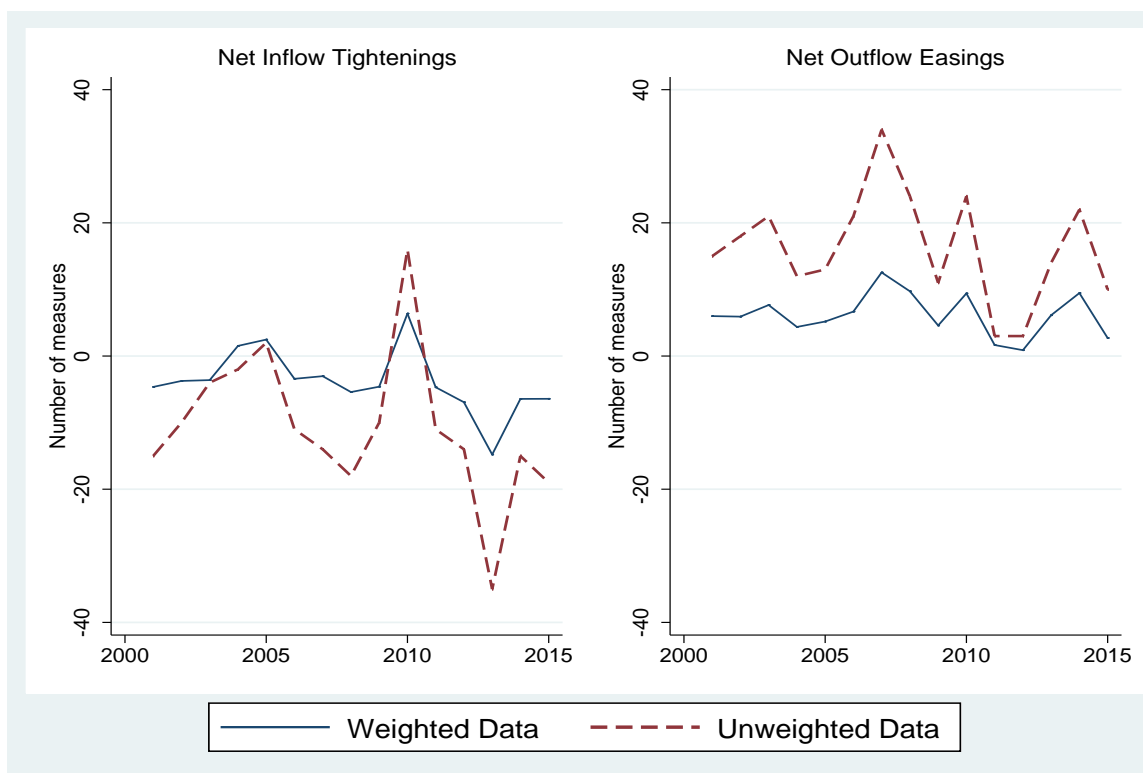
Table 2: Counting changes in weighted and unweighted data

	Code		IIP Category	Weight for inflows (Weighted Data)	Count (Unweighted Data)
1	D		Foreign Direct Investment	FDI Liabilities/Total Liabilities	1
2	O		Other Investment	Other Investment Liabilities/Total Liabilities	1
3	P		Portfolio Investment, of which:	Portfolio Liabilities/Total Liabilities	1
	3.1	PD	Portfolio Debt	Portfolio Debt Liabilities/Total Liabilities	1 if relating to portfolio debt only. 0.5 if combined with a change in portfolio equity on that date.
	3.2	PE	Portfolio Equity	Portfolio Equity Liabilities/Total Liabilities	1 if relating to portfolio equity only. 0.5 if combined with a change in portfolio debt on that date.
4	PDF		Financial Derivatives	Financial Derivatives Liabilities /Total Liabilities	1

Note: Outflow related changes were analogously weighted by share of the relevant IIP category in total external assets of the country (instead of external liabilities).

By design, the weighting scheme puts a low weight on changes related to transactions that are not important for the country's external balance sheet. This scheme changes the values of number of inflow and outflow changes, but the weighted and unweighted series retain the same pattern over time (Figure 1).

Figure 1: Impact of the weighting scheme on net inflow tightening vs. net outflow easing



Note: Net easing of outflow controls is the difference between outflow easing CCAs and outflow tightening CCAs. Net tightening of inflow controls is analogously defined. We exclude measures related to FDI. Although weights are always less than or equal to 1, weighted net measures are not necessarily less than unweighted net measures. For example, the weights associated with inflow tightening measures may be larger than those of inflow easing measures, implying that the weighted net measure is higher than the unweighted net measure.

Step 4: Construct summary measures

In the final step, we construct summary measures that capture the net direction of policy, which can be used for empirical analysis. Our main classification is the following:

1. Net inflow tightening measures: This variable is the number of measures that represent tightening of controls on inflows in a quarter, minus the number of measures that represent easing of inflow controls.

2. Net outflow easing measures: This variable is the number of measures that represent the easing of controls on outflows in a quarter, minus the number of measures that represent tightening of outflow controls in the same quarter.

This specification can be used for a baseline model and these summary measures can be expected to have an intuitive impact on macroeconomic indicators, such as net capital flows.

However, EME policy is often geared towards reducing the pressure of net capital inflows, which are defined as net inflows by non-residents less net outflows by residents during a quarter. Since both outflow easing as well as inflow tightening would tend to reduce the pressure of net capital inflows, we also group the measures into whether they would encourage or discourage net capital inflows, i.e. the difference between inflows and outflows. This gives us the following additional categories:

1. NKI Reducing Measures: These are measures that represent tightening of inflows, easing of outflows or other tightening.

2. NKI Increasing Measures: These are measures that represent easing of inflows, tightening of outflows or other easing.

3. Net NKI Restricting Measures = NKI Reducing Measures - NKI Increasing Measures.

Comparison with existing measures in the literature

There are two types of datasets on capital flow measures: (1) indices that capture the level of capital account restrictions and; (2) those that measure the change in capital account policy. Our dataset falls in the second category – it measures policy actions over time, and thus captures the intensive margin of changes in capital control regimes. While our dataset provides a detailed picture of how capital account regulations change over time, it does not allow a cross-country comparison of the restrictiveness of capital control regimes. Datasets on capital controls typically draw from the IMF's AREAER to varying degrees for the underlying data.

The most commonly used indicators of capital controls that capture the level of capital account restrictions are the indices constructed by Chinn-Ito (2008), Schindler (2009), Fernandez et al. (2015) and Quinn (1997). These indices are available at an annual frequency. While they all capture the degree of restrictiveness of capital account regulations, they complement each other since their focus is somewhat different. While the Chinn-Ito measure is the broadest index available for a relatively large number of countries and years, the Schindler index contains more

granular information and the Quinn index (unlike the other measures) also applies judgement on the intensity of controls, but for a more limited set of countries.

The Chinn-Ito index is the broadest measure of financial openness, covering also restrictions to the current account of the balance of payments and on the foreign exchange market. More specifically, Chinn and Ito (2008) create a composite measure with annual frequency from four dummy variables using a principal component approach. These four binary indicators are: (1) the openness of a country's capital account; (2) the openness of the current account; (3) the stringency of requirements for the repatriation and/or surrender of export proceeds; and (4) the existence of multiple exchange rates for capital account transactions. The Chinn-Ito index is an aggregate indicator, and does not differentiate between inflow and outflow controls, but is available for a relatively large number of countries (182) for a long period (1970-2013).

Schindler's dataset contains disaggregated data (updated and expanded in 2015 by Fernandez et al., 2015) with an annual frequency for 100 countries over the period 1995 to 2013. A key feature of these data is that the information on capital controls is broken down into inflow or outflow controls and further into ten different categories of assets. While the Schindler index is available for a more limited set of countries and a shorter period than the Chinn-Ito index, it adds to existing datasets of capital account restrictions because of its more granular nature. This allows for a more detailed analysis of capital controls, including those relating to different types of assets and inflows versus outflows.

In contrast to the Chinn-Ito and the Schindler index, which use binary variables for the existence of capital controls, Quinn (1997) and Quinn and Toyoda (2008) construct a dataset that applies judgement to capture the intensity of controls and covers 94 countries for the period 1950 to 2012 with annual frequency. The Quinn index assumes that tax or price measures are less restrictive than quantity or other regulatory restrictions. Like the Chinn-Ito index, the Quinn index includes both restrictions on capital account and current account transactions, but it distinguishes between inflow and outflow controls for both categories. It also includes a measure of whether the country has international treaty obligations to liberalize the capital account, stemming, for example, from OECD or EU membership. However, within the capital account, the Quinn index does not provide separate indices by category of assets.

A more recent strand in the literature on datasets for CFMs focuses on changes to capital account regulations instead of levels. These datasets have a higher frequency (typically daily) than the above indices of the level of capital account restrictiveness and therefore provide a more precise picture of changes to capital account restrictions, allowing empirical analysis of the impact of these decisions at shorter horizons.

Our dataset is an update and extension of Pasricha (2012), which presents data on CFMs (both capital controls and currency-based prudential measures) for 21 EMEs based on the IMF's AREAER, regulators' websites, news sources and other research papers. There are two important differences between our dataset and the original Pasricha (2012) dataset: (i) the original dataset followed the AREAER categories, whereas our dataset uses the IIP categories to classify changes in Step 1; and (ii) the Pasricha (2012) dataset is unweighted. Our dataset has a more detailed classification of CFMs than the other datasets, with the exception of Pandey et al (2015), who build an instrument-level dataset on CFMs pertaining to foreign borrowing in India. Our dataset now covers 45 advanced and emerging economies, over the period 1 January 2001 to 31 December 2015 and includes 1271 policy actions.

A similar dataset to ours is the one by Forbes et al (2015), who create a database of CFMs with changes in capital controls and prudential measures from 2009 to 2011 for 60 countries. While this dataset covers a larger group of countries than ours, the sample is substantially shorter (three years after the financial crisis) and contains a somewhat less detailed breakdown of CFMs (i.e. controls on capital inflows, controls on capital outflows and currency-based measures, further broken down into six types of financial assets, and into easing and tightening actions).¹² The dataset includes 220 capital control changes.

A dataset with a short sample similar to Forbes et al is the one by Del Giudice and Wu (2013), who construct a dataset for 12 countries for the period from July 2009 to June 2011. They subsequently decompose these measures into price-based, quantity-based and time-based measures, for both inflows and outflows (i.e. total of six categories). Their dataset has 60 measures.

¹² This dataset does not include a breakdown by price, quantitative or monitoring measures. Also, for announcements that entail both an easing and a tightening of restrictions, the authors apply a judgement as to which change was more important and classify them in the dominant category. In our dataset, we count both changes separately, and weigh them with the respective IIP category.

Two recent datasets focus on inflow controls. Ahmed et al. (2015) construct a dataset for CFMs in 19 countries for 2002-2012. While the country and time coverage of this database is similar to ours, its breakdown into different types of controls is less detailed and includes only information on inflows (equity, bond, banking and FDI inflows). This dataset includes 235 measures. Chantapacdepong and Shim (2014) construct a database on policy actions in twelve emerging Asia-Pacific economies for the period 2004-2013, using data from AREAER and national sources. Their breakdown into easing/tightening and different types of asset classes is available only for inflow controls. They classify inflow controls by asset classes (bond, equity, banking, real estate, direct investment flows and other) and by target group (non-residents or both residents and non-residents). This dataset has 364 policy actions.

References

Abramovich, F.L. and J.I. Mayora (2012) “Foreign exchange controls in Argentina” *International Financial Law Review*, 8 October 2012.

Ahmed, S., Curcuru S.E., Warnock, F.E. and A. Zlate (2015), “The two components of international portfolio flows”, Mimeo.

Aizenman, J. and G.K. Pasricha (2013), “Why do emerging markets liberalize capital outflow controls? Fiscal versus net capital flow concerns”, *Journal of International Money and Finance*, Volume 39, Pages 1-246.

Bruno, V., I. Shim and H.S. Shin (2015), “Comparative assessment of Macroprudential policies”, BIS Working Papers 502, Bank for International Settlements.

Chantapacdepong, P. and I. Shim (2014), “Correlations across Asia-Pacific bond markets and the impact of capital flow measures”, BIS Working Papers, No 472, December 2014.

Chinn, M. D. and H. Ito (2008), “A New Measure of Financial Openness” *Journal of Comparative Policy Analysis*, 10, 3: 309 – 322 (September).

Del Giudice, R. M. and T. Wu (2013), “The effect of capital controls and prudential FX measures on option-implied exchange rate stability” Working Paper Series 2013-20, Federal Reserve Bank of San Francisco.

Fernandez, A., M. W. Klein, A. Rebucci, M. Schindler and M. Uribe (2015), “Capital Control Measures: A New Dataset” NBER Working Papers 20970, National Bureau of Economic Research, Inc.

Forbes, K., M. Fratzscher, T. Kostka and R. Straub (2012), “Bubble They Neighbor: Portfolio Effects and Externalities” ECB Working Paper, No 1456, August 2012.

Forbes, K., M. Fratzscher and R. Straub (2015), “Capital Flow Management Measures: What Are They Good For?” NBER Working Papers 20860, National Bureau of Economic Research, Inc.

Lane, P.R. and G.M. Milesi-Ferretti (2007), “The external wealth of nations mark II: Revised and extended estimates of foreign assets and liabilities, 1970–2004” *Journal of International Economics*, 73, November, 223-250

Lane, P.R. and G.M. Milesi-Ferretti (2017), “International Financial Integration in the Aftermath of the Global Financial Crisis” International Monetary Fund Working Paper No. 17/115, May 10, 2017

Ostry, J.D., A.R. Ghosh, K. Habermeier, L. Laeven, M. Chamon, M. S. Qureshi and A. Kokenyne (2011), “Managing Capital Inflows: What Tools to Use?” IMF Staff Discussion note, 5 April 2011, SDN/11/06.

Pandey, R., G.K. Pasricha, I. Patnaik and A. Shah (2015), “Motivations for capital controls and their effectiveness” Bank of Canada Working Paper No. 2015-5.

Pasricha, G.K. (2012), “Measures to manage capital flows in emerging market economies” *North American Journal of Economics and Finance*, special issue on “International Finance in the aftermath of the 2008 Global Crisis” 23, 3: 286-309.

Quinn, D. (1997), “The Correlates of Changes in International Financial Regulation.” *American Political Science Review* 91 (1997): 531-551.

Quinn, D. and A. M. Toyoda (2008), “Does Capital Account Liberalization Lead to Growth?” *Review of Financial Studies*, 21(3) May 2008: 1403-1449.

Quinn, D., M. Schindler and A. M. Toyoda (2011), “Assessing Measures of Financial Openness and Integration” *IMF Economic Review* 59.3 (2011): 488-522.

Schindler, M. (2009), “Measuring Financial Integration: A New Data Set” *IMF Staff Papers*, Palgrave Macmillan, vol. 56(1), pp 222-238, April.