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IMF Working Paper

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Countries: Evidence from a New Database**

by Sarwat Jahan and Daili Wang

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Strategy, Policy, and Review Department

Capital Account Openness in Low-income Developing Countries: Evidence from a New Database

Prepared by Sarwat Jahan and Daili Wang¹

Authorized for distribution by Rupa Duttagupta

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Abstract

The relevance of recording and assessing countries' capital flow management measures is well-recognized, but very few studies have focused on low-income developing countries (LIDCs). A key constraint is the lack of an appropriate index to measure the openness of capital account and its change over time. This paper fills the gap by constructing a de jure index based on information contained in the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions*. It provides an aggregate index to capture the overall openness of the capital account, and also provides a breakdown of openness for various subcategories of capital flows. The new database covers 164 countries with information on 12 types of asset categories over the period 1996–2013. The index provides the largest coverage of LIDCs among all existing indices and also provides granularity on openness across asset types, direction of flows and residency. The paper examines the link between de jure capital account openness with de facto capital flows and outlines potential applications of this database.

JEL Classification Numbers: C82, F21, F36

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I. INTRODUCTION

Low-income developing countries (LIDCs) have been integrating with the international capital markets, particularly over the last decade. This new integration with international capital markets has resulted in significant cross-border capital flows (Alleyne and Mecagni, 2014; Araujo et. al, 2015a and 2015b). Although increased capital inflows supplement domestic financing of investment, they also pose challenges, raising many key policy questions: for instance, can LIDCs control their international financial market integration? Has the observed increase in LIDCs' integration with global financial markets (or de facto openness) also been accompanied with an increase in their own policies towards opening their capital accounts (or de jure openness)? How can LIDCs best handle the consequences of increased cross-border capital flows? To address these questions, a first challenge is to construct an index of LIDCs' policies towards their capital account openness, which is the main purpose of this paper.

The primary motivation of this paper is to create a comprehensive capital account openness index which can be applied to assess whether there is any association between de jure policies and de facto flows. The creation of a new de jure index (henceforth Wang-Jahan index) was necessary as the existing capital account openness indices in the literature either have limited country coverage particularly on LIDCs, or do not provide adequate information on controls for various categories of capital flows for in-depth analysis.

The Wang-Jahan index aims to close the existing gaps by (a) providing adequate coverage of LIDCs; (b) disaggregating controls on the various categories of capital flows; and (c) producing a longer time-series to show trends and capture recent changes. As with many previous indices, the Wang-Jahan index analyzes the information contained in the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions* (AREAER) and constructs a de jure index for 164 countries, of which 51 are LIDCs, with information on 12 types of asset categories over the period 1996–2013.

This paper finds that LIDCs generally have closed capital accounts but a sub-set of LIDCs, known as the frontier economies, have been catching up to the emerging markets (EMs) in terms of embracing capital account openness. However, there has not been any unique manner through which the LIDCs, including the frontier economies, have been opening up their capital accounts. Some have opened up their capital account in one stroke such as Uganda or Papa New Guinea, others have gradually sequenced the opening up of the capital account in steps such as Ghana. The paper also finds that countries have varying experiences with de facto capital flows when they implemented de jure policies to open up the capital account. Uganda, for example, did not see an immediate impact on de facto capital flows when they opened up the capital account in 1997. Ghana, on the other hand, benefitted from increased capital flows after opening its capital account. More generally the correlation between de facto capital flows and de jure policies towards capital account openness

(or capital flow management measures) is weak, confirming the role of other macroeconomic push and pull factors in influencing capital flows.

The rest of the paper is organized as follows: Section II describes the methodology in constructing the new de jure index and compares it with the existing indices. Section III provides stylized facts about the state of de jure capital account openness in LIDCs. Section IV shows associations between the de jure index and de facto capital flows. Section V concludes and provides guidance on further applications of the index.

II. METHODOLOGY AND COMPARISON

Review of Existing Indices

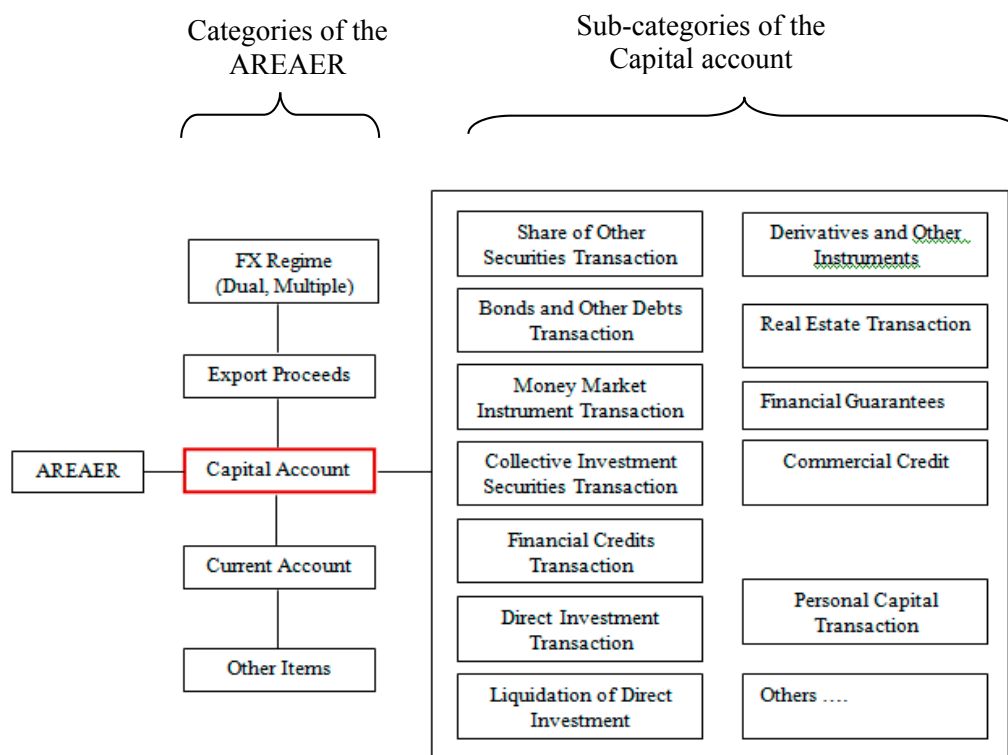
There are several prominent indices on the openness of the capital account, each has its strength but all of them are derived from the information provided on the Fund’s AREAER database. To understand how these indices differ from one another, a careful understanding of the information contained in the AREAER database is necessary. The AREAER database consists of information on several categories for each country (Figure 1). Chinn-Ito combines four of these categories² (FX regime, export proceeds, current account and capital account transaction) to calculate their openness index. In doing so, they capture more than the “strict” openness of the capital account. They justify this procedure by stating that it captures the intensity of the capital controls (since capital controls may be implicitly imposed under entries other than capital account transactions). While Chinn-Ito index has the broadest coverage of countries (182 countries covering 1970–2013), it does not have information on the prevalence of capital controls on specific types of capital flows—for example controls on FDI or the bond market. The index also does not provide information on controls on the direction of flows or based on residency.

To provide deeper insight Schindler (2009) constructed an index that focuses solely on capital account transaction. The AREAER database disaggregates the capital account category into twelve main sub-categories.³ Schindler’s index looks into six of the twelve sub-categories to calculate a composite openness index. Schindler’s index (2009), therefore, has more granularities on the openness of various types of capital. However, Schindler does not include all of the subcategories and he has very limited coverage of LIDCs (15 countries) that prevents any significant analysis of LIDCs as a group. It also has relatively short time coverage (91 countries, covering 1995–2005).

² Four of the categories that are included in the Chin-Ito index are the first four in the “sub-categories of the AREAER” shown in Figure 1. The remaining categories are all classified under “other items”.

³ Prior to 1995, AREAER did not provide detailed information on capital controls in the twelve sub-categories. Therefore, researchers had to rely on a binary dummy variable (1= restricted; 0= liberalized) to gauge the openness of the capital account and further disaggregation by types of capital was not possible.

Figure 1. Layout of Annual Report on Exchange Arrangement and Exchange Restriction



Given the advantages of Schindler’s index, several researchers have expanded his database. Klien (2012) updates Schindler’s index to capture recent changes but limits the country coverage (44 countries over 2006–2010). Fernandez et. al. (2015) have updated and revised Schindler’s index by covering ten categories of assets documented in the AREAER database. Furthermore, they have expanded Schindler’s country coverage by adding nine additional countries over the period 1995–2013 but this index still has limited coverage of LIDCs (19 countries).

The Wang-Jahan openness index (2016) also builds on Schindler’s index by increasing country coverage and adding the missing sub-categories of assets. This de jure index covers 164 countries, of which 51 are LIDCs, with information on 12 types of asset categories over the period 1996–2013(see Annex Table 1 for the country coverage). Although it is very similar to both Schindler (2009) and Fernandez et. al. (2015), there are differences in constructing the index which is discussed in detail in the methodology section.

All the indices discussed above do not have an “intensity” component. Quinn (1997, 2013), on the other hand, constructs a data set that contains information on the intensity of controls by ranking different control instruments by their (assumed) economic importance. We do not adopt this approach, instead our coding rule is to strictly follow the records in the AREAER database. Quinn (1997, 2013) also does not differentiate between capital inflows and outflows as well as different sub-categories of capital.

Methodology:

Capital account transaction category contains twelve main sub-categories (Figure 1; see Annex A for definitions). Information on each of the twelve sub-categories are presented in three columns in AREAER: the first identifies the sub-category; the second reports YES, NO, or no entry (Yes indicates that a restriction is in place); the final column provides a short narrative on the controls. We code on the basis of the information provided in the second column by giving a binary code of 0 for restricted and 1 for fully open based on the answers to the individual questions in each sub-category. We, however, do not completely disregard the information in the third column. We use the information provided in the third column to verify that the YES/NO/No Entry characterization in the second column is indeed correct. It was often necessary to verify the responses in the case of LIDCs. Therefore, we use information in the third column to override the coding in the second column only if there is clear evidence that there was an error in the second column. For example, in some cases the second column reports NO (there are no controls on capital flows in a specific market) but the third column clarifies that there are no controls as that specific market does not exist. In such cases it would be misleading to use the code provided in the second column, and therefore we code based on the information provided in the narrative in the third column instead.⁴ We, however, do not use the information in the third column to form judgment on the intensity on capital controls.

This coding differs from the one adopted by Fernandez et. al. (2015) that mainly assigns a binary code based on the narrative in the third column. Fernandez et. al. (2015) use the coding provided in the second column only if the narrative in the third column is missing. If there is narrative in the third column they code using information in that column based on specific rules.

We believe that the narrative in third column provides useful information but we only use it to understand/verify the coding proved in the second column. We do not make additional judgments based on the narrative on the third column simply because (i) interpreting the narrative is very subjective, for example, if a country places capital controls on only one sector which is large should it receive the same code as another country that places capital controls on more than one small sector. Similarly, should “approval required but frequently granted” receive the same weight as “approval not required but heavily taxed” (see Schindler

⁴ A case in point would be looking at the 2014 AREAER database for Afghanistan where the second column reports that there are no controls on capital market securities but the third column explains that “there are currently no capital market securities transaction”. Therefore, it would be misleading to assess openness solely based on information in the second column without verifying its accuracy based on information in the third column.

2009 for details); and (ii) most countries, particularly LIDCs do not provide a comprehensive narrative to form judgments.⁵

Table 1. Types of Assets in the Capital Account and their Sub-components

ka_eq	Average equity liberalization (1=fully liberalized)
eq_plbn	Purchase locally by nonresidents (equity)
eq_siln	Sale or issue locally by nonresidents (equity)
eq_pabr	Purchase abroad by residents (equity)
eq_siar	Sale or issue abroad by residents (equity)
ka_bo	Average bond liberalization (1=fully liberalized)
bo_plbn	Purchase locally by nonresidents (bond)
bo_siln	Sale or issue locally by nonresidents (bond)
bo_pabr	Purchase abroad by residents (bond)
bo_siar	Sale or issue abroad by residents (bond)
ka_mm	Average money market liberalization (1=fully liberalized)
mm_plbn	Purchase locally by nonresidents (money market)
mm_siln	Sale or issue locally by nonresidents (money market)
mm_pabr	Purchase abroad by residents (money market)
mm_siar	Sale or issue abroad by residents (money market)
ka_ci	Average collective investment liberalization (1=fully liberalized)
ci_plbn	Purchase locally by nonresidents (collective investment)
ci_siln	Sale or issue locally by nonresidents (collective investment)
ci_pabr	Purchase abroad by residents (collective investment)
ci_siar	Sale or issue abroad by residents (collective investment)
ka_dr	Average derivative investment liberalization (1=fully liberalized)
dr_plbn	Purchase locally by nonresidents (derivative investment)
dr_siln	Sale or issue locally by nonresidents (derivative investment)
dr_pabr	Purchase abroad by residents (derivative investment)
dr_siar	Sale or issue abroad by residents (derivative investment)
ka_cc	Average commercial credit liberalization (1=fully liberalized)
cc_in	Commercial credit inflow liberalization
cc_out	Commercial credit outflow liberalization
ka_fc	Average financial credit liberalization (1=fully liberalized)
fc_in	Financial credit inflow liberalization
fc_out	Financial credit outflow liberalization
ka_gu	Average guarantee liberalization (1=fully liberalized)
gu_in	Guarantee inflow liberalization
gu_out	Guarantee outflow liberalization
ka_di	Average direct investment liberalization (1=fully liberalized)
di_in	Direct investment inflow liberalization
di_out	Direct investment outflow liberalization
ka_ldi	Direct investment liquidation liberalization (1=fully liberalized)
ka_ret	Real estate capital transaction liberalization (1=fully liberalized)
ka_pct	Personal capital transaction liberalization (1=fully liberalized)

Note: The blue highlighted rows show the main asset categories. The codes correspond to the ones in the database **Capital Account Openness Index** publicly available at <http://www.imf.org/external/datamapper/index.php>

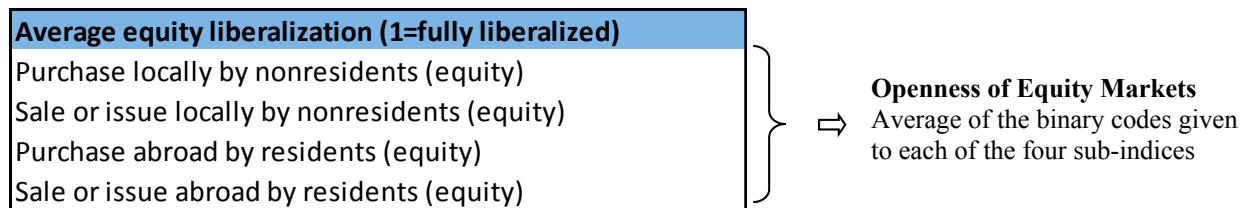
⁵ We do, however, follow Chinn-Ito (2011) and disregard any capital controls placed for political or national security reasons. As Chinn-Ito (2011) points out “international sanctions against terrorist states have made some countries, especially industrialized countries, start reporting implementations of capital controls from 2005 on.” This leads us to modify 98 observations out of 1044 observations after 2005 and affect only 14 high income countries (income per capita above \$10,000 in 2005). Fernandez et. al. (2015) also makes similar adjustments on capital controls placed for political or national security reasons.

For the items under the category of *Equity, Bonds, Money Market Instruments, Collective Investment, and Derivatives and Other Instruments Transaction*, we further disaggregate them into four minor items: *Purchase locally by nonresidents* (Inflow); *Sale or issue locally by nonresidents* (Outflow); *Purchase abroad by residents* (Outflow); *Sale or issue abroad by residents* (Inflow). For the items under the category of *Financial Credit and Direct Investment*, we further disaggregate them into two minor items: *By residents to nonresidents* (outward direct investment); *To residents from nonresidents* (inward direct investment). We do not disaggregate under the remaining three categories: *Liquidation of direct investment; Real estate transactions* and *Personal capital transactions*.^{6,7}

There are a variety of ways to aggregate the subcategories presented in Table 1 to obtain a smaller set of indicators. In particular, the coded data can construct capital control sub-indices by asset category, by residency, and by the direction of flows (inflows vs. outflows).

- **Aggregation by asset category:** The simplest way of aggregating sub- indices, is by taking unweighted averages of the appropriate subcategories.⁸ As *Equity, Bonds, Money Market Instruments, Collective Investment, and Derivatives and Other Instruments Transaction* all have four subcategories and each of their subcategories is coded as a binary variable, asset-specific aggregate openness index can take on five different values (0, 0.25, 0.5, 0.75, and 1). For direct investment and financial credits, where the AREAER provides less disaggregated information on controls, the aggregated index can take on three values (0, 0.5 and 1). Asset categories *Liquidation of direct investment; Real estate transactions* and *Personal capital transactions* can only take on values either 0 or 1 based on our database.

Example: Openness of the Asset Category Equity



- **Aggregation based on the direction of flows:** To indicate controls on inflows and outflows, we do not need any type of aggregation for the asset categories of *Direct*

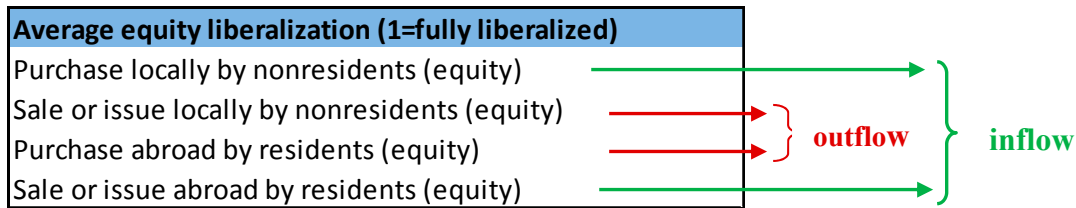
⁶ This is different from Schindler (2009) where inward and outward controls on direct investment as well as the liquidation of direct investment together make up the composite index on direct investment. Fernandez et. al (2015) also differs from our method as he keeps these three categories completely separate.

⁷ Fernandez et. al. (2015) provides more disaggregation on the real estate category.

⁸ An alternative approach was to use principle component analysis. This was done but the index was highly correlated with the one based on simple average. Therefore, we opted to use un-weighted aggregation method.

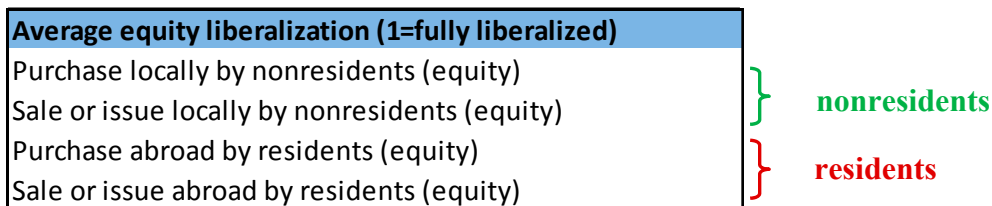
Investment and Financial Credits as the data set only includes their inflow and outflow categories, and the value of each of these indicators will be either 0 or 1. We will also have to exclude *Liquidation of direct investment, Real estate transactions and Personal capital transactions* as these categories do not have disaggregation by inflows and outflows in our database. For the remaining categories, we will have to aggregate *Purchase locally by nonresidents and Sale or issue abroad by residents* to capture inflows, and aggregate *Sale or issue locally by nonresidents and Purchase abroad by residents* to capture outflow.

Example: Openness of Direction of Flows in Equity Markets



- Aggregation based on residency:**⁹ Another option is to identify the openness of the capital account is through transactions by residents or non-residents. For this purpose, we can only use five of the asset categories: *Equity, Bonds, Money Market Instruments, Collective Investment, and Derivatives and Other Instruments Transaction*. For each of these categories, we will have to aggregate *Purchase locally by nonresidents* (Inflow) and *Sale or issue locally by nonresidents* (Outflow) to capture capital account openness for nonresidents. Similarly, we will have to aggregate *Purchase abroad by residents* (Outflow) and *Sale or issue abroad by residents* (Inflow) to capture capital account openness for residents.

Example: Openness of Equity Markets by Residency



It should be noted that the focus of the Wang-Jahan index is to extend the coverage of LIDCs across as many asset types as possible but creating an index for these countries is challenging as they also tend to have the most missing information. Therefore, a conservative approach was adopted when aggregating the index. If any of the twelve asset types had missing information, then the total aggregate index was not calculated (although all individual asset

⁹ Aggregation based on residency is important as the capital flows entry in the balance of payments is based on residency.

types and their sub-categories were reported so that researchers can easily use as the data based on their discretion and available information). We believe this process has kept the index transparent. If a sub-category was missing information under a specific asset type, we tried to fill the gap by being conservative and coding it as “closed” if it did not create sudden jumps in the time series. Missing information is largely an issue that existed in the beginning of the sample period and in fact, all countries have an aggregate index except a few small states (Dominica, Vanuatu, St. Kitts and Nevis, St. Vincent) or if the country is in a fragile situation (examples include Afghanistan, Sudan, Sierra Leone).

The Wang-Jahan index exercises greater caution in terms of aggregating the index than by Fernandez et. al. (2015). This can be illustrated through an example such as Myanmar. Out of the ten asset categories Fernandez et. al. (2015) use in their index, Myanmar does not report information on five asset categories (equity, bonds, money market, collective investment, and derivative investment) over the period 1995–2005. Yet, over this period Fernandez et.al. provides an aggregate index for Myanmar, based on the five asset categories for which there is available information. Providing an aggregate index even when there is substantial missing data is misleading as the aggregate index shows that on average Myanmar had a much more open capital account during the period 1995–2005 compared with the period 2006–2013 when it reported on all categories. Moreover, Fernandez et. al. (2015) aggregate the index based on asset type and direction of flows (inflows vs outflows) but does not aggregate based on residency.

Comparison with other Indices

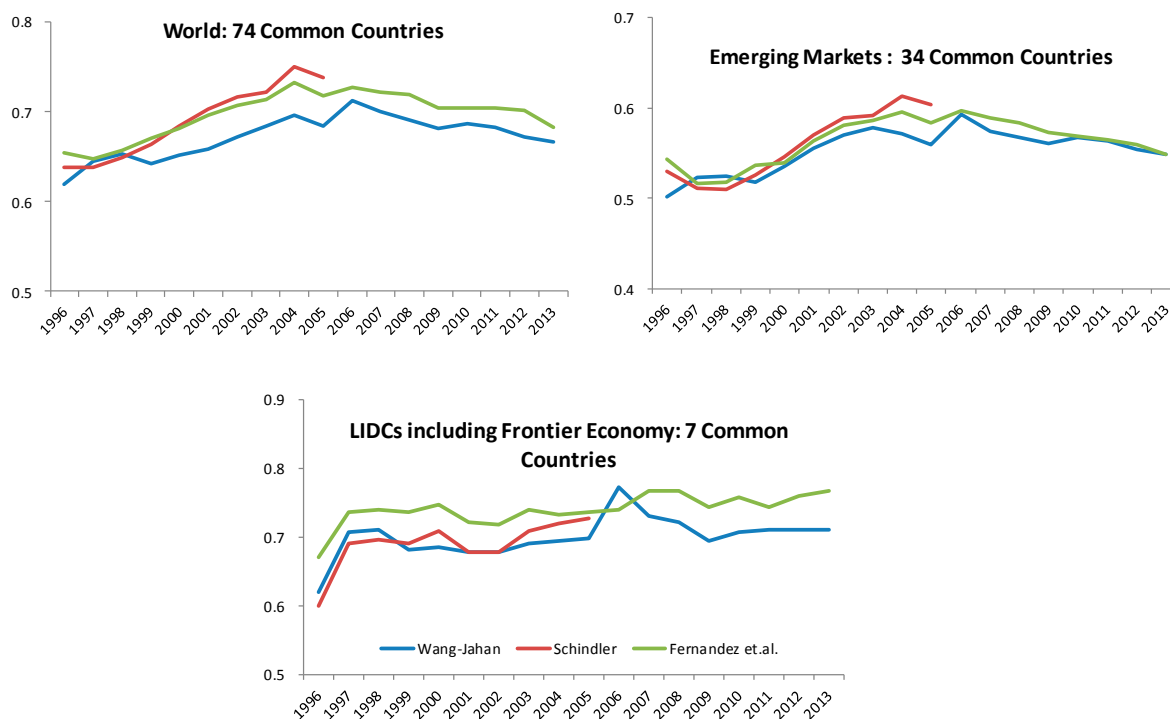
A comparison of the Wang-Jahan index with that of Schindler (2009) and Fernandez et. al. (2015) reveals that the indices are highly correlated (Table 2 and Figure2). This is not surprising as the index is closely related to the methodology developed by Schindler (2009). A correlation of this index with other widely used indices is also shown in Table 2. As expected, it has the highest correlation with Schindler’s index. However, it is also strongly correlated with Chinn-Ito.

Table 2. Correlation of Wang-Jahan Index with Other Capital Account Openness Indices

Country Group	Chinn and Ito (2011)	Schindler (2009)	Quinn (2007)	Fernandez et. al. (2015)
Emerging Markets	0.793	0.942	0.818	0.959
Low-income and developing countries	0.785	0.965	NA	0.950
Frontier Economies	0.834	0.981	NA	0.966

Note: Quinn does not cover any LIDCs or frontier economies

Figure 2. A Comparison of the Indices across Common Countries (mean, balanced sample)



III. STYLIZED FACTS ON DE JURE CAPITAL ACCOUNT OPENNESS

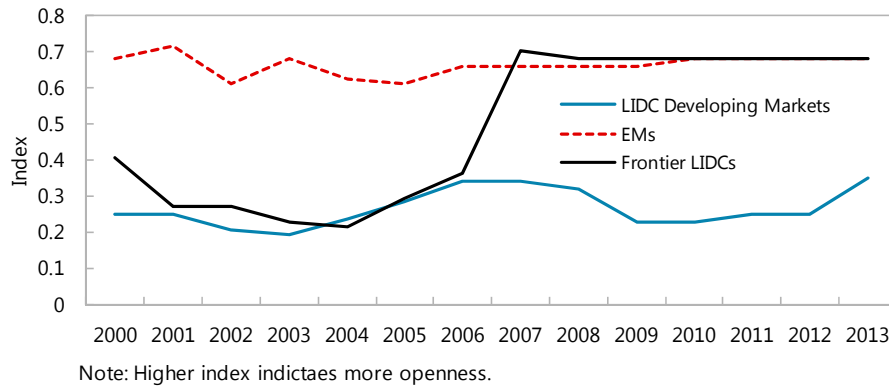
The Wang-Jahan index combines the disaggregated features of Schindler's index with the broad country coverage reflected in Chinn and Ito. This index can, therefore, be used to compare openness across country groups throughout time on various sub-categories of capital account controls. This section discusses a few stylized facts.

A comparison between EMs, LIDCs and Frontier Economies

The aggregate index shows that in general, EMs have more open than capital accounts than LIDCs throughout the sample period (not including LIDCs that are frontier economies). Since 2007, however, the capital account of a sub-set of LIDCs known as frontier economies have been as open as EMs¹⁰ (Figure 3). This result is driven by opening up of the capital account in new frontier economies such as Papa New Guinea and Ghana.

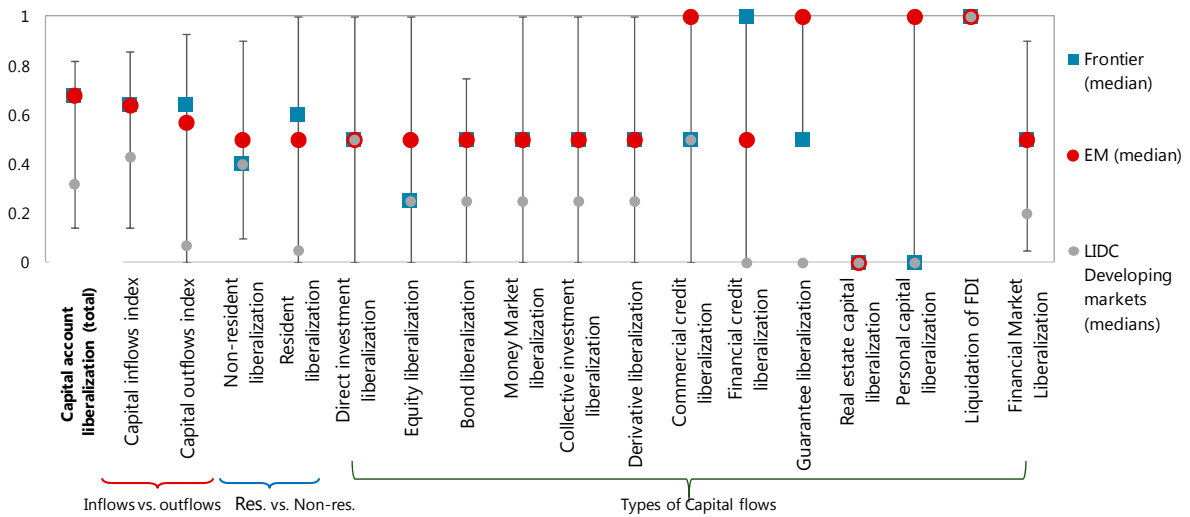
¹⁰ The selection criteria for frontier economies focus on the depth and openness of the financial system and the issuance of sovereign bonds. Each low-income country is benchmarked against emerging markets as follows: (i) it must fall within one standard deviation below the EM average for the following variables: M2 to GDP, cross border loans/deposits, stock market capitalization, and portfolio inflows; and (ii) the country must access sovereign bond markets (or have the potential to access sovereign bond markets proxied by sovereign ratings similar to those that have issued sovereign bonds). See Annex Table 1 for the complete list of frontier economies.

Figure 3. Capital Account Liberalization Index Across Income Groups (Median)



Not surprisingly, disaggregating the index based on the different categories of assets reveals that non-frontier LIDCs are less open than EMs in all types of capital assets except FDI (Figure 4). However, disaggregation of the data also reveals that non-frontier LIDCs are almost as open as EMs in terms of allowing of non-resident flows but are almost closed when it comes to the resident capital flows. Non-frontier LIDCs have far less controls on capital inflows than on capital outflows, where once again they are almost closed (Figure 4).

Figure 4. Capital Account Openness by Subcategories , 2013 (Median)



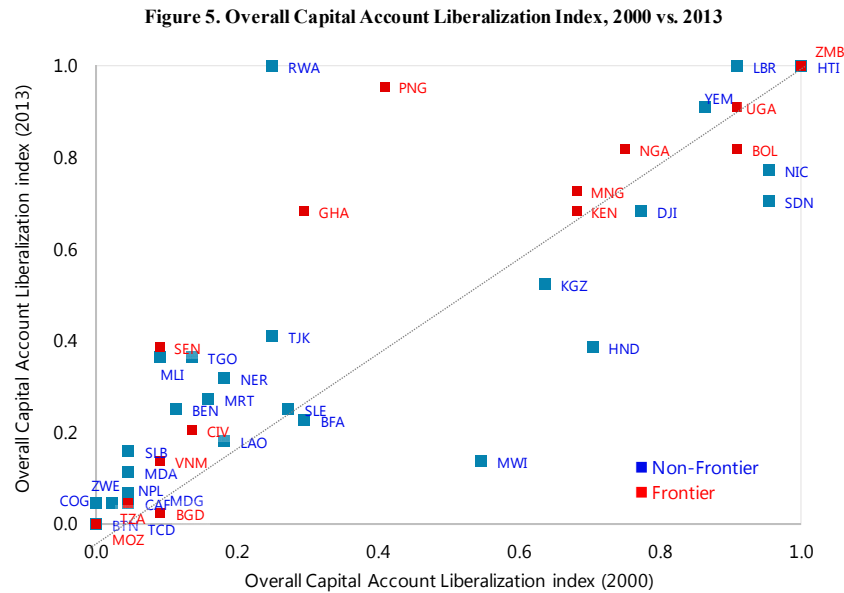
Note: The range shows the top and bottom quartile for frontier economies. Financial market liberalization indicates the average liberalization of equity, bonds, money market, collective investment, and derivatives.

Frontier economies, on the other hand, are as open as emerging economies across various asset types although there is large dispersion. Currently eight out of the total fourteen frontier economies have an index close to 0.7 and above indicating a relatively high level of openness (currently the EM median is close to 0.7). Uganda and Zambia, for example, has been open across almost all asset types since 1997 (see country case study in the next section for details on Uganda). In a stark contrast, Tanzania and Mozambique has been closed in almost all

categories throughout the sample period while both Kenya and Nigeria have modest levels of openness. Ghana was closed until 2005 when it underwent significant liberalization through passing the Foreign Exchange Act. Among the non-African frontier economies, Bolivia has been highly open throughout the sample period with an average of almost 0.9. Frontier economies in Asia are, however, show mixed results. Countries such as Bangladesh and Vietnam are relatively closed, while Mongolia is modestly open. Papua New Guinea has the most open capital account as it completely lifted controls its capital account in 2007 from an almost closed one.

Movement over time

Although frontier economies are the most open among LIDCs, there are a few non-frontier LIDCs that have also made significant progress in opening up their capital account (Figure 5). Rwanda, for example, achieved full capital account liberalization in 2010 with full liberalization taking place within a very short period. Other LIDCs have been taking gradual steps towards opening up the capital account.



Note: The first available data point was used if the country did not have an index in 2000.

Co-movements

The simple pair-wise correlation shown in Table 3 suggests a co-movement or simultaneous liberalization of the various sub-categories in the capital account. The lowest correlation occurs between foreign direct investment and all other sub-categories of the capital account, indicating that the decision to open the economy to foreign direct investment is different from opening up to other types of capital flows. This may be due to the fact that foreign direct investment is often seen as the most beneficial for growth while being the least volatile of capital flows—therefore, it is treated as a separate category.

Table 3. Correlation between Components of Capital Account Liberalization

	Wang-Jahan Index	Fin.Market	Comm.Credit	Fin.Credit	Guarantee	Direct.Inv	Inflow	Outflow	Nonresident	Resident
Wang-Jahan Index	1.00									
Fin.Market	0.94	1.00								
Comm.Credit	0.78	0.66	1.00							
Fin.Credit	0.86	0.77	0.76	1.00						
Guarantee	0.81	0.71	0.75	0.79	1.00					
Direct.Inv	0.74	0.69	0.55	0.61	0.56	1.00				
Inflow							1.00			
Outflow							0.88	1.00		
Nonresident									1.00	
Resident									0.82	1.00

Gates verses Wall.

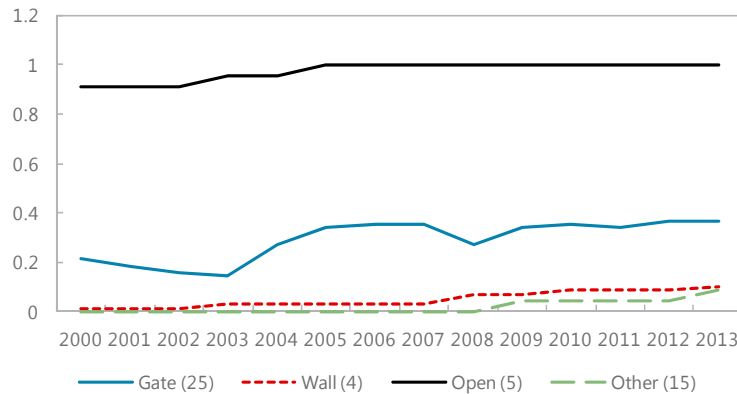
It is also important to make a distinction between countries that have long-standing controls that cover a broad range of assets (walls) such as Bhutan and countries that put in place episodic controls that tend to be imposed on narrower set of assets (gates) such as Nicaragua. This distinction can help understand whether policy changes on capital flows can have a different impact based on their wall/gate classification. For example, countries that are gates tend to keep their capital account open during tranquil periods to benefit from international capital but they close the gates when there are shocks that can create disputation in capital flows. But, countries with

episodic controls (gates) may not be able to fully shut their gates when they impose capital controls because options for evasion may exist when compared to counties that have long-standing controls (see Klein 2012 for details). We adopt Klein's (2012)

classification of a country as *Open*, *Gate* or *Wall*. An *Open* country has virtually no capital

controls on any asset category over the sample period, a *Wall* country has pervasive controls across all, or almost all, categories of assets and a *Gate* country uses capital controls episodically.¹¹ It is not surprising to see that a majority of the countries are Gates. A few selected LIDCs are Open such as Zambia or Wall such as Bhutan. As expected countries that are classified as Gates have a capital account openness index that falls between those that are Open and Walls (text figure). As expected the Gate group has a higher volatility of capital

**Capital Account Liberalization Index for LIDCs
(disaggregated by Gates/Wall/Open)**



¹¹ "Open" ("Walls") countries have, on average, capital controls on less than 10 percent (more than 70 percent) of their transactions subcategories over the sample period and do not have any years in which controls are on more than 20 percent (less than 60 percent) of their transaction subcategories. "Gate" countries are neither Walls nor Open.

account openness than countries that fall into the Open or Wall category. There are several LIDCs that fall into the “other” category as they do not have adequate data to make a conclusive assessment (see Annex Table 2 for a complete list of country classification).

Regional Differences

A regional comparison shows that South Asia (SA) has been the least liberalized region while Latin America and Caribbean (LAC) is the most liberalized region for both LIDCs and EMs (Table 5). However, LIDCs in East Asia and the Pacific, and Latin America and the Caribbean are more open than EMs. While, on average there is not much difference between LIDCs and EMs in sub-Saharan Africa in terms of the de jure capital account openness.

Table 4: Regional Difference in Capital Account Openness (Average of 1996-2013)

Region	Number of countries	Total	Fin. Mark	Res.	Non.Res.	Inflow	Outflow
Low Income Developing Countries							
East Asia & Pacific	5	0.34	0.37	0.28	0.39	0.47	0.28
Eastern Europe & Central Asia	4	0.25	0.12	0.05	0.19	0.17	0.07
Latin America & Caribbean	3	0.78	0.89	0.92	0.86	0.79	0.85
Middle East & North Africa	0	NA	NA	NA	NA	NA	NA
South Asia	2	0.06	0.10	0.12	0.10	0.08	0.11
Sub-Saharan Africa	18	0.40	0.41	0.36	0.44	0.50	0.35
Emerging Markets							
East Asia & Pacific	5	0.25	0.18	0.09	0.29	0.29	0.11
Eastern Europe & Central Asia	19	0.55	0.54	0.51	0.57	0.62	0.49
Latin America & Caribbean	16	0.72	0.69	0.71	0.67	0.71	0.68
Middle East & North Africa	14	0.57	0.59	0.68	0.52	0.60	0.58
South Asia	3	0.13	0.12	0.03	0.20	0.21	0.03
Sub-Saharan Africa	6	0.35	0.31	0.19	0.36	0.42	0.28

Scale	
0 to 0.20	
0.21 to 0.40	
0.41 to 0.60	
0.61 to 0.80	
0.81 to 1.00	

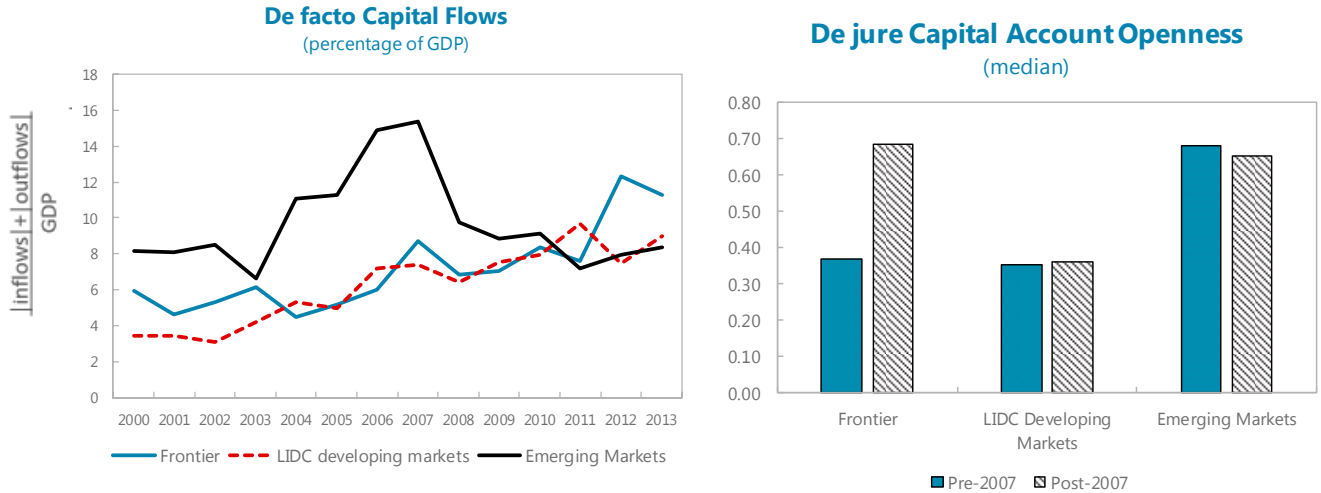
Note:

1. Colors reflect the world quintile of absolute values in each row, with red indicating the quintile with the lowest capital account openness and dark green indicating the quintile with the highest capital account openness.
2. Financial Market indicates average of equity, bonds, money market, collective investment and derivatives.
3. The sample excludes small states and frontier economies.

IV. DE FACTO FLOWS VS DE JURE CAPITAL ACCOUNT OPENNESS

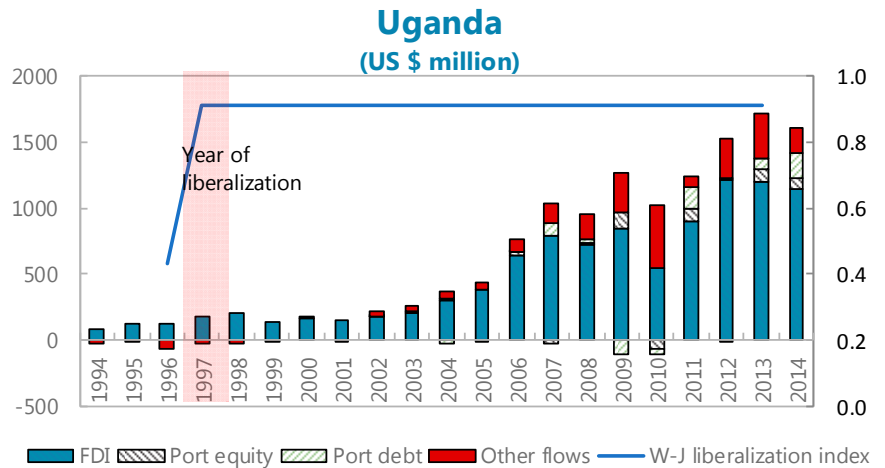
The level of total capital flows to LIDCs has increased in the recent past. But is this increase in de facto integration in any way mimicked by de jure policies? While it is difficult to establish any type of causality based on simple stylized facts, Figure 6 shows that the increase in total capital flows occurred when there was also an increase in opening of the capital account for the frontier economies (by comparing the pre and post 2007 capital flows and index data). Yet, the capital account openness index for other LIDCs and EMs were almost constant but there was an increase in capital flows to LIDCs and a decrease in capital flows to EMs. This illustrates that factors other than policies on capital controls also play a role in capital flows. As simple correlations cannot indicate that there were any conclusive associations between de facto capital flows and de jure capital account openness, it is important to analyze the link between de facto flows and de jure controls with country specific experiences.

Figure 6. De facto Capital Flows and De jure Capital Account Openness



Uganda: Uganda is an illustration of a case where significant opening up of the capital account did not translate into an immediate increase in capital inflows. In July 1997, Uganda liberalized the capital account although the prevailing conditions—a shallow financial sector, limited regulatory capacity etc. were less than ideal.¹² The opening up of the capital account was a part of the second

stage of a broader package of market-oriented reforms. Although the aim of opening up the capital account was to provide incentives to attract private sector savings from external sources, Uganda did not experience an increase in capital flows. In fact, volume of capital flows started to pick up substantially only after 2004. This indicates that opening up of the capital account alone is not sufficient to attract capital flows and other push and pull factors also matter.¹³

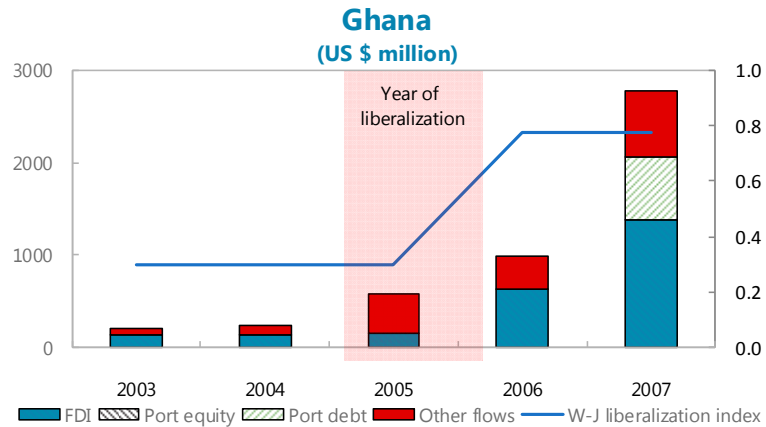


¹² See the case study prepared by Abebe Selassie and Dmitry Gershenson in the Regional Economic Outlook: Sub-Saharan Africa, (April 2008), “Private Capital Flows to sub-Saharan Africa: Financial Globalization’s Final Frontier”, International Monetary Fund, Washington D. C.

¹³ In the case of Uganda, the increase in capital inflows was possible due to the open capital account but it was driven by push factors rather than the pull factors as there were no significant improvements in the quality of institutions, condition of the financial sector, or political developments that could have boosted investor confidence leading to higher capital inflows. The opening of the capital did in the end help purchases of government securities by non-residents (IMF, 2008).

Ghana: Ghana is an example of a case where the country made significant progress in opening up but also kept limited capital account controls. The liberalization began in late 2005 with the Foreign Exchange Act, which allowed for the first time non-residents to purchase domestic bond securities. This

liberalization was a part of a coherent sequencing of policy package which focused on reforms in the debt and stock markets as well as strengthening financial supervision and bank soundness. As a result, Ghana has benefited in terms of increased capital flows, domestic capital market development, and longer-term portfolio inflows.¹⁴



V. CONCLUDING REMARKS

A large and growing literature exists on capital account openness in advanced economies and emerging markets but less (and often fragmented) work has been done on low-income countries. This paper fills this gap by computing and documenting a new database of countries' de jure controls on cross-border financial transactions based on information contained in the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions*. It builds on the methodology adopted by Schindler (2009) albeit with some modifications, which has the advantage of representing the index by disaggregation by types of assets, analyzing openness based on liberalization of inflows or outflows, and whether by residents and non-residents. This paper has expanded the coverage in three ways: time period, asset types and country coverage. In doing so, it covers 164 countries with information on 12 types of asset categories over the period 1996–2013. Given the advantages in adopting Schindler's methodology, several researchers have also updated/expanded his index but the Wang-Jahan index has the most country coverage particularly for low-income developing countries. The paper has also analyzed the link between de jure capital account openness with de facto capital flows.

¹⁴ Another example would be Vietnam where the authorities opened up a specific category in the capital account to attract investors. Historically, Vietnam has been a country with a very limited openness of the capital account (mainly on FDI inflows). In recent years, however, it has taken gradual steps to open up the bond market to attract investment into Vietnam. Currently, there are no restrictions are placed on non-residents and foreigners to purchase local bonds. As a result, the domestic debt market has seen a rapid development and has also provided the government additional financing sources. The equity market in Vietnam has no direct inflow controls although varying degrees of foreign ownership limits apply.

The index created in this paper is disaggregated across various types of capital flow assets, allowing one to use it to assess policy questions across a broad range of issues: for example, assessing the macroeconomic and distributional consequences of de jure capital account openness; analyzing the effectiveness of de jure capital account openness policies in specific assets and liability categories; the relative magnitude of tradeoffs posed by changes in de jure capital account openness (for example between promoting higher investment versus generating additional volatility); and so on. Assessing some of these questions is the purpose of our future research.

Annex Table 1. List of Countries Covered in the Wang-Jahan Database

Table 1. List of Countries Covered in the Wang-Jahan Database					
AMs	EMs	LIDCs	Frontier Markets (Sub-group of LIDCs)	Fragile States (Sub-group of LIDCs)	Small States (Sub-group of EMs & LIDCs)
Australia	Albania	Afganistan	Bangladesh	Afganistan	Antigua
Austria	Algeria	Bangladesh	Bolivia	Burundi	Bahamas
Belgium	Angola	Benin	Cote d'Ivoire	Central African Rep.	Barbados
Canada	Antigua	Bhutan	Ghana	Chad	Belize
Cyprus	Argentina	Bolivia	Kenya	Comoros	Bhutan
Czech Republic	Armenia	Burkina Faso	Mongolia	Congo, DR	Djibouti
Denmark	Azerbaijan	Burundi	Mozambique	Congo, Republic	Dominica
Estonia	Bahamas	Cambodia	Nigeria	Cote d'Ivoire	Fiji
Finland	Bahrain	Central African Rep.	Papua New Guinea	Djibouti	Grenada
France	Barbados	Chad	Senegal	Guinea	Guyana
Germany	Belarus	Comoros	Tanzania	Guinea-Bissau	Maldives
Greece	Belize	Congo, DR	Uganda	Haiti	Mauritius
Hong Kong	Botswana	Congo, Republic	Vietnam	Liberia	Samoa
Iceland	Brazil	Cote d'Ivoire	Zambia	Madagascar	Seychelles
Ireland	Bulgaria	Djibouti		Malawi	St. Kitts and Nevis
Israel	Chile	Ethiopia		Mali	St. Vincent & the Grens.
Italy	China	Gambia		Myanmar	Suriname
Japan	Colombia	Ghana		Sierra Leone	Swaziland
Korea	Costa Rica	Guinea		Solomon Islands	Tonga
Latvia	Croatia	Guinea-Bissau		Sudan	Trinidad and Tobago
Lithuania	Dominica	Haiti		Togo	
Luxembourg	Dominican Republic	Honduras		Yemen	
Malta	Ecuador	Kenya		Zimbabwe	
Netherlands	Egypt	Kyrgyz Republic			
New Zealand	El Salvador	Lao			
Norway	Equatorial Guinea	Liberia			
Portugal	Fiji	Madagascar			
Singapore	Gabon	Malawi			
Slovak Republic	Georgia	Mali			
Slovenia	Grenada	Mauritania			
Spain	Guatemala	Moldova			
Sweden	Guyana	Mongolia			
Switzerland	Hungary	Mozambique			
United Kingdom	India	Myanmar			
United States	Indonesia	Nepal			
	Iran	Nicaragua			
	Iraq*	Niger			
	Jamaica	Nigeria			
	Jordan	Papua New Guinea			
	Kazakhstan	Rwanda			
	Kuwait	Senegal			
	Lebanon	Sierra Leone			
	Macedonia	Solomon Islands			
	Malaysia	Sudan			
	Maldives	Tajikistan			
	Mauritius	Tanzania			
	Mexico	Togo			
	Morocco	Uganda			
	Namibia	Uzbekistan			
	Oman	Vietnam			
	Pakistan	Yemen			
	Panama	Zambia			
	Paraguay	Zimbabwe			
	Peru				
	Philippines				
	Poland				
	Qatar				
	Romania				
	Russia				
	Samoa				
	Saudi Arabia				
	Serbia				
	Seychelles				
	South Africa				
	Sri Lanka				
	St. Kitts and Nevis				
	St. Vincent & the Grens.				
	Suriname				
	Swaziland				
	Syria*				
	Thailand				
	Tonga				
	Trinidad and Tobago				
	Tunisia				
	Turkey				
	Ukraine				
	United Arab Emirates				
	Uruguay				
	Vanuatu				
	Venezuela				
	* Fragile States				

Annex Table 2. Countries Classified as Gate/Walls/Open

GATE		OPEN	WALL	OTHER
Albania	Hungary	Armenia	Bahamas	Algeria
Antigua	Kuwait	Canada	Barbados	Angola
Argentina	Latvia	Costa Rica	Belize	Azerbaijan
Australia	Lebanon	Denmark	Bhutan	Burundi
Austria	Lithuania	El Salvador	Equatorial Guinea	Cambodia
Bahrain	Luxembourg	Greece	Fiji	Central African Republic
Bangladesh	Macedonia	Guatemala	Gabon	Chad
Belarus	Malawi	Guyana	India	Comoros
Belgium	Malaysia	Haiti	Lao	Congo, Republic
Benin	Maldives	Italy	Solomon Islands	Ethiopia
Bolivia	Mali	Japan	Sri Lanka	Iraq
Botswana	Malta	Liberia	Suriname	Kyrgyz Republic
Brazil	Mauritius	Netherlands	Tunisia	Madagascar
Bulgaria	Mexico	Nicaragua	Ukraine	Mauritania
Burkina Faso	Moldova	Panama	Zimbabwe	Myanmar
Chile	Mongolia	Paraguay		Nepal
China	Morocco	Peru		Saint Kitts and Nevis
Colombia	Mozambique	Switzerland		Saint Vincent and the Grenadines
Congo, DR	Namibia	United Kingdom		Serbia
Cote d'Ivoire	New Zealand	Uruguay		Sierra Leone
Croatia	Niger	Yemen		Sudan
Cyprus	Nigeria	Zambia		Syria
Czech Republic	Norway			Vietnam
Djibouti	Oman			
Dominican Republic	Pakistan			
Ecuador	Papua New Guinea			
Egypt	Philippines			
Estonia	Poland			
Finland	Portugal			
France	Qatar			
Georgia	Romania			
Germany	Russia			
Ghana	Rwanda			
Grenada	Samoa			
Guinea	Saudi Arabia			
Guinea-Bissau	Senegal			
Honduras	Seychelles			
Hong Kong	Singapore			
Iceland	Slovak Republic			
Indonesia	Slovenia			
Iran	South Africa			
Ireland	Swaziland			
Israel	Sweden			
Jamaica	Tajikistan			
Jordan	Tanzania			
Kazakhstan	Thailand			
Kenya	Togo			
Korea	Tonga			
Spain	Trinidad and Tobago			
United Arab Emirates	Turkey			
	Uganda			
	United States			
	Uzbekistan			
	Venezuela			

Note: Other denotes those countries that do not have adequate data points over the sample period to make a conclusive assessment.

Annex. Definition of the Asset Types in the Capital Account

The index is based on openness policies on 12 categories of the capital account. For each category a value of 0 (closed) or 1 (open) is assigned based on a country's de jure policy on controls on capital flows. The various categories include:

- **Equity.** Transactions involving shares and other securities of a participating nature, excluding those investments for the purpose of acquiring a lasting economic interest which are addressed as a foreign direct investment.
- **Bond.** Bonds or other debt securities with an original maturity of more than one year. The term other debt securities include notes and debentures.
- **Money market.** Securities with an original maturity of one year or less, including short-term instruments like certificates of deposits and bills of exchange, among others.
- **Collective Investment.** Share certificates and registry entries or other evidence of investor in an institution for collective investment such as mutual funds and investment trusts.
- **Derivatives and other instruments.** Operations in rights, warrants, financial options and futures, secondary market operations in other financial claims (including sovereign loans, receivables, and discounted bills of trade), forward operations, swaps of bonds and other debt securities, and operations in foreign exchange without any other underlying transaction (spot or forward trading on the foreign exchange markets, forward cover operations).
- **Commercial Credit.** Operations directly linked with international trade transactions or with the rendering of international services.
- **Financial Credit.** Credits other than commercial credits granted by all residents, including banks to nonresidents or vice versa.
- **Direct Investment.** Investments for the purpose of establishing lasting economic relations both abroad by residents and domestically by non-residents (for example, for the purpose of producing goods and services, and, to allow investor participation in the management of an enterprise).
- **Direct Investment Liquidation.** The transfer of principal, including the initial capital and capital gains of a foreign direct investment as defined above.
- **Guarantees.** Guarantees, sureties, and financial backup facilities provided by residents to nonresidents and vice versa. It also includes securities pledged for payment or performance of a contract—such as warrants, performance bonds, and standby letters of credit—and financial backup facilities that are credit facilities used as a guarantee for independent financial operations.
- **Real Estate.** The acquisition of real estate not associated with direct investment, including, for example investment of a purely financial nature in real estate or the acquisition of real estate for personal use.
- **Personal capital transaction.** Transfers initiated on behalf of private persons and intended to benefit other private persons. It includes transactions involving property to

which the promise of a return to the owner with payments of interest is attached (e.g., loans or settlements of debt in their country of origin by immigrants) and transfers effected free of charge to the beneficiary (for example, gifts and endowments, loans, inheritances and legacies, and emigrants' assets).

REFERENCES

Alleyne, Trevor and Mauro Mecagni, 2014, *Managing Volatile Capital Flows Experiences and Lessons for Sub-Saharan African Frontier Markets*, (Washington, International Monetary Fund).

Andrés Fernández A., Michael W. Klein, Alessandro Rebucci, Martin Schindler and Martín Uribe, 2015, *Capital Control Measures: A New Dataset*, IMF Working Paper WP/15/80.

Araujo, Juliana, Antonio David, Carlos van Hombecq, and Chris Papageorgiou, (2015a), *Non-FDI Capital Inflows in Low-Income Developing Countries: Catching the Wave?*, IMF Working Paper No. 15/86, (Washington, International Monetary Fund).

_____, (2015b), *Joining the Club? Procyclicality of Private Capital Inflows in Low Income Developing Countries*, IMF Working Paper No. 15/163, (Washington, International Monetary Fund).

Binici, Mahir, Martin Schindler, and Michael Hutchison. 2010. “Controlling Capital? Legal Restrictions and the Asset Composition of International Financial Flows,” *Journal of International Money and Finance* 29:4, 666–684.

Chinn, Menzie D. and Hiro Ito (2006). “What Matters for Financial Development? Capital Controls, Institutions, and Interactions,” *Journal of Development Economics*, Volume 81, Issue 1, Pages 163–192 (October).

_____, (2008), “A New Measure of Financial Openness,” *Journal of Comparative Policy Analysis*, Vol. 10, No. 3, pp. 309–22.

De Gregorio, José, Sebastian Edwards and Rodrigo Valdés. 2000. “Controls on Capital Inflows: Do They Work?” *Journal of Development Economics*, vol. 69, pp. 59 – 83.

International Monetary Fund (IMF), 2013, *Balance of Payments Manual* (Washington, International Monetary Fund, 6th ed.).

_____, various years, *Annual Report on Exchange Arrangements and Exchange Restrictions* (Washington, International Monetary Fund).

_____, 2008, *Regional Economic Outlook: Sub-Saharan Africa*, “Private Capital Flows to sub-Saharan Africa: Financial Globalization’s Final Frontier”, (International Monetary Fund, Washington D.C.), April.

Managing Capital Inflows – Cross-Cutting Themes and Possible Policy Framework.” (Washington, International Monetary Fund).

Jeanne, Olivier. 2012. “Capital Flow Management.” *American Economic Review Papers and Proceedings* (May): 203–06.

Jeanne, Olivier, Arvind Subramanian, and John Williamson. 2012. *Who Needs to Open the Capital Account?* Peterson Institute for International Economics.

Klein, Michael W., (2012), “Capital Controls: Gates versus Walls”, *Brookings Papers on Economic Activity*, 2013, vol. 2, Fall.

Kose, Ayhan, Eswar Prasad, Kenneth Rogoff, and Shang-Jin Wei, 2006, “Financial Globalization: A Reappraisal,” IMF Working Paper 06/189 (Washington, International Monetary Fund).

Laeven, Luc and Fabian Valencia, 2008, “Systemic Banking Crises: A New Database,” IMF Working Paper No. 08/224.

Laeven, Luc and Fabian Valencia, 2010, “Resolution of Banking Crises: The Good, the Bad, and the Ugly,” IMF Working Paper No. 10/44.

Lane, Philip R., and Gian Maria Milesi-Ferretti, 2007, “The External Wealth of Nations Mark II: Revised and Extended Estimates of Foreign Assets and Liabilities,” *Journal of International Economics*, Vol. 73, No. 2, pp. 223–50.

Ostry, Jonathan, Atish Ghosh, Karl Habermeier, Marcos Chamon, Mahvash S. Qureshi, and Dennis B.S. Reinhardt. 2010. “Capital Inflows: The Role of Controls.” *IMF Staff Position Note*, SPN/10/04.

Ostry, Jonathan, Atish Ghosh, Marcos Chamon, and Mahvash S. Qureshi. 2011. “Capital Controls: When and Why.” *IMF Economic Review* 59, no. 3.

Prati, Alessandro, Martin Schindler, and Patricio Valenzuela. 2012. “Who Benefits from Capital Account Liberalization? Evidence from Firm-Level Credit Ratings Data,” *Journal of International Money and Finance* 31:6, 1649–1673.

Quinn, Dennis P., 1997, “The Correlates of Change in International Financial Regulation,” *American Political Science Review*, Vol. 91 (September), pp. 531–51.

Quinn, Dennis, Martin Schindler and A. Maria Toyoda. 2011. “Assessing Measures of Financial Openness and Integration.” *IMF Economic Review* 59, no. 3.

Schindler, Martin. 2009. "Measuring Financial Integration: A New Data Set." *IMF Staff Papers* 56, no 1: 222–38.