IMF's Structural Reform Database

I. Introduction

Structural policies have become a key policy agenda item across many countries amid the concerns on weak economic growth under limited policy space. In many countries including both advanced and developing economies, medium-term growth prospects have been moderating in these years. With limited policy space for traditional macroeconomic policies, policymakers have been exploring ways to promote durable and inclusive growth, including the reforms of structural policies. The IMF is also stepping up its analysis of macrostructural issues following a call by its membership.

To better inform policy making in macrostructural issues, there have been continuous efforts to compile datasets on structural policies. The existing databases typically focus on a certain policy area, with samples tilted toward higher-income economies, reflecting diversity of structural policies and information availability. Yet, a comprehensive dataset is needed to examine the consequences of structural polices under different country-specific circumstances, including the stage of development. Also, appropriate sequencing of various structural reforms needs information across policy areas.

Along these efforts, the IMF's Structural Reform Database (SRD) is compiled to provide a comprehensive set of indicators on structural policies. The IMF's SRD covers a wide range of structural policy areas, over a long-time horizon of about 40 years. It also covers countries with various development levels, for better benchmarking and tailored decision making. The indicators in the SRD measure the degree of regulatory stance in five broad policy areas, with granular sub-indicators. An episode of major structural reforms can be identified by a large increase in the indicators. Alesina et al. (2020) use the SRD to analyze the political economy aspects of structural reforms.

This document provides a detailed account on the IMF's SRD. Section II provides an overview of the SRD. Section III presents a structured data documentation for each structural policy area.

II. Overview of the Database

The SRD provides the indexes that reflect the degree of regulatory stance in several policy areas across countries. The level of the indexes indicates the position of the regulatory system between the open/liberal and closed/conservative stances. An increase in the indexes indicates a structural reform and a decrease indicates a reform reversal. It covers the following sectors:

A. Openness to trade
B. Openness to external finance
C. Domestic finance regulation
D. Product market regulation
E. Labor market regulation

The dataset is the most comprehensive to date not only in terms of country-time coverage, but also for the breadth of the sectoral areas considered. The dataset most comparable to ours is Ostry et al. (2009). Compared to Ostry et al. (2009), our dataset has a larger country coverage; it covers the post crisis period; it includes additional areas of regulation (e.g., on the labor market); and it provides more granular information regarding the regulatory stance of some sectors (e.g., it provide a decomposition of capital account openness in several sub-categories: FDI, portfolio equity investment, bonds and other debt securities, money market instrument and financial credits). Another related cross-country dataset is the one by Duval et al. (2018), who take a narrative approach to identify major reforms on the labor and product markets for 26 advanced economies, while our dataset covers more areas of regulation and a larger set of countries.

The indicators of regulation constructed cover both the realm of the "financial sector" and the "real sector". Financial sector indicators pertain to domestic financial markets—including banking and securities markets—as well as external capital accounts. Real sector structural indicators include measures of trade (average tariff rates, current account), product markets (telecommunications and electricity markets) and labor market (employment protection legislation for indefinite contracts). All indicators are scaled to vary between zero and unity, with higher values representing greater liberalization. Differences in the values of each indicator across countries and over time provide information on the variation in the absolute degree of economic reform within each sector. However, indices are not strictly comparable across sectors, so a higher value of, say, the trade index than the domestic finance index does not imply that an economy is "more liberal" with respect to international trade than domestic finance.

The database covers a sample of 90 countries over the period 1973-2014 (Table 1). In terms of levels of economic development, the dataset covers 26 advanced economies (AEs), 45 emerging markets (EMs), and 19 low-income countries (LICs), based on the classification of the IMF's World Economic Outlook. Of the 90 economies in the dataset, 17 are from Asia and Pacific, 29 are from Europe, 11 are from Middle East and Central Asia, 14 are from sub-Saharan Africa, and the rest of the 19 economies are from Western Hemisphere. As noted in the following sections, there are some differences in data coverage across policy areas. For example, the indicators of capital and current accounts are available for 126 countries from 1950 (or independence) to 2014. A summary of data coverage by policy area is provided in Table 2.

The database can provide the information on major structural reforms (or reversals), where the changes in the indexes are large. As a demonstration, Table 3 presents a brief summary of major structural reforms/reversals. A major reform event is first defined by the annual changes in the indexes exceeding the two standard deviations of the changes over the full sample (Table 3, panel 1). During the sample period, major structural reforms were more often observed than major reform reversals, although labor market regulations rather experienced major reversals more often. Major reforms in domestic finance regulations occurred the most often across policy areas. The pattern is similar even if the standard deviations are calculated over the non-AE sample, suggesting that the standard deviations of changes are not particularly different in EMs and LICs than in AEs (Table 3, panel 2). Alternatively, defining a major reform/reversal by those exceeding the 75th percentile of the absolute annual changes reveals that some indexes do not change often (Table 3, panel 3). For the external finance, product market, and labor market indexes, the 75th percentile is zero. Indeed, for these three sectors, almost 90 percent of observations show zero changes.

III. Structural Reform Datasets by Sector

A. Trade

Definition

The aggregate index of trade openness (*trade*) is the simple average of an aggregated index on tariff rates (*trade_tariff*) and an aggregated index on current account transactions (*trade_ca*):

- *Aggregate tariff index (trade_tariff)*. It provides the simple average tariff rates across products.

- *Aggregate current account restriction index (trade_ca)*. It quantifies the degree of government restrictions on the payments for external trade.

The aggregated index on current account restriction is a simple average of the four sub-indicators as follows:

- *Restrictions on payments for imports of goods (trade_ca_mg)*. It quantifies the degree of government restrictions on the payments for imports of goods.

- *Restrictions on payments for imports of services (trade_ca_ms)*. It quantifies the degree of government restrictions on the payments for imports of services.

- *Restrictions on receipts from exports of goods (trade_ca_xg)*. It quantifies the degree of government restrictions on the proceeds from exports of goods.

- *Restrictions on receipts from exports of services (trade_ca_xs)*. It quantifies the degree of government restrictions on the proceeds from exports of services.

The aggregate index of trade openness is normalized to take values between zero and one.

Data sources

On the tariff rate data, the main sources are the World Integrated Trade Solution (WITS) and World Development Indicators (WDI), covering data from 1988 to 2014. Other data sources include: (i) the World Trade Organization (WTO) for the period 1993-2014; (ii) The General Agreement on Tariffs and Trade (GATT), for the period 1978-1987; and (iii) the Brussels Customs Union database (BTN), for the period 1966-1995.

On the restrictions on current account transactions, data sources are Quinn (1997) and Quinn and Toyoda (2008), based on the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions* (AREAER).

Coverage

Although the base coverage is from 1973 to 2014 for 90 countries, there are missing values if historical data are not available.

How to construct the indicators

The indicator on tariff rates aggregates product-level tariff data by calculating the simple average. The average is normalized between zero (close to trade) and 1 (fully open to trade), where zero means that the tariff rates are 60 percent or higher and 1 means that the tariff rates are zero.

On the indicators for current account restrictions, we extend the database of Quinn and Toyoda (2008) to 126 countries from 1950 (or independence) to 2014.[1] These *de jure* indicators are based on the laws and regulations described in the IMF's AREAER that reports the laws governing the proceeds of transactions and the underlying transactions themselves. The AREAER contains information about policy based on six categories: payment for imports; receipts from exports; payment for invisibles; receipts from invisibles; capital flows by residents; and capital flows by non-residents. We consider restrictions on exchange payments (imports, invisibles) and on exchange receipts (exports, invisibles). Regarding how to aggregate sub-indicators, see the corresponding explanations in Section B.

Descriptive statistics

Table 4 presents summary statics of the tariff indicator and its alternative based on the average weighted by the export share of each product.

Figure 1 presents the average evolution of the composite tariff indicators over the period 1973-2014. The degree of trade openness has improved dramatically over the past 42 years, with the average (weighted average) index steadily increasing from roughly 0.4 (0.6) in year 1973 to 0.9 in 2014.

Figure 2 presents the evolution of the (simple average) tariff indicator across income groups (AEs, EMs, LICs). AEs are on average more open than EMs and LICs and have been (almost) fully open since the early 1990s. Interestingly, while EMs and LICs had a similar level of openness until the 1990s, liberalization has increased faster in EMs than in LICs since then. Looking at the evolution of the indicator across regions it shows that European economies are those more open to trade, while sub-Saharan Africa are those with the highest restrictions (Figure 3).

Figure 4 and Table 5 provide the distribution of the policy changes. Liberalizing and major liberalizing reforms respectively constitute about 3 and 28 percent of observations in the sample, suggesting that policy changes have been usually large. Major reforms have taken place in the 1970s and 1980s, while gradual reforms have typically occurred in the last three decades. Interestingly, gradual tightening reforms have been frequent, while major tightening reforms have been rare events.

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[1] The underlying project on the data extension and decomposition is joint work with Haillie Lee, Amy Pond, and A. Maria Toyoda.

Regarding current account restrictions, see the descriptive statistics in Section B.

Case studies

Figure 5 presents the evolution of trade openness for Cameroon, Korea, and Tunisia.

Cameroon had relatively open current accounts and low tariffs until the mid-1990s. However, the average tariff rates increased in 1994, when there was a one-off devaluation of the CFA Franc by 50 percent, followed by more restrictions on export transactions in 1997. Cameroon's trade openness remains at similar levels since then.

Korea has made substantial progress in liberalizing trade, reflected by relative high values of the tariff sub-indicator. The main index moving from 0.30 to 0.95—from a relatively restricted market to a highly liberalized market. The indicator of current account openness captures the current account liberalizations adopted in the late 1990s following the Asian financial crisis and a program engagement with the IMF.

While tariff rates were low in Tunisia in the 1970s, they were increased during the 1980s. The tariffs have been steadily decreased since 1998, when the Association Agreement with the European Union entered into force. This trend is also reflected in current account openness.

Comparison with other databases

The WDI has some tariff indexes that provide summarized tariff information across countries, which constitutes part of the underlying data of our database. For the WDI, World Bank staff estimates the simple and weighted averages of the applied tariff rates of all products, using the WITS system, based on data from United Nations Conference on Trade and Development's Trade Analysis and Information System (TRAINS) database, the WTO's Integrated Data Base (IDB), and Consolidated Tariff Schedules (CTS) database.

The main differences compared to our database are data coverage and measurement. Our database covers more country-years taken from complementary databases. It also calculates the trade liberalization index, based on not only the tariff rates but also other current account restrictions, and provide a more comprehensive comparison across countries on trade openness.

Regarding current account restrictions, see the comparison with other databases in Section B, where we present the comparison with the databases based on the AREAER.

B. External Finance

Definition

The aggregate index of external finance (*extfin*) is a composite of an index on capital outflow restrictions (*extfin_out*) and an index on capital inflow restrictions (*extfin_in*):

- *Aggregate capital outflow restriction index (extfin_out).* It quantifies the degree of government restrictions on exchange payments of capital outflows.

- *Aggregate current account restriction index (extfin_in)*. It quantifies the degree of government restrictions on exchange payments of capital inflows.

We aggregate the two sub-indicators by their sum, normalizing it between zero and one. There are also five further sub-indicators by type of financial flows for the outflow and inflow restrictions, respectively, as follows:

Outflow restrictions

- *Restrictions on Foreign Direct Investment (FDI) outflows (extfin_out_fdi)*. It quantifies the degree of government restrictions on exchange payments of capital classified as FDI outflows.

- *Restrictions on portfolio equity outflows (extfin_out_pfeq)*. It quantifies the degree of government restrictions on exchange payments of capital classified as portfolio equity outflows.

- *Restrictions on outflows of bonds (extfin_out_bond)*. It quantifies the degree of government restrictions on exchange payments of capital through transactions of bonds or other debt securities.

- *Restrictions on outflows of money market instruments* (*extfin_out_mmi)*. It quantifies the degree of government restrictions on exchange payments of capital through transactions of money market instruments.

- *Restrictions on outflows of bank credit (extfin_out_bank)*. It quantifies the degree of government restrictions on exchange payments of capital through financial credits.

Inflow restrictions

- *Restrictions on FDI inflows (extfin_in_fdi)*. It quantifies the degree of government restrictions on exchange receipts of capital classified as FDI inflows.

- *Restrictions on portfolio equity inflows (extfin_in_pfeq)*. It quantifies the degree of government restrictions on exchange receipts of capital classified as portfolio equity inflows.

- *Restrictions on inflows of bonds (extfin_in_bond)*. It quantifies the degree of government restrictions on exchange receipts of capital through transactions of bonds or other debt securities.

- *Restrictions on inflows of money market instruments (extfin_in_mmi)*. It quantifies the degree of government restrictions on exchange receipts of capital through transactions of money market instruments.

- *Restrictions on inflows of bank credit (extfin_in_bank)*. It quantifies the degree of government restrictions on exchange receipts of capital through financial credits.

These sub-indicators by type of financial flows are not used to create the overall inflow and outflow indicators (*extfin_out* and *extfin_out*), which are coded seperately, because these five sub-categories are not exhaustive (see footnote 4 below).

Data sources

The data sources are Quinn (1997) and Quinn and Toyoda (2008), based on the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions* (AREAER).

Coverage

Although the base coverage is from 1973 to 2014 for 90 countries, there are missing values if historical data are not available.

How to construct the indicators

The construction of the structural reform indicator for capital account follows the approach used in Quinn (1997) and Quinn and Toyoda (2008). We extend the database of Quinn and Toyoda (2008) to 126 countries from 1973 (or independence) to 2014.[2] In addition, we also construct sub-indicators for 60 countries from 1980 to 2014. These *de jure* indicators are based on the laws and regulations described in the IMF's AREAER that reports the laws governing the proceeds of transactions and the underlying transactions themselves. The AREAER contains information about policy based on six categories: payment for imports; receipts from exports; payment for invisibles; receipts from invisibles; capital flows by residents; and capital flows by non-residents. Since the 1980s, the text of the AREAER has contained enough information to distinguish further between and among components of the capital account.[3]

We consider restrictions on exchange payments of capital and on exchange receipts of capital for "representative agents." In the development of new sub-indicators, capital account transactions are broken down into five sub-categories: FDI; portfolio equity investment; bonds and other debt securities; money market instruments; and financial credits. For each category, resident and non-resident transactions are distinguished. Residency is given by the 'preponderance of economic interests' of the agent. Other components of the capital account are available but are not coded.[4]

[2] This underlying project on the capital account extension and decomposition is joint work with Haillie Lee, Amy Pond, and A. Maria Toyoda.

[3] A key concept in AREAER is the distinction between residents and nonresidents, which implies the direction of flows. An outward movement occurs when a resident either pays for goods or services from abroad or acquires an external capital asset in return for cash. Conversely, an inward flow occurs when a nonresident pays for goods, services, or capital assets domestically. Another important distinction is between capital account transactions and financial current account transactions. The former is defined as international transfers of ownership of financial assets, and the latter are all other transactions.

[4] We did not use restrictions on real estate, personal capital transactions, and commercial credits.

In creating the various sub-indicators, we follow the text of the IMF (1950, pp. 4-13) in defining the components of the capital accounts examined. Arrow (1973) provides the regulatory taxonomy on the economic consequences of types of regulation on which our scoring is based. From Arrow (1973), we define the regulation of international transactions (for example, administrative rules and quantitative restrictions) as being more restrictive from an economic viewpoint than is taxation (e.g., multiple currency practices or exchange rate taxes) of these transactions.[5] The coding scheme is described in detail in Quinn (1997). The sub-indicators do not exactly sum to the overall capital account indicator because, as noted in footnote 4, not all of the components of the capital account have been scored.

Descriptive statistics

Table 5 provides the basic summary statistics for the sub-indices of external financial liberalization. Each sub-index takes four values ranging from 0.5 to 2 (0, .5, 1, 1.5, 2), where a higher value implies a higher degree of liberalization. Over the entire sample, restrictions on exchange payments (imports) tend to be lower than those on exchange receipts (exports).

Table 6 presents the correlation matrix among sub-indices for both levels and annual changes. Most of the indicators are highly correlated, suggesting that countries with lower regulation in one area tend to have also lower regulation in other areas (Panel A). In addition, the correlation for changes in the indicators are also positive and sizeable suggesting that liberalization has occurred at the same times across different dimensions (Panel B).

Figure 6 presents the average evolution of the composite indicators of capital and current account over the period 1950-2014. The two series move in rough parallel, though in recent year, the global tendency has been to have more open financial current accounts. Two periods of liberalization are evident, the 1950s and the 1990s. The period between 1965 and 1985 was characterized by a retrenchment in both series. The most recent years are characterized by relative policy stability.

Figure 7 presents the evolution of the capital and current account indicators across income groups (AEs, EMs, LICs) over the past 40 years. For all groups the pace of liberalization has increased around the mid-1990s, with AEs having now almost full open current and financial account. Interestingly, while EMs and LICs had a similar level of regulation until the 1990s, liberalization has increased faster in EMs than LICs since then. Moreover, there seems to have been a reversal in both current and financial account openness since the GFC in some LICs.

Figure 8 reports the evolution of the indicator across regions. Again, for all regions, the pace of liberalization has increased around the mid-1990s. Interestingly, Latina American countries were the most open until the early 1990s, but since then their liberalization process has moved slower compared to other regions. By end of 2014, European Economies are those with highest degree of liberalization, while Sub-Saharan countries are those with the lowest.

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[5] In the instance where the text makes clear that taxation is for confiscation purposes, taxation is accounted as a form of regulation.

Figure 9 shows the trends in the main subcomponents of *capital account*. For space reason, we focus on three of the five new capital account components, including inflow and outflow measures. These are FDI, portfolio equity investment, and financial credits. Starting with FDI (Panel A), while AEs are more open on average than EMDEs (that is, EMs and LICs), they both show more restrictions on inward flows than outward flows. In particular, many EMDEs, while maintaining restrictions on inward investment, have liberalized in recent years FDI outflows. Openness in inward and outward portfolio equity flows and financial credits is very similar in AEs, while EMDEs have laxer regulatory restrictions for inflows than outflows (Panel B and C).

Figure 10 and Table 7 provide the distribution of the policy changes of current and capital account over the past forty years. For current (capital) account, liberalizing reforms and large liberalizing reforms respectively constitute about 10 (5) and 3 (2) percent of observations in the sample, and they have occurred mostly in the 1990s. Tightening reforms and major tightening reforms have been more rare events, with the vast majority of observations characterized by no policy changes (82 percent for current account and 91 percent for capital account).

Case studies

We use two case studies, Brazil and India, to compare the evolution of capital account policies (Figure 11). The countries capture several illustrative experiences of large EMs with recent liberalization experiences, including divergent treatments of differing components of the capital account.

Brazil was relatively closed during the 1950s and 1960s. Brazil remained so through to the early 1990s, a period which saw the growing disaffection with the results of the "import substitution industrialization" model Brazil had implemented. Brazilian liberalization of capital accounts in the late 1990s saw substantial divergence in treatment of types of capital account transactions, with the Brazilian government seeking to limit especially nonresident borrowing in Brazil. Resident borrowing abroad, in contrast, was relatively quickly liberalized in the period before the financial crisis, only to retreat post-crisis. FDI in and out of Brazil, in contrast to financial credits and bank loan transactions, has been treated relatively symmetrically, with both types of transactions relatively open.

India, as with Brazil, was a relatively restrictive economy to most types of capital account transactions until the early 2000s, despite some episodic (and subsequently reversed) liberalizations. In recent years, the Indian government relatively symmetrically liberalized most types of transaction for both residents and nonresidents, though the data through 2014 continue to show extensive restrictions on inward FDI, many of which were subsequently liberalized. Most countries in the data, as with India but unlike Brazil, have relative symmetry across types of capital account restrictions and investors.

Comparison with other databases

We review and compare our work to two other standard measures, KA by Schindler (2009) and KAOPEN by Chinn and Ito (2006, 2008).

Schindler (2009) constructed an indicator denoted by KA based on information in a subset of the categories contained in the new AREAER structure, covering 91 countries during 1995-2005. This has recently been extended in Fernandez et al. (2016). In this dataset, indices are coded in binary form at the basic level of individual types of transactions, such as "issue locally by nonresidents of debt securities" or "sale abroad by residents of equity." This coding was done based on the textual information in each of the covered categories. Aggregating the codes over different subsets of transaction types allows for the construction of indices by asset category, residency status, and inflows versus outflows. We also compare out sub-indicators to KAI (inflows), KAO (outflows), and DII (direct investment inflows). Other comparisons are omitted to save space.

Another widely used measure is the indicator denoted by KAOPEN, constructed by Chinn and Ito (2006, 2008) using the AREAER table to identify an "extensive" indicator of financial globalization, with data reduction technique. That is, in contrast to CAPITAL and its components (by Quinn, 1997; Quinn and Toyoda, 2008) and KA and its components, which seek to disentangle information about the effects of one type of restriction versus another, KAOPEN provides a composite indicator. Chinn and Ito use factor analysis on three categorical indicators of financial current account restrictions plus the five-year moving average of the 0-1 capital account openness dummy found in the IMF Summary Table. KAOPEN is the first standardized principle component of four AREAER table variables. Higher scores indicate greater financial openness as both a function of current and capital accounts (See Karcher and Steinberg, 2013 for a discussion of KAOPEN and its uses. They offer a critique of including the five-year moving average of the IMF binary measure).

Table 8 reports the correlations between our indicator of capital account openness and the indicators discussed above. Despite the high correlations reported, there are also some important differences. The cases of the China and India highlight why and how different *de jure* measures from the same source give different representations of capital account openness. For example, based on our indicator China and India have a score of 50 (ranking them 81st out of 126 countries). KAOPEN also ranks China and India as being equally closed (ranking them 105th out of 175 countries). Both indicators have India and China in the bottom half of the distribution in terms of openness. KA, which notes the presence or absence of restrictions across many indicators of financial instruments, ranks both countries as being almost closed with China (India) ranking 92th (96th) out of 100 nations survey. The KA indicator picks up the plethora of restrictions in India but does not capture the reduced intensity of India's restrictions.

C. Domestic Finance

Definition

The aggregate index on domestic finance regulations (*domfin*) is a composite of the following six sub-indicators:

- *Credit Controls (domfin_credit)*. It considers aspects of regulation related to the existence of reserve requirements, minimum amount of credit that is channeled to certain sectors, and credit subsidies.[6]

- *Interest Rate Controls (domfin_int)*. It captures government interventions in setting deposit and lending rates.

- *Bank Entry Barriers (domfin_entry)*. It quantifies the degree of domestic competition to foreign and domestic banks, as well as the range of financial activity that a bank can engage with.

- *Banking Supervision (domfin_sup)*. It examines whether a country has adopted a capital adequacy ratio based on the Basel standards, and whether there is an independent banking supervisory agency.

- *Privatization (domfin_priv)*. It captures the market shares of state-owned banks in the domestic financial system.

- *Security Market Development (domfin_sec)*. It considers whether a country has taken measures to develop securities markets.

We aggregate the various sub-indicators by their sum, normalizing it between zero and one.

Data sources

Available reports and relevant research articles produced by the IMF, such as Staff Reports of the Article IV Consultation, Financial System Stability Assessment (FSSA), Global Financial Stability Report (GFSR), IMF Selected Issues, and IMF Working Papers.

Coverage

From 1973-2014 for 90 countries, except for nine countries that were formed after 1973 (e.g., former Soviet Union countries).

How to construct the indicators

The construction of the structural reform indicators for domestic finance follows the approach used in Abiad et al. (2010). Abiad et al. (2010) provides data up to the year 2005, and we extend the data to the year 2014, using the same methodology.

The questions used to examine the degree of financial regulation as well as the coding rules are those used in Abiad et al. (2010). Compared to Abiad et al. (2010), we do not include the dimension of capital account restriction which is covered in the external finance index. We also do not

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[6] This indicator was originally a composite of two sub-indicators (see Abiad et al., 2010), but we simplify it by taking only one of the two sub-indicators, which is the "directed credit/reserve requirements" index.

calculate a sub-indicator named “aggregate credit ceilings” for simplification. As a result, our “credit controls” index is purely based on the “directed credit/reserve requirements” index, although it was a composite of “aggregate credit ceilings” and “directed credit/reserve requirements” in Abiad et al. (2010). Along each dimension, a country is given a score on a graded scale from zero to three, with zero corresponding to the highest degree of repression and three indicating full liberalization.

The identification of financial policy changes in the above six categories is carried through reading of available financial reports and relevant research articles produced by the IMF, such as Article IV Consultation, Financial System Stability Assessment (FSSA), Global Financial Stability Report (GFSR), IMF Selected Issues, and IMF Working Papers. Relying on IMF reports not only provides necessary country information on financial reforms, but it also implicitly provides a unified scoring standard, and consolidated evidence across countries, and over time. This ensures the cross-country and over-time comparability.

Descriptive statistics

Table 10 provides the basic summary statistics for the sub-indicators of financial liberalization. Each sub-index takes four integer values ranging from zero to three, where a higher value implies a higher degree of liberalization. The only exception is banking supervision, where a higher score reflects more regulation. Over the sample, the most liberalized areas are entry barriers, interest rate controls and security markets development. In contrast, banking supervision is the area with the highest regulation.

Most of the indicators are highly correlated, suggesting that countries with lower regulation in one area tend to have also lower regulation in other areas (Table 11, Panel A). At the same, the correlation for changes in the indicators are typically small suggesting that liberalization has occurred at different times for different dimensions in different countries (Table 11, Panel B).

We aggregate the various sub-indicators using their sum, normalized between zero and one. While any aggregation approach is subjective and arbitrary, this aggregation is robust to other aggregation approaches such as the Principal Component Analysis (PCA), the sum of squares and the sum of square roots, because all these aggregation methods lead to highly positively correlated indices (Table 12).

Figure 12 presents the average evolution of the composite financial indicators and of the sub-indicators over the period 1973-2014. The average degree of financial liberalization has improved dramatically over the past 42 years, with the index steadily increasing from roughly 0.2 in 1973 to 0.8 in 2014. The pace of liberalization has accelerated in the early 1990s, and has started to decline (and in some cases reverse) since the mid-2000s.

Figure 13 presents the evolution of the financial indicators across income groups (AEs, EMs, LICs). For all groups the pace of liberalization has increased around the mid-1990s, with AEs consistently having a more liberalized domestic financial market than EMs and LICs. Interestingly, while EMs and LICs had a similar level of regulation until the 1990s, liberalization has increased faster in EMs than LICs since then. The pattern of the composite indicator is generally reflected in the evolution of the various sub-indicators (Figure 14). At the same times, two observations stand out. First, many countries have increased credit controls since the mid-2000s. Second, progress in privatization has been typically faster in LICs than in EMs.

Figure 15 presents the evolution of the financial indicator across regions. Again, for all regions, the pace of liberalization has increased around the mid-1990s. By end of 2014, European economies are those with highest degree of liberalization, while countries in Middle East and Central Asia and in Sub-Saharan Africa are those with the lowest.

To examine whether changes in the indicators are the result of gradual or large scale reforms we classify policy changes in 5 categories: status quo, when there is no change in the composite indicator; major liberalizing (tightening) reforms when the change in the indicator falls in the top (bottom) 15 percent of the distribution of overall changes); reform (tightening) when the change in the indicator is higher (lower) than zero and below the top (bottom) 15 percent of the distribution of overall changes. Figure 16 and Table 13 provide the distribution of the policy changes. Liberalization reforms and large reforms respectively constitute about 18 and 3 percent of observations in the sample, and they have occurred mostly in the 1990s. Tightening and major tightening reforms are rare events. At the same time, the number of tightening reforms has increased in recent years and more so after the GFC, mostly reflecting tighter credit controls in several countries.

Case studies

We use two case studies, China and India, to compare the evolution of domestic finance policies (Figure 17). These countries capture several illustrative experiences of large emerging markets with liberalization experiences.

China started liberalizing its domestic financial market in the late 1980s with measures aimed at reducing credit controls. In the 1990s, it introduced measures to foster banking supervision and the development of security markets. Restrictions on entry and interest controls were partly lifted since the early 2000s. However, some of the past liberalizations have been partly reversed in recent years mostly in the areas of credit and interest rate controls. Finally, Chinese state-owned banks still account for majority of the banking system, and no progress in privatization has yet taken place.

In India, liberalization has been faster and more-broad based than in China. At the same, as in China, the financial system is mostly characterized by state-owned banks. Several measures have been introduced in the mid-2000s which have resulted in an increase in regulation in the area of banking supervision and credit controls.

Comparison with other databases

There is no other database that is directly comparable to our database, which extends a unique database about domestic financial regulations by Abiad et al. (2010). See Abiad et al. (2010) for a comparison with other databases

There is a relevant but quite different database: Financial Development Index by IMF. IMF staff recently created a number of indices that summarize how developed financial institutions and financial markets are in terms of their depth, access, and efficiency, culminating in the final index of financial development (see an IMF's SDN by Sahay et al., 2015). The sub-indices and the final overall index are constructed for 183 countries on annual frequency between 1980 and 2013. Financial institutions include banks, insurance companies, mutual funds, and pension funds. Financial markets include stock and bond markets. Financial development is defined as a combination of depth (size and liquidity of markets), access (ability of individuals and companies to access financial services), and efficiency (ability of institutions to provide financial services at low cost and with sustainable revenues, and the level of activity of capital markets). This broad multi-dimensional approach to defining financial development follows the matrix of financial system characteristics developed by Čihák et al. (2012). It draws on a number of data sources: the World Bank FinStats 2015 (Feyen, Kibuuka, and Sourrouille, 2014), IMF's Financial Access Survey, Dealogic corporate debt database, and Bank for International Settlement (BIS) debt securities database.

The main difference between this Financial Development Index database and ours is that the former measures financial depth, access, and efficiency, while our database measures the degree of financial regulations.

D. Product Market

Definition

The structural reform indicator for product market considers liberalization in two network sectors: telecommunication and electricity. The aggregated index *(prdm)* is constructed as the sum of two sub-indicators (*prdm_tel* and *prdm_elec*) and is normalized from zero to one. Each of these components is the simple average of the four sub-indicators of regulations considered respectively as follows.

Telecommunication

- *Access (prdm_tel_acc)*. It captures the degree of government intervention in the access to electricity.
- *Competition (prdm_tel_comp)*. It captures the degree of the market competition by the number of existing companies—that is, one (monopoly), two (duopoly), or three or more (competitive).
- *Regulation (prdm_tel_reg)*. It examines whether there is an independent regulatory agency.
- *Ownership (prdm_tel_own)*. It quantifies the extent of state-owned firms in the market.

Electricity

- *Wholesale (prdm_elec_ws)*. It examines whether there is a liberalized wholesale market.
- *Unbundling (prdm_elec_unb)*. It captures the degree of vertical integration in the market—that is, whether generation, transmission, and distribution are unbundled.

- *Regulation (prdm_elec_reg)*. It examines whether there is an independent regulatory agency.

- *Ownership (prdm_elec_own)*. It quantifies the extent of state-owned firms in the market.

Along each dimension, a country is given a score on a graded scale from zero to two, with zero corresponding to the highest degree of repression and two indicating full liberalization.

Data sources

The identification of policy changes in the telecommunication market is facilitated by regulatory information from International Telecommunication Union (ITU), a specialized agency of the United Nations for information and communication technologies (ICTs) that directly collects yearly data from member countries.[7] Supplementary documents include assessments and surveys from multinational institutions, such as the European Bank for Reconstruction and Development (EBRD) and the Organization for Economic Co-operation and Development (OECD), annual reports from countries' regulatory authority and telecommunication-related laws promulgated by countries legislative body.

The main sources for the construction of the electricity market indicator are the annual issues of *Electricity Regulation*, the website of the International Energy Agency (IEA) and country profiles from the Clean Energy Info Portal (reegle).[8] Additional sources include evaluations and reports from the EBRD, the OECD, the World Bank and the Council of European Energy Regulators (CEER), and annual reports from countries' regulatory authority.

Coverage

From 1973-2014 for 90 countries, except for nine countries that were formed after 1973 (e.g., former Soviet Union countries).

How to construct the indicators

The scores at the most disaggregated level are assigned according to the following tables:

Telecommunication Market Indicators

Index Score	0	1	2
Competition	Monopoly	Duopoly (two companies)	Competitive (three or more companies)
Regulation	Otherwise	A separate regulatory body (other than the government) has	N/A (i.e., no country is assigned score 2)

[7] http://www.itu.int/net4/itu-d/icteye/Default.aspx

[8] An information gateway, reegle (http://www.reegle.info/about), is maintained by the Renewable Energy and Energy Efficiency Partnership (REEEP) and the Renewable Energy Policy Network for the 21st Century (REN21).

		established; and the authority issues relevant license	
Access	No regulation; or charges set by the incumbent	Bilateral agreements approved by the authority or general framework with the regulatory body solving disputes	Interconnection charges set by the authority
Ownership	State owned (private ownership less than 20%, no golden shares)	Partially owned by state	Privately owned (state ownership less than 20%, no golden shares)

Electricity Market Indicators

Index Score	0	1	2
Unbundling	A vertical integrated operator handles generation, transmission, and distribution	Otherwise (partial unbundling—e.g., Generation is unbundled from transmission but still transmission and distribution are integrated)	Generation, transmission, and distribution are completely unbundled
Regulation	Otherwise	A separate regulatory body, other than government has established; and the authority sets service tariffs and issues relevant licenses	N/A (i.e., no country is assigned score 2)
Wholesale	Otherwise	A liberalized wholesale market exists where generators compete to sell power to distributors or to large costumers	N/A (i.e., no country is assigned score 2)
Ownership	State owned (private ownership less than 20%, no golden shares)	Partially owned by state	Privately owned (state ownership less than 20%, no golden shares)

Descriptive statistics

Table 14 presents descriptive statics for each of the sub-indicator. On average, liberalization has been larger in telecom than electricity, and within telecom in the area of ownership (that is, privatization).

Most of the indicators are highly correlated, suggesting that countries with lower regulation in one dimension tend to have also lower regulation in other dimensions (Table 15, Panel A). In some cases, the correlation for annual changes in the indicators are sizeable (for example, telecom access and regulation; electricity wholesale and unbundling). But for most of the cases, the correlations are low suggesting that reforms across different areas tend to do not occur at same time (Table 15, Panel B).

The aggregate index of product market liberalization is computed by adding up all 8 sub-indices, and then normalized the sum between 0 (fully restricted market) and 1 (fully liberalized market). To check robustness, we also explored alternative aggregation methods, such as principle component analysis (PCA), sum of squares (giving more weight to reforms), and sum of square roots (giving less weight to reforms). All these different aggregate indices are highly positively correlated with statistical significance, demonstrating that our index is robust to different aggregation methods (Table 16).

Figure 18 presents the average evolution of the composite product market indicator over the period 1973-2014. In the past 40 years, the restrictions in product market have been reduced drastically, with the index increasing from 0.03—almost fully restricted market—in 1973 to around 0.69 in 2014. Liberalization has typically taken off in the late-1990s and has slowed in recent years. Among the country groups, AEs have experienced the fastest and deepest reforms in product market with an index value of 0.82 in 2014, while LICs have the least competitive product market (Figure 19). The notable difference across country income groups in the electricity market comes from the wholesale indicator, with almost no liberalization of wholesale market (index value close to 0) in LICs compared to large liberalization (index value close to 1) in AEs. For all groups, state-owned enterprises still play a large role in electricity market. For the electivity market the man differences stem from the area of competition and ownership, which are fully liberalized in AEs but still regulated in EMs and LICs.

Figure 20 reports the evolution of the indicator across regions. Although initially falling behind Western Hemisphere in terms of liberalization, nowadays Europe has the highest score—0.83 in the index, representing the most liberalized product market among the five regions. Sub-Saharan Africa and Middle East have experienced the least liberalization, sharing nearly identical path of evolution as well as values of the aggregate index.

Figure 21 illustrates the distribution of reforms in each sub-dimension of electricity and telecommunication markets throughout our sample period. Liberalization began to take off in 1989 and reached to the peak in 1998 when concurrent reform episodes are observed across all 8 sub-dimensions. Major liberalizing reforms and liberalizing reforms account for about 2 and 11 percent of observations in the sample (Table 17). On average the telecommunication market has seen more reforms (376 reform episodes) than the electricity market (266 reform episodes).

Case studies

Figure 22 presents the evolution of product market indicator for India. Liberalization took place in 1997 when the independent Telecom Regulatory Authority of India (TRAI) was formed. The New Telecom Policy of 1999 allowed privatization of telecom companies, opening the market fully for competition. In 2003, India introduced the Telecommunication Interconnection Usage Charges Regulation, fixing the interconnection charges by the regulator. India established the Central Electricity Regulatory Commission (CERC) as an independent regulator under the Electricity

Regulatory Commissions Act in 1998. The Electricity Act of 2003 fully unbundled the industry, followed by liberalization of the wholesale market in 2009. During the period between 1997 and 2009, India has made substantial progress in liberalizing telecommunication and electricity markets, reflected by the increasing values of the product market index from 0—fully restricted market to 0.77—highly liberalized market.

Comparison with other databases

We compare our indicator with the OECD product market regulation (PMR) indicator (Nicoletti and Scarpetta 2003; Kerdrain et al. 2010). While our indicator covers a larger sample of countries (90 compared to 44 in the OECD database), the OECD provides measures of competition in other sector of the economies, including other networks (transportation, gas, and post), as well as retails distribution and professional services. In addition, the OECD indicators are compiled using the responses of national governments to the OECD Regulatory Indicator Questionnaires and therefore are likely to be less subject to measurement errors.

Another difference is in the sub-indicators used to score the degree of competition in product markets. The OECD PMR indicator incorporates four sub-indices for electricity market: entry, public ownership, vertical integration, and market structure, and three sub-indices for telecommunication market: entry, public ownership and market structure.

To check the reliability of our measures, we compute the correlation between our indicators and those of the OECD (Table 18). Overall the correlations are very high. The public ownership index in our dataset is positively correlated with the OECD PMR with a coefficient of 0.87 in electricity market and 0.85 in telecommunication market. Correlation between the electricity unbundling index and its corresponding index, vertical integration, in the OECD PMR dataset is about 0.8. Th telecom competition index and telecom entry index in OECD PMR dataset are also highly correlated (about 0.9). Finally, our composite indicator is also extremely highly correlated with the overall OECD PMR network indicator (the correlation is 0.91), suggesting that countries with high regulation in one network sector tend to have also high regulation in other sectors.

E. Labor Market

Definition

The labor market liberalization (LML) indicator provides a new measure of employment protection legislation (EPL) related to termination of fulltime indefinite contracts for objective reasons. The aggregated index *(labor)* is constructed as the sum of the following five sub-indicators and is normalized from zero to one. The five dimensions of EPL considered are as follows:

- *Valid grounds (labor_vg)*. It captures the freedom of the employer in deciding when to dismiss workers and which workers to dismiss.
- *Procedural inconvenience (labor_pi)*. It includes provisions such as consultation with workers' representatives and third-party approval.

- *Firing costs (labor_fc)*. It consists of minimum notice periods and severance payments.

- *Redress measures (in case of unfair dismissal) (labor_rm)*. It concerns provisions such as the possibility for the worker of being reinstated in employment or to receive a compensation following an unfair dismissal.

- *Additional requirements for collective dismissals (labor_cd)*. It accounts for additional restrictions imposed to the employer when dismissing a large number of workers for economic reasons.

Each sub-index is constructed by taking the simple average of several further granular indicators and is normalized to range from 0 (highest regulation) to 1 (highest liberalization).

Data sources

The identification of policy changes is based on statutory legislation setting minimum requirements. The main sources of legislations are EPLex (ILO, 2017a) and NATLEX (ILO, 2017b) databases. Secondary sources include government gazettes and parliamentary records.

Coverage

From 1973 to 2014 for 90 countries, while for several countries, old legislations cannot be retrieved, and the index does not cover early years for these countries, including the countries that were formed after 1973 (e.g., former Soviet Union countries).

How to construct the indicators

The indicators are generally based on official laws. The only exception concerns collective agreements, of which we only capture those applied to all sectors of the economy. The indicators are *de jure*. To reconstruct the history of EPL in a given country, we start from its current laws and trace the evolution backwards. To identify current legislation, we rely on the EPLex database. When this is not available or not up to date, we use the NATLEX database.[9] The way in which we backtrack older legislation is thought to ensure that we do not miss any relevant change. For each country, we follow three distinct approaches to backtrack older legislation. First, we check whether the current laws specify which older laws they repeal or amend upon their entry into force. If this is the case, we identify older legislation in this way. Second, we check the coverage of older legislation provided by NATLEX. Third, we rely on country-specific databases and other sources, such as, for instance, the collection of government gazette and scholarly articles. Finally, we cross-check the information gathered in these different ways to reconstruct the evolution of EPL.

[9] EPLex is a database providing information on all the key topics that are regularly examined in studies on employment termination legislation, and it is available for 95 countries for the most recent years. NATLEX is a database of national labor, social security and related human rights legislation. NATLEX contains references to both current and repealed legislation in employment termination, and it covers 196 countries. Both EPLex and NATLEX are compiled by the International Labour Organization.

Each sub-indicator is constructed as the average of several different variables. As an example, to create the procedural inconvenience indicator, we consider different aspects such as (i) notification to third parties, (ii) authorization by a third party, (iii) delay before notice can be served, (iv) consultations with workers' representatives, and (v) social plan. For each of these aspects, we construct a variable which can take value between 0 and 1. For instance, the third-party authorization variable takes value 0 if no authorization is needed; value 0.5 if authorization by either the public administration or workers' representatives is needed; and value 1 if approval by both these parties is required. We proceed in a similar way for all other variables related to procedural inconvenience and for the other sub-indicators.

In some cases, different regulations apply to white- and blue-collar workers and firms of different sizes.[10] Therefore, each of the five sub-indexes is first constructed as the average regulation applying to blue and white collars in firms of 5, 30, and 150 workers, respectively, and is then aggregated by simple averaging over the types of workers and the firm sizes.

See Alesina, Ciminelli, and Furceri (forthcoming) for a more comprehensive explanation on how these indicators are constructed.

Descriptive statistics

Table 19 provides the basic summary statistics for the sub-indices of EPL. Figure 23 shows the global evolution of the indices over time. Table 20 presents the correlation matrix among sub-indices for both levels and annual changes. The indicators are not highly correlated, suggesting that countries with lower regulation in one area do not necessarily have also lower regulation in other areas (Panel A). In addition, the correlation for changes in the indicators are typically small suggesting that liberalization has occurred at different times for different dimensions in different countries (Panel B).

We aggregate the various sub-indicators using their sum, normalized between zero and one. This aggregation is robust to other aggregation approaches such as the Principal Component Analysis (PCA), the sum of squares, and the sum of square roots (Table 21).

Figure 24 presents the average evolution of the composite indicator by group of countries of different income levels. In contrast to other reform indicators, regulation in employment protection legislation has increased since the 1970s up to the most recent years, when several liberalizing reforms have been introduced (notably in European countries).

The region with by far the highest degree of LML is the Western hemisphere (the Americas), while the one with the lowest degree of LML is the Middle East and Central Asia (Figure 25). Interestingly, the Sub-Sharan African region displayed levels of liberalization similar to the Americas until the mid-1990s, but it converged to European levels in the most recent years. The fact that the LML dispalys larger variation across regions thant income groups may suggest that

[10] A worker is defined as blue (white) collar if she perform mostly manual (office) tasks. The choice of considering both blue- and white-collar workers and the aggregating rationale is in line with work done at the Organization for Economic Co-operation and Development (OECD, 2013).

culture and institutional characteristics may be more important than economic factors in explaining the level of LML. This is in line with the finding of Botero et al. (2004) that legal origin is the most important factor in explaining the level of employment protection.

The evolution of specific regulation types reveals additional interesting information. For example, European and Latin American countries seem to feature two very different models of EPL. The former (latter) display high (low) scores for procedural requirements and redress measures, while firing costs are relatively low (high). This suggest that in Europe it is more difficult to dismiss workers than in Latin America, but it is also less expensive.

Figure 26 and Table 22 provide the distribution of policy changes. Over the entire sample, tightening reforms (increases in regulations) are more frequent than liberalizing reforms (decreases in regulation). Only in recent years, we observe a larger number of liberalizing reforms than tightening ones. Finally, liberalizing and tightening reforms are typically smaller in AEs than in EMs and LICs.

Case studies

We illustrate and compare the evolution of EPL in Vietnam and Georgia. These countries are interesting cases as they were both one-party communist states until 1991. While Georgia declared independence from the Soviet Union in that year and reformed its political system in a more democratic sense, Vietnam remained a single-party state. However, although with different degrees, both countries have embraced the free-market economy in the last decade.

The two countries had very similar level of LML until 1987 (Figure 27). In both countries, the system was framed to have the workers at the center of labor relations, and it was also characterized by a heavy presence of trade unions. This resulted in four fundamental principles: (i) dismissals were allowed only in specific cases; (ii) the employer was required to first try transfer the worker to another position before carrying out an economic or professional incapacity dismissal; (iii) the consent of the trade union was required before dismissing the worker; and (iv) re-instatement in employment was the main redress measure to an unfair dismissal. In turn, firing costs were relatively low in both countries.

In 1987, employment protection was further tightened in Georgia, in the context of a Soviet Union-wide change to the system. Both severance payments and notice periods were increased, and the notion of priority for re-employment to dismissed workers was introduced. In Vietnam, instead, firing costs were increased during three distinct episodes between 1990 and 1995. Following the Rose Revolution of 2003, the Georgian political and economic system was swept by a series of liberalization reforms, which also involved the termination of employment contracts. The LML indicators point to a dramatic liberalization that happened in 2006. The system was completely reformed by the introduction of a new Labor Code embracing the principle of dismissal at will. This major reform was partially reversed in 2013, when the requirement of valid grounds for dismissal and redress measures were introduced. As of today, however, Georgia remains a relatively liberalized country. In contrast, Vietnam did not experience any liberalizing reform. In contrast, the system was tightened in 2003, when new redress provisions were introduced, and again in 2013, when a new law restricted the valid grounds for dismissal to just a few specific cases.

Comparison with other databases

This paper is not the first in providing indicators of LML. Earlier academic contributions include Botero et al. (2004), Aleksynska and Schindler (2011), Campos and Nugent (2012), and Adams, et al. (2017). Moreover, institutions such as the OECD (2013), World Bank (2016) and the ILO (2015) have also developed their own indicators of LML.[11]

In comparing the indicators constructed in this paper with the others available in the literature, the focus is confined to those of Botero et al. (2004) and OECD (2013), which are arguably the most used in empirical work. Botero et al. (2004) construct two indicators of LML related to termination of indefinite contract for a cross section of 85 countries in the year 1997. These are the Cost of Firing Workers Index (CFWI) and the Dismissal Procedures Index (DPI). OECD (2013) provides three different indicators of LML for an unbalanced sample of 73 OECD and non-OECD countries. These encompass all procedural requirements, firing costs and redress measures. The three versions differ among themselves in the sample coverage and the provisions considered. The first version starts in 1985 but it does not consider collective dismissals. The second version includes collective dismissals, but it ranges only from 1998 to 2013. The third version considers one additional redress provision than the second version, but it only starts in 2008. Finally, for all three versions non-OECD countries are only covered from 2008 onwards.

A direct comparison between the indicators of LML proposed in this paper and those of Botero et al. (2004) and OECD (2013) is problematic due to methodological differences in their construction. As an excercise to check the quality of the data collection underpinning the current analysis, a new set of indicators is constructed applying the methodologies of Botero et al. (2004) and OECD (2013) to the data collected here.[12]

[11] World Bank (2016) provides survey-based data about redundancy dismissal costs for a panel of 181 countries. The data are available only for the 2004-2015 period. Aleksynska and Schindler (2011) construct a balanced dataset about legally mandated firing costs for redundancy dismissals for 91 countries over the 1980-2005 period. Campos and Nugent (2012) extend the work of Botero et al. (2004) to 140 countries over the 1950-2005 period. However, they only provide one composite index of EPL for the three areas of employment termination, the usage of alternative employment contracts and the cost of increasing hours worked. The index is at the 5-year frequency. Adams et al. (2017) provide a database of labor regulation in 117 countries over the period 1970-2013 but do not construct a synthetic indicator. Finally, the International Labour Office recently started publishing its EPL database, also called EPLex. This provides a wide range of information regarding (i) substantive requirements for dismissals, (ii) procedural burdens for individual as well as collective dismissals, (iii) monetary costs, and (iv) remedies following wrongful dismissals. The EPLex covers 95 countries for the 2009-2013 period.

[12] The index replicating the CFWI of Botero et al. (2004) does not include no reason dismissals. This is because Botero et al. (2004) also considers collective agreements, which in many cases limit the possibility of dismissal at will. When dismissal at will is not allowed, Botero et al. (2004) code firing costs as being equal to the wage bill of 1 year. Since the current work only consider *de jure* minimum requirements, differences in the classification of dismissal at will are present. This can produce large discrepancies among the original CFWI of Botero et al. (2004) and the replica produced here, if no reason dismissals are considered.

Tables 23 and 24 report the correlation coefficients between the original indexes of Botero et al. (2004) and OECD (2013) and their replicas developed here. A distinction is made between AEs, EMs, and LICs. In all cases, the correlation is highest among AEs. For AEs, the correlation between the original synthetic indicators of Botero et al. (2004) and OECD (2013) with the current replicas are high (at 0.91 and 0.80 respectively). However, looking at the indicators of Botero et al. (2004) the correlation is much lower for the CFWI than for the DPI. This is possibly due a difference in the way severance payments are coded. This difference is explained later.

The improvements that the newly proposed methodology brings relative to those of Botero et al. (2004) and OECD (2013) can divided in four main categories: (i) consideration of redress measures (relative to Botero et al. 2004); (ii) separation of objective reason dismissals from the rest (relative to OECD, 2013); (iii) identification of timing of reforms (relative to OECD, 2013); and (iv) coding of severance payments (relative to both Botero et al., 2004 and OECD, 2013).

First, Botero et al. (2004) do not account for valid grounds and redress measures following unfair dismissals. As shown earlier, redress measures are not closely correlated to firing costs and procedural requirements. Hence, their evolution needs to be duly accounted for. Second, OECD (2013) mixes up provisions regarding redundancy dismissals, with other dismissal situations, such as personal reason, no reason and discriminatory dismsisals.

To illustrate why this may be problematic, it is useful to take the case of Bolivia as an example. The Supreme Decree 28699 (Ministerio de Economia y Finanzas Publica, 2006) states that if the employer wants to dismiss a worker for reasons not related to the worker's conduct, the worker can decide whether to accept or not the dismissal (see also Ministerio de Economia y Finanzas Publica, 2010). Assuming that the worker always refuses the dismissal, this amounts to an almost absolute protection of the worker. The index constructed here reflects this. Specifically, the newly proposed methodology consists in (i) constructing one index for each dismissal situation, (ii) assigning minimum value to the cases in which the specific dismissal is not allowed, and (iii) averaging together the different dismissal stituations to obtain a single index. According to this methodology, Bolivia receives a very low score (indicating low LML). This reflects that only gross misconduct dismissals are allowed. Instead, in OECD (2013) different dismissal situations are mixed together. When certain types of dismissals are not allowed, only provisions applying in the allowed dismissal cases are considered. Using this methodology, Bolivia has a highly deregeulated EPL system—according to OECD (2013) it is 21st most liberal country, out of a total of 73.

An example at the other extreme is the United States. There the employer is generally allowed to freely dismiss workers (only discriminatory dismissals are considered to be unfair). Hence, the newly proposed index assigns maximum value to the valid grounds and redress measures sub-index (maximum liberalization). Instead, OECD (2013) consider redress measures in case of discriminatory dismissals as having general application and thus it does not treat the United States as a completely liberalized country.

Further improvements over Botero et al. (2004) and OECD (2013) are illustrated next. First, collecting information from legislative documents, it is possible to precisely identify the year of the each reform. Comparing the new index with OECD (2013), there are a total of 19 cases in which the same reform is identified one year earlier.[13] Second, the new index improves relative to existing ones in the coding of severance payments. Both Botero et al. (2004) and OECD (2013) code any monetary payment that is due by the employer to the worker at the moment of contract termination as a severance payment. This includes payments that are due regardless of the reason for termination. Here, instead, only specific additional payments that are due by the employer when she decides to terminate the contract at her own initiative are coded as severance payments. The rationale of this choice is to only account for those provisions that create an additional burden to the employer relative to the standard cases of termination due to old age.

The new methodology also refines the coding of a number of variables: (i) it reduces the degree of subjectivity in the coding of re-instatement provisions; and (ii) it better captures differences in EPL by relying on coninuous rather than discrete variables to code for severance payment, notice period, backawages and priority for re-employment. Moreover, firms of comparable sizes are used to account for the definition of collective dismissals. Instead, OECD (2013) code the definition of collective dismissals based on provisions applying to firms of different sizes. This can give rise to incosistencies since firms of different sizes have normally different thresholds defining a collective dismissals.

Finally, covering 90 countries over a 42 year period, the new index has much more observations, 3165, than those of Botero et al. (2004) and OECD (2013), respectively 85 and 887.[14]

[13] The 19 cases are: Germany (1993), Finland (1996), United Kingdom (1999 and 2012), Belgium (2000), New Zealand (2000), France (2002), Portugal (2003, 2009 and 2011), Turkey (2003), Estonia (2009), Greece (2010 and 2012), Spain (2010 and 2012), Brazil (2011) and Hungary (2012)

[14] The total number of observations is not exactly equal to the number of cross sections times the number of periods (that is 3780). This due to the fact that (i) some countries only became independent after 1973 and (ii) information is missing in some cases.

IV. Figures

Figure 1. Trade reform indices

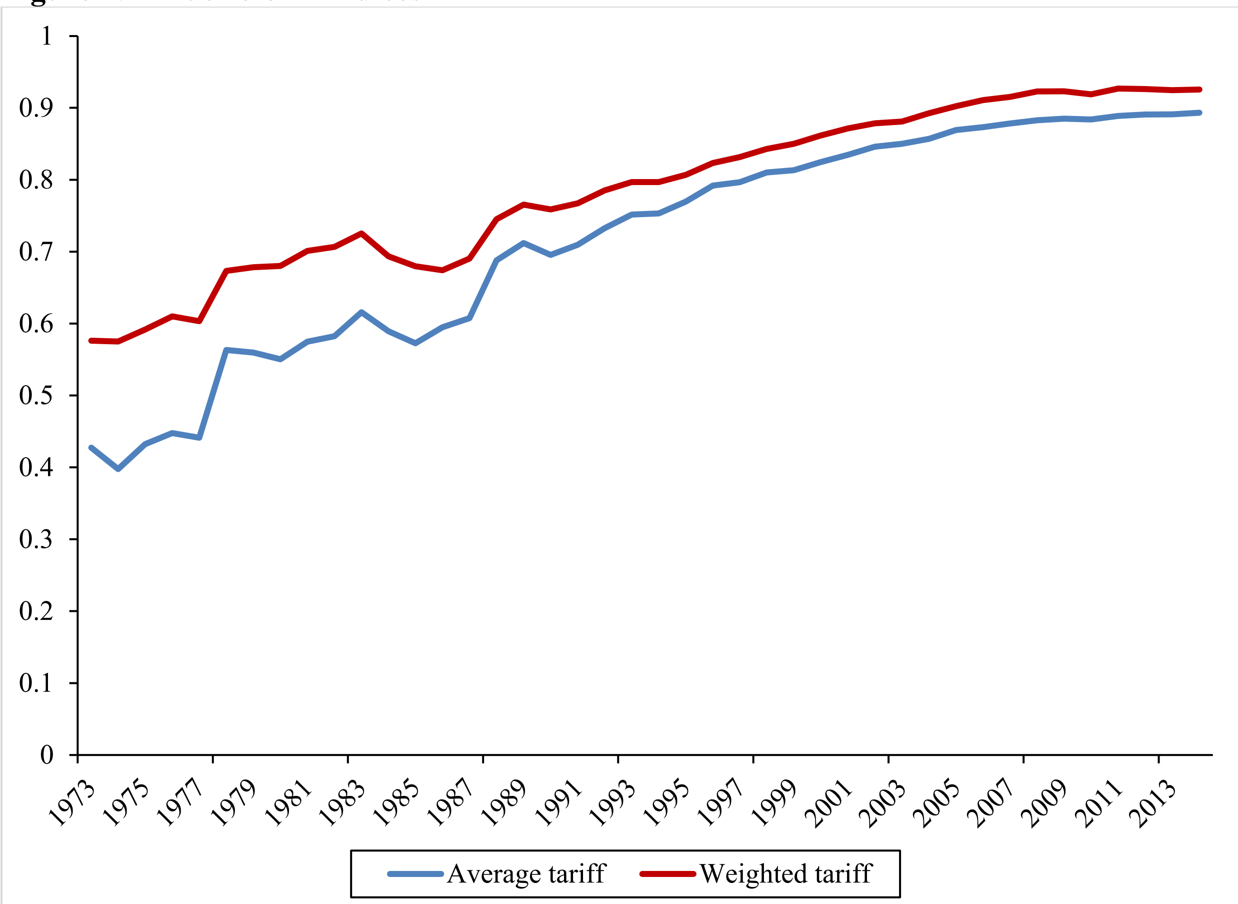


Figure 2. Average tariff by economy

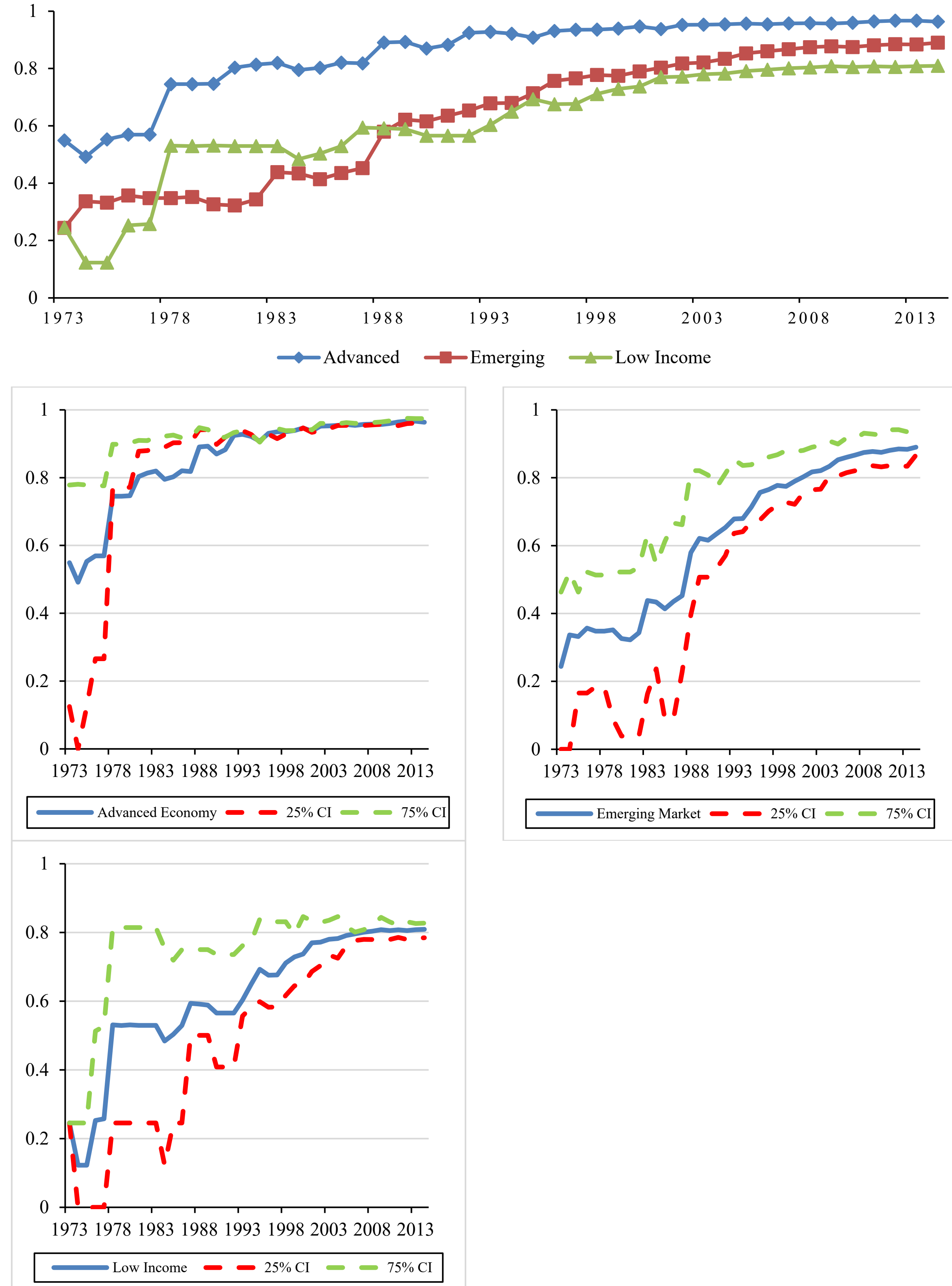


Figure 3. Average tariff by region

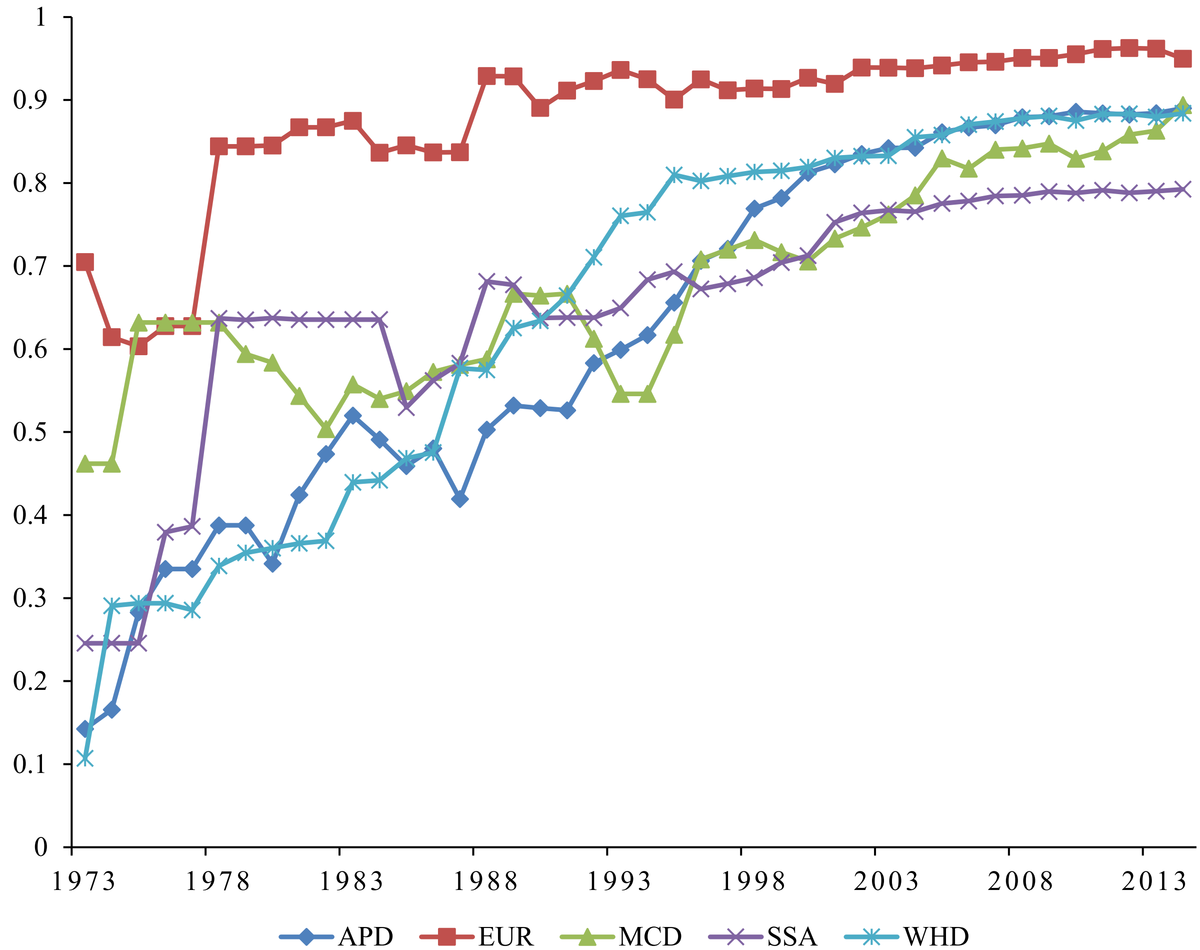


Figure 4. Distribution of tariff rate changes, 1973-2014

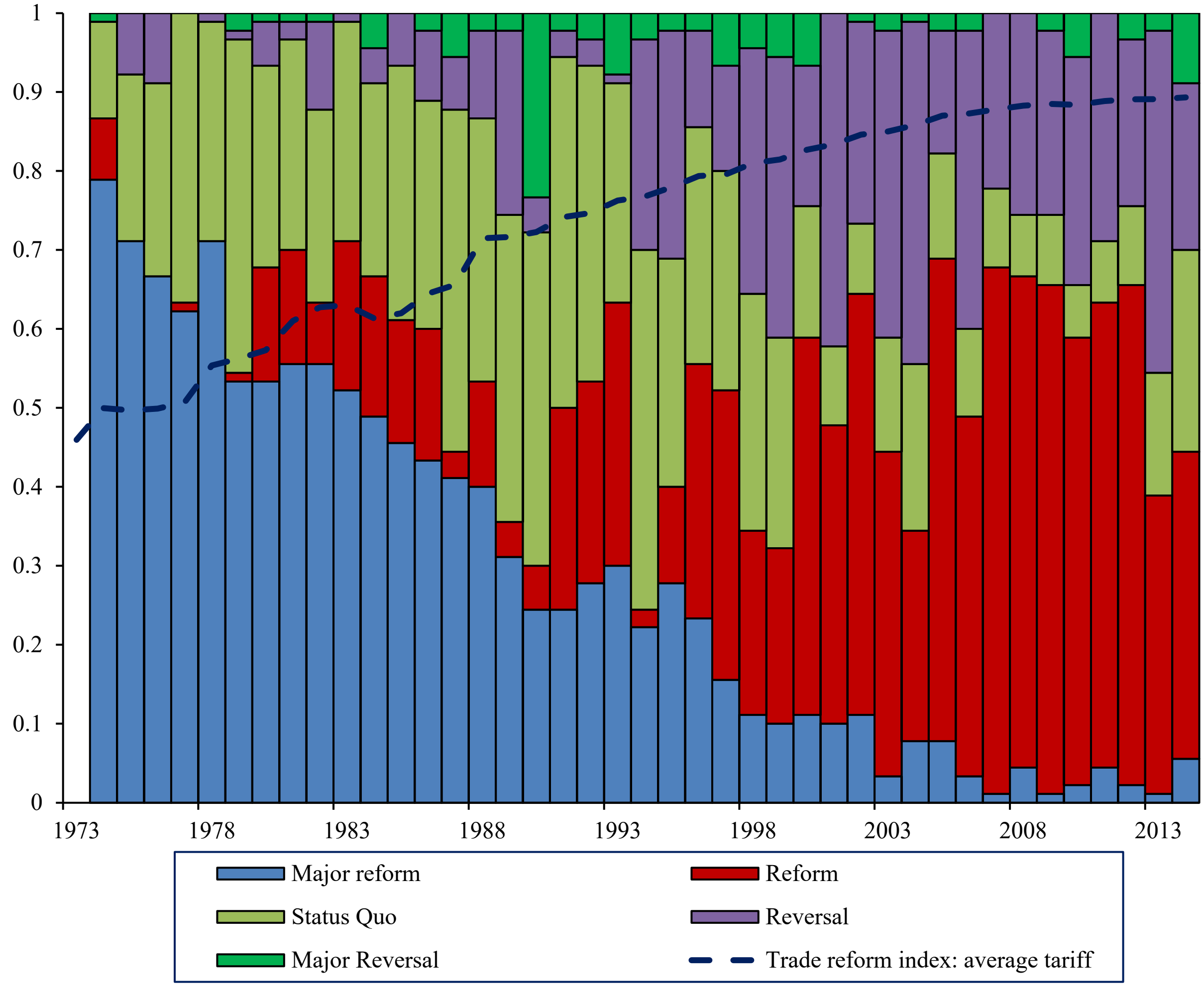


Figure 5. Case studies for trade reforms

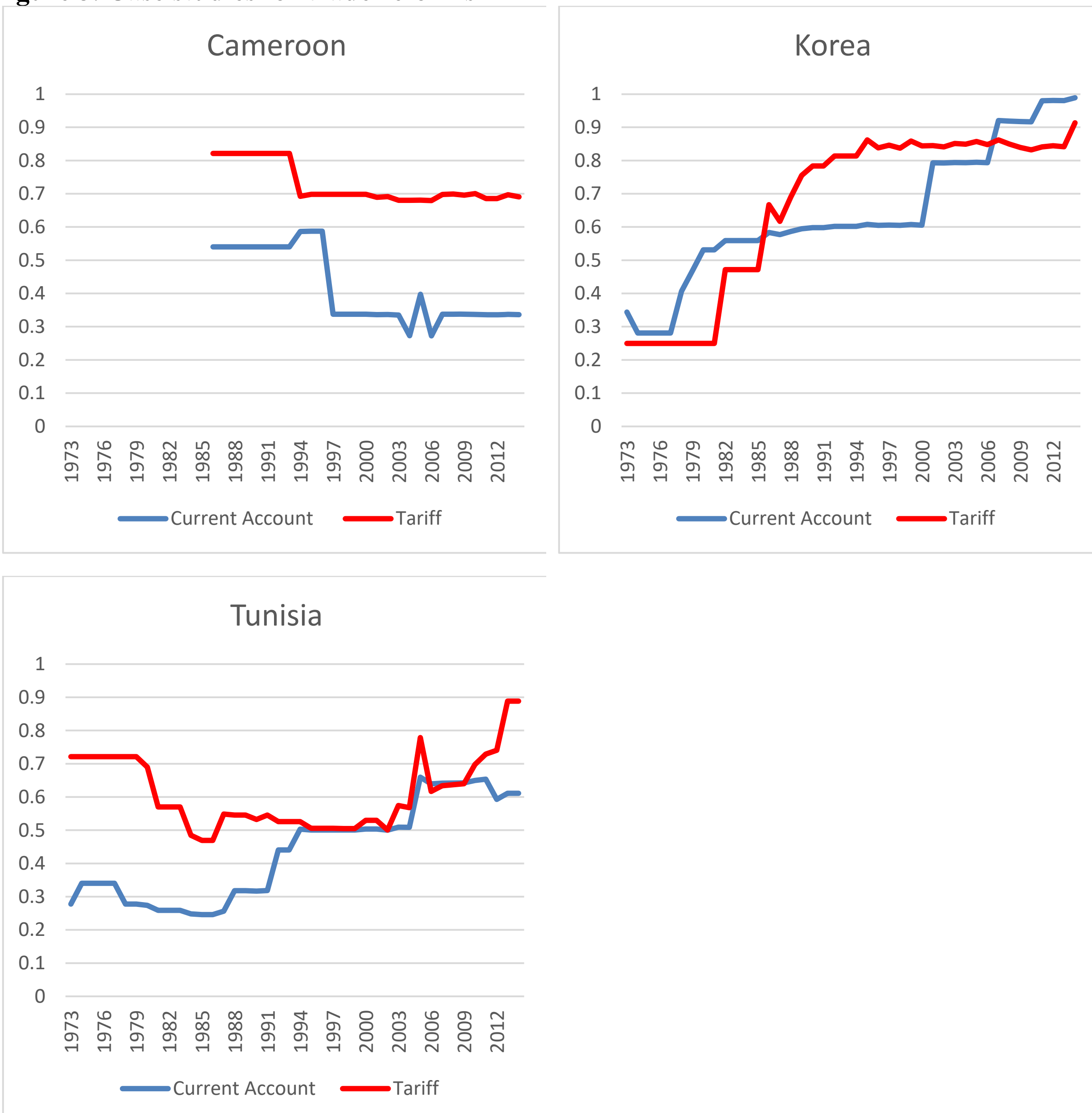


Figure 6. Global average of capital and financial account

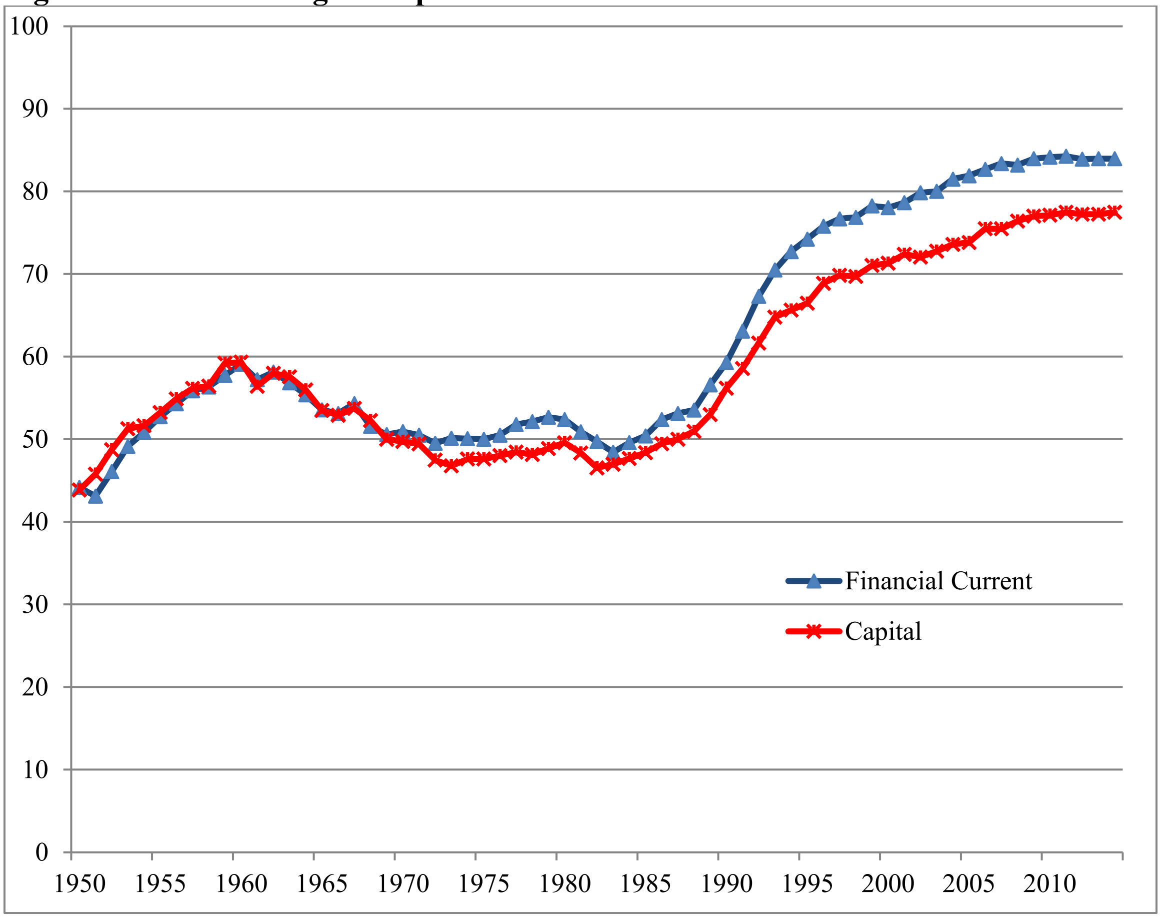
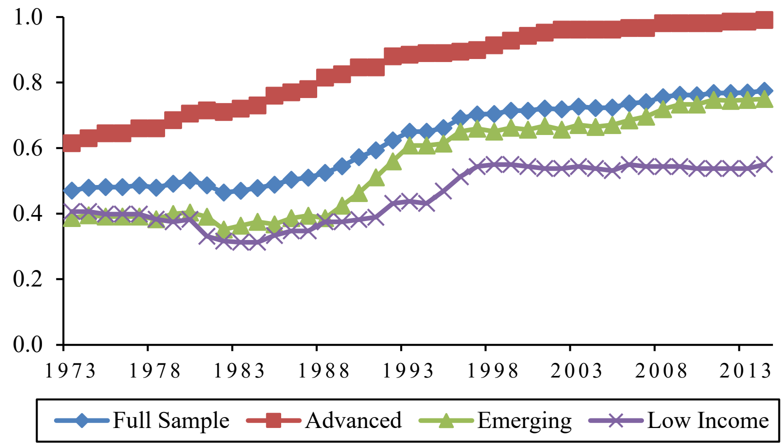
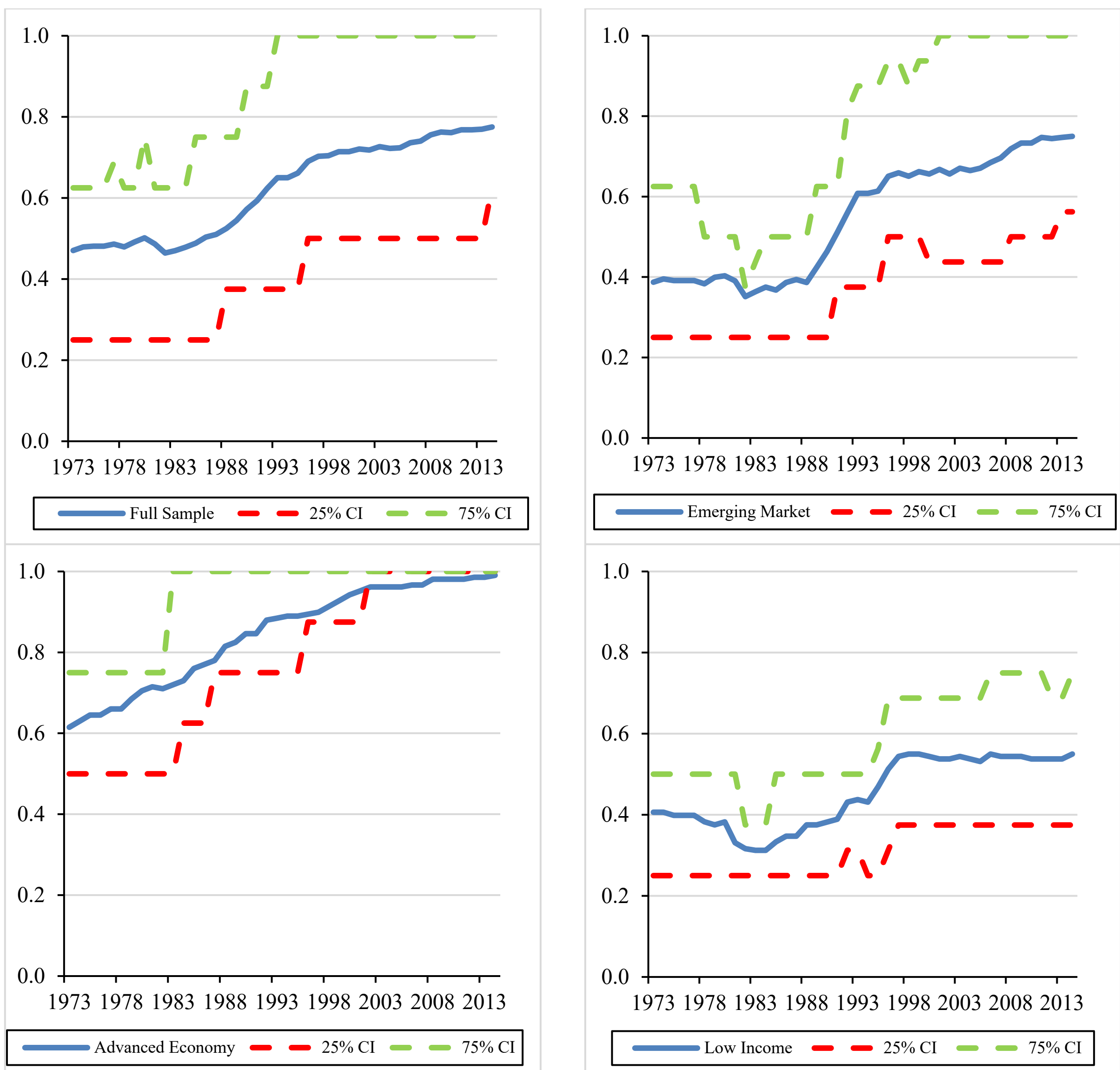


Figure 7. Capital and financial account by income groups
Panel A Capital account by economy





Panel B. Current account by economy

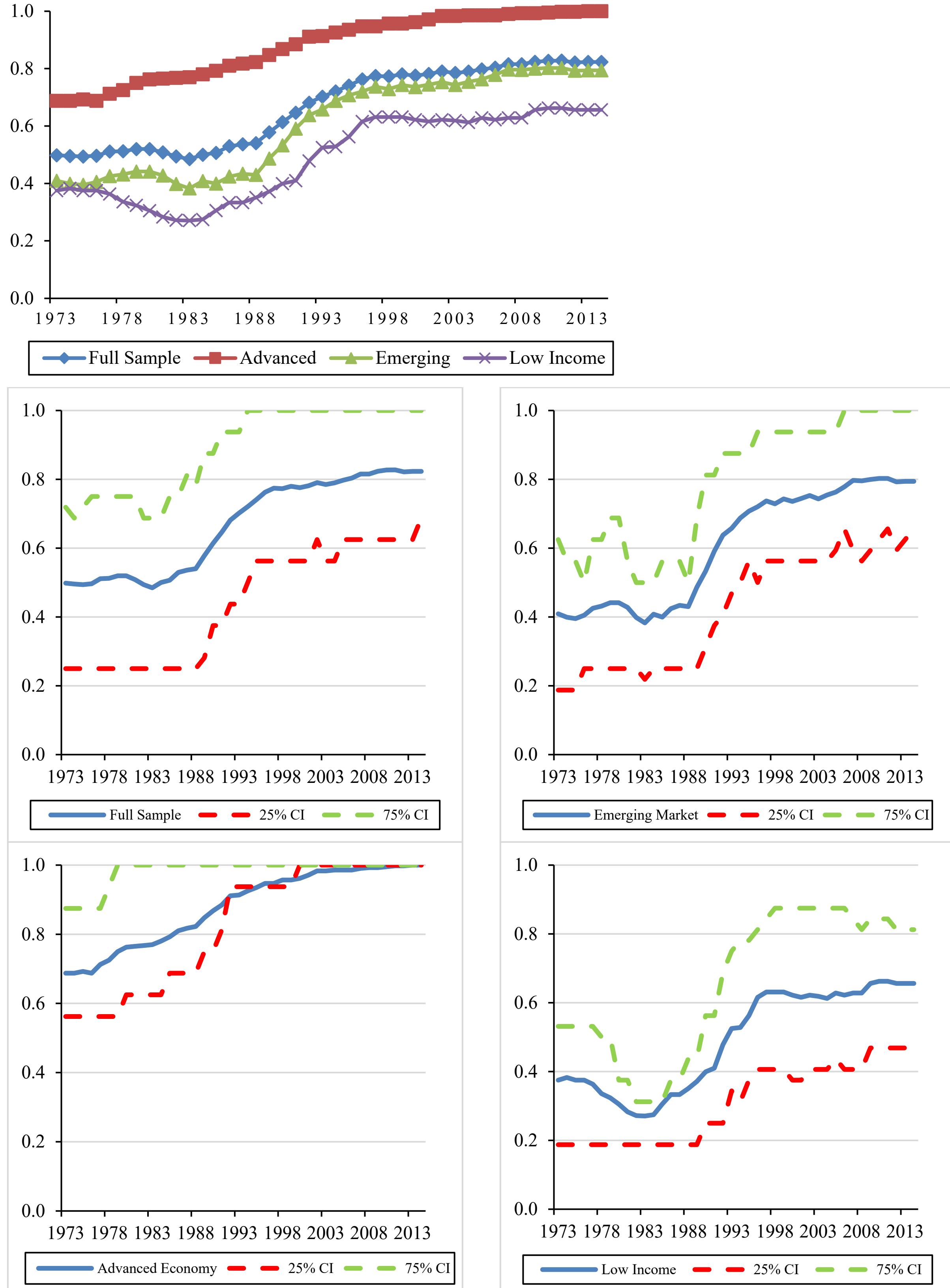
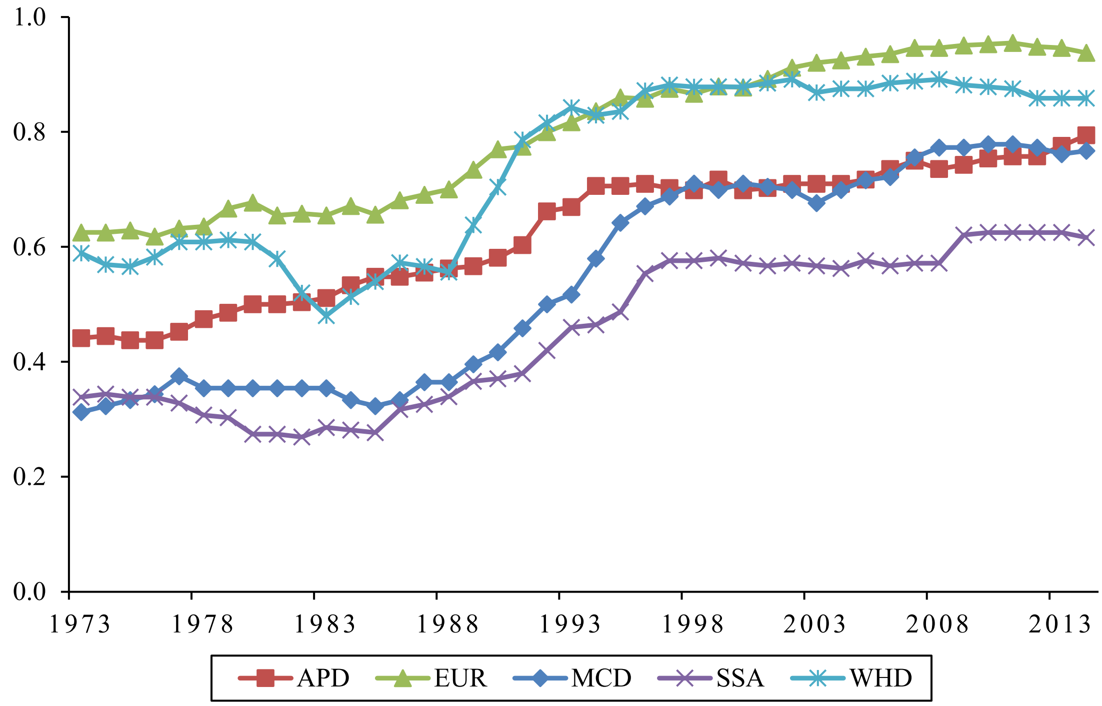


Figure 8. Capital and financial account by regions

Panel A. Financial account by region



Panel B. Capital account by region

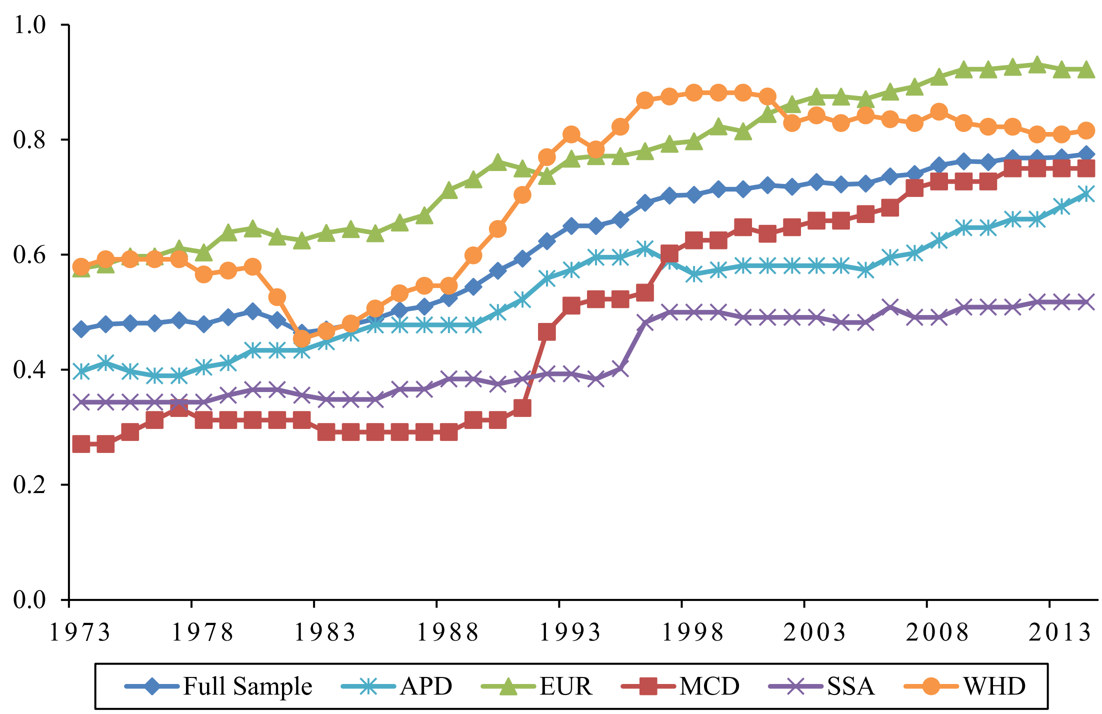
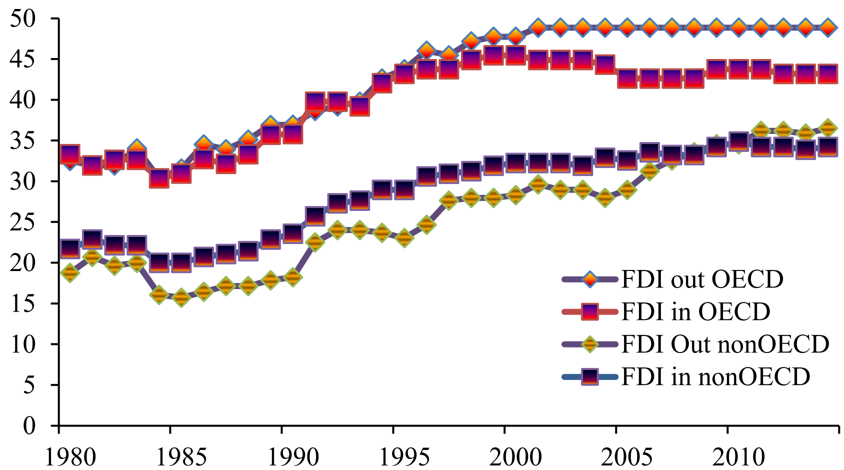
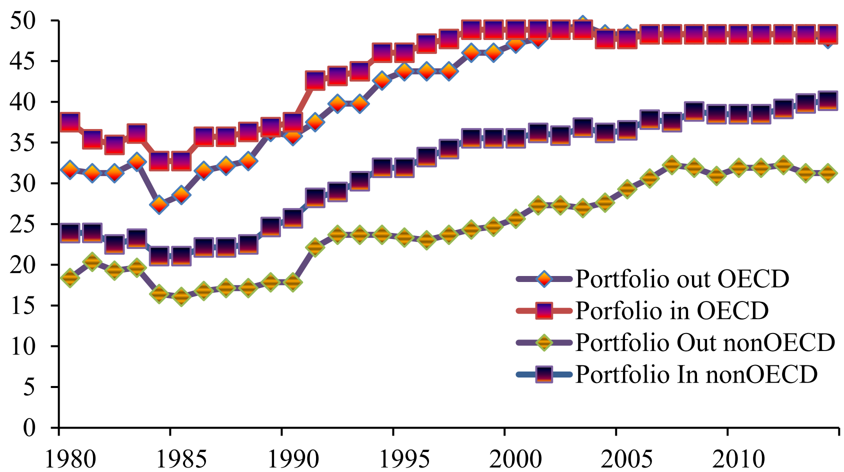


Figure 9. Decomposition of capital account

Panel A: FDI



Panel B: Portfolio Equity Investment



Panel C: Financial Credit

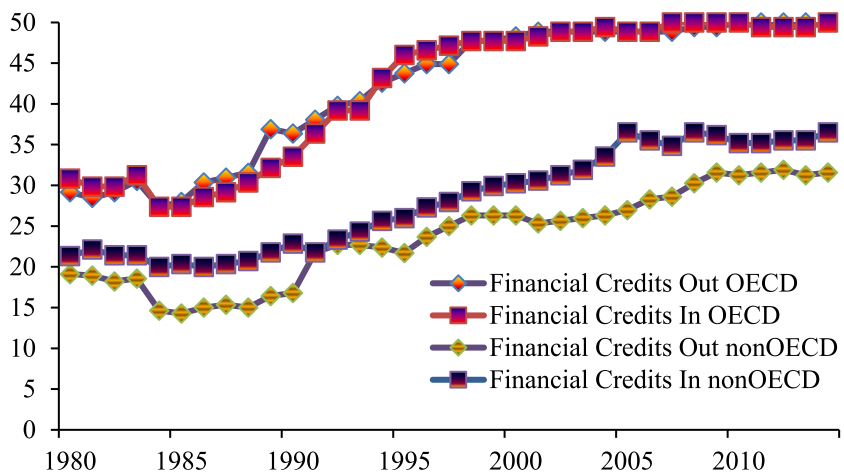
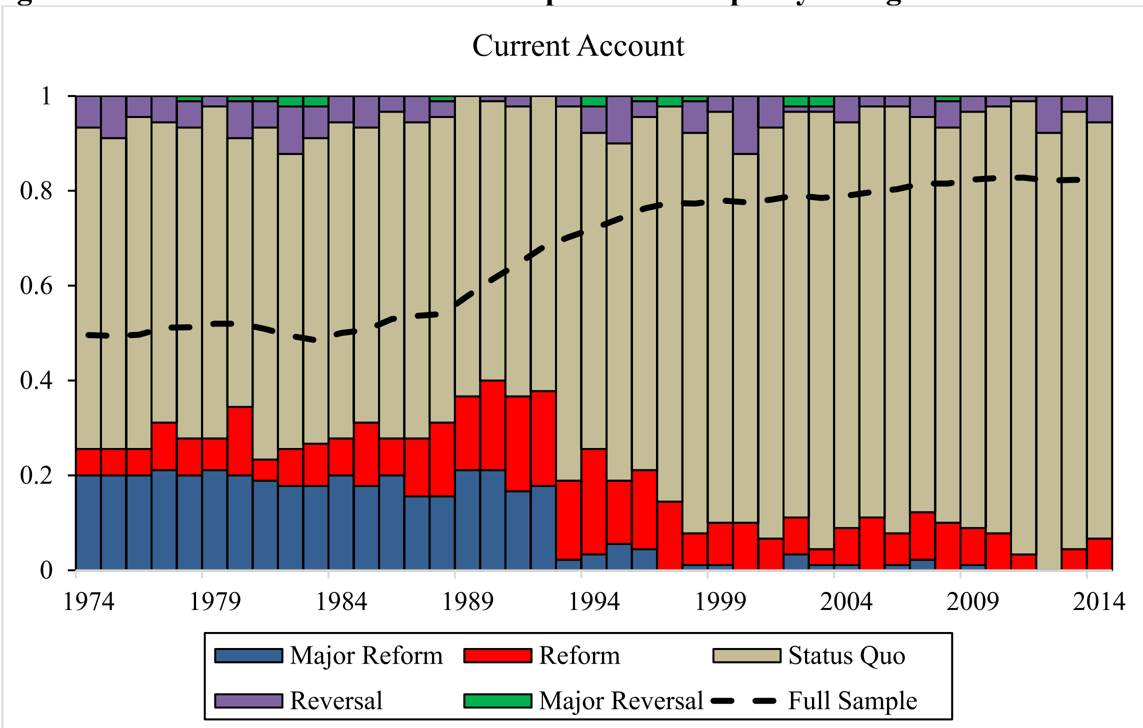


Figure 10. Distribution of current and capital account policy changes



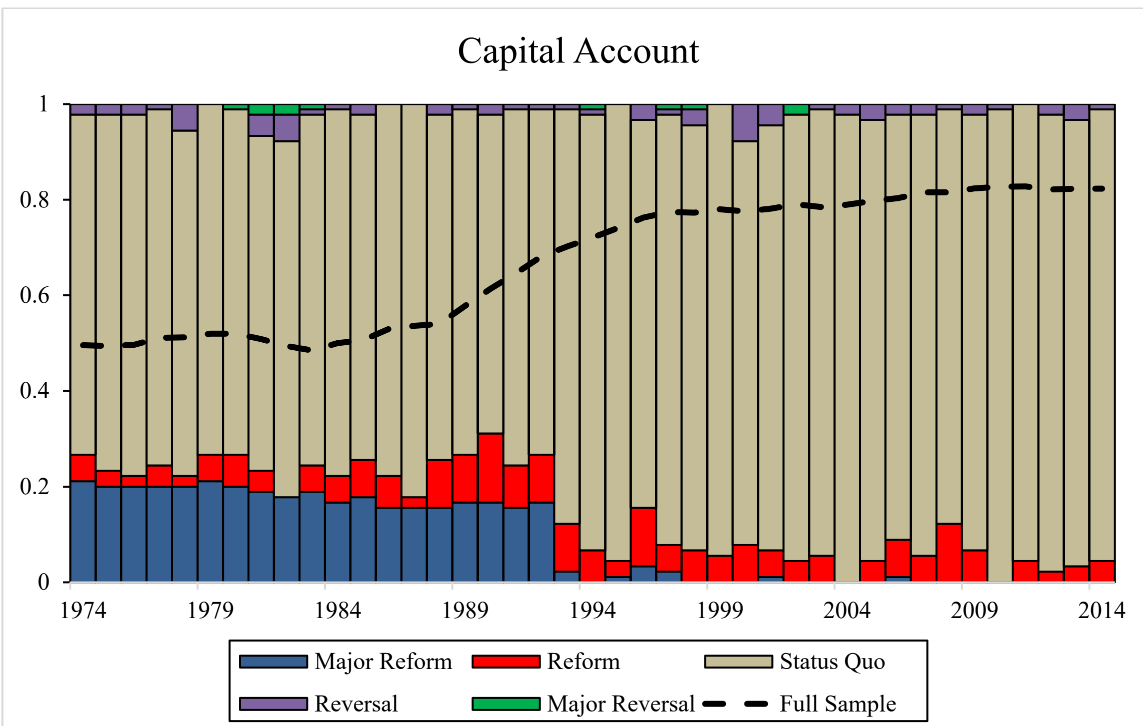
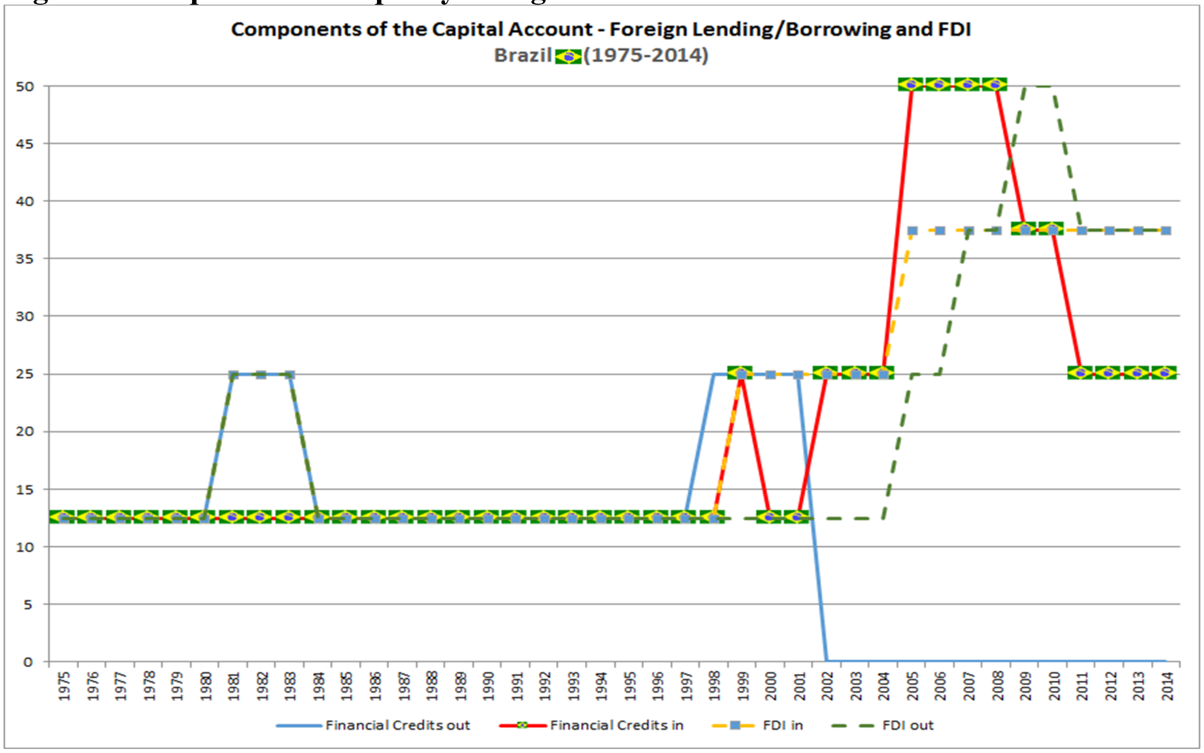


Figure 11. Capital account policy changes—case studies



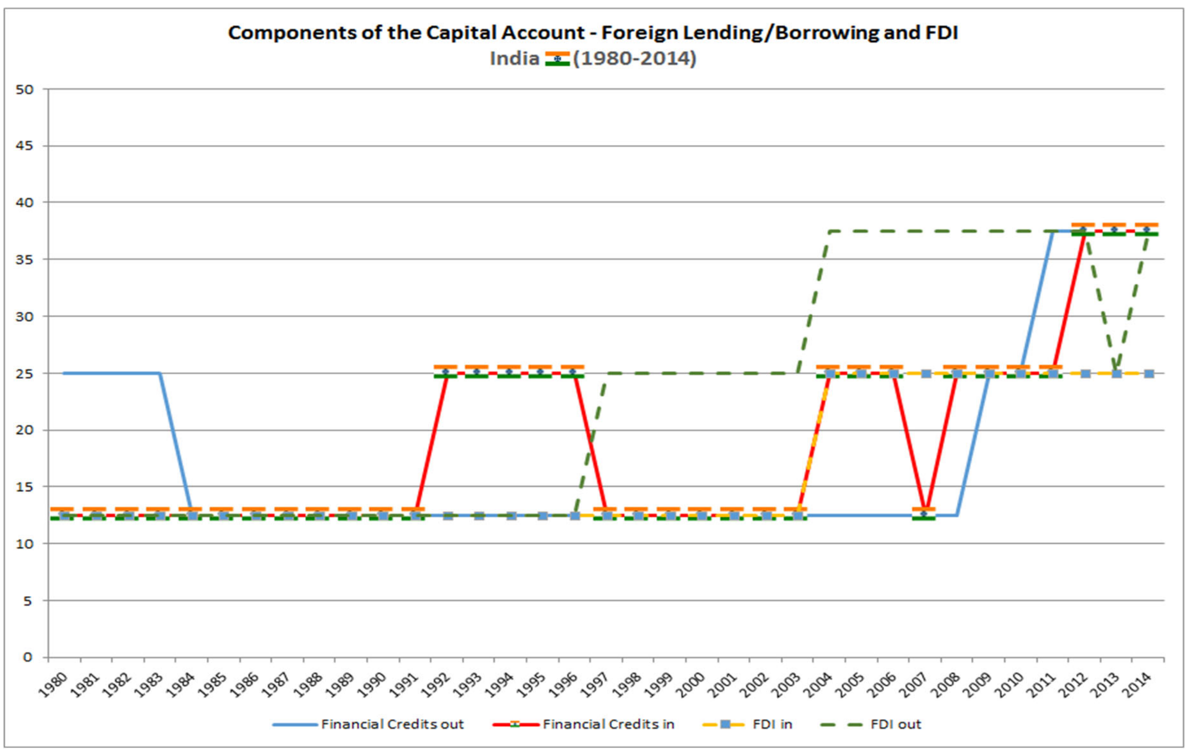


Figure 12. Financial indicator and sub-indicators

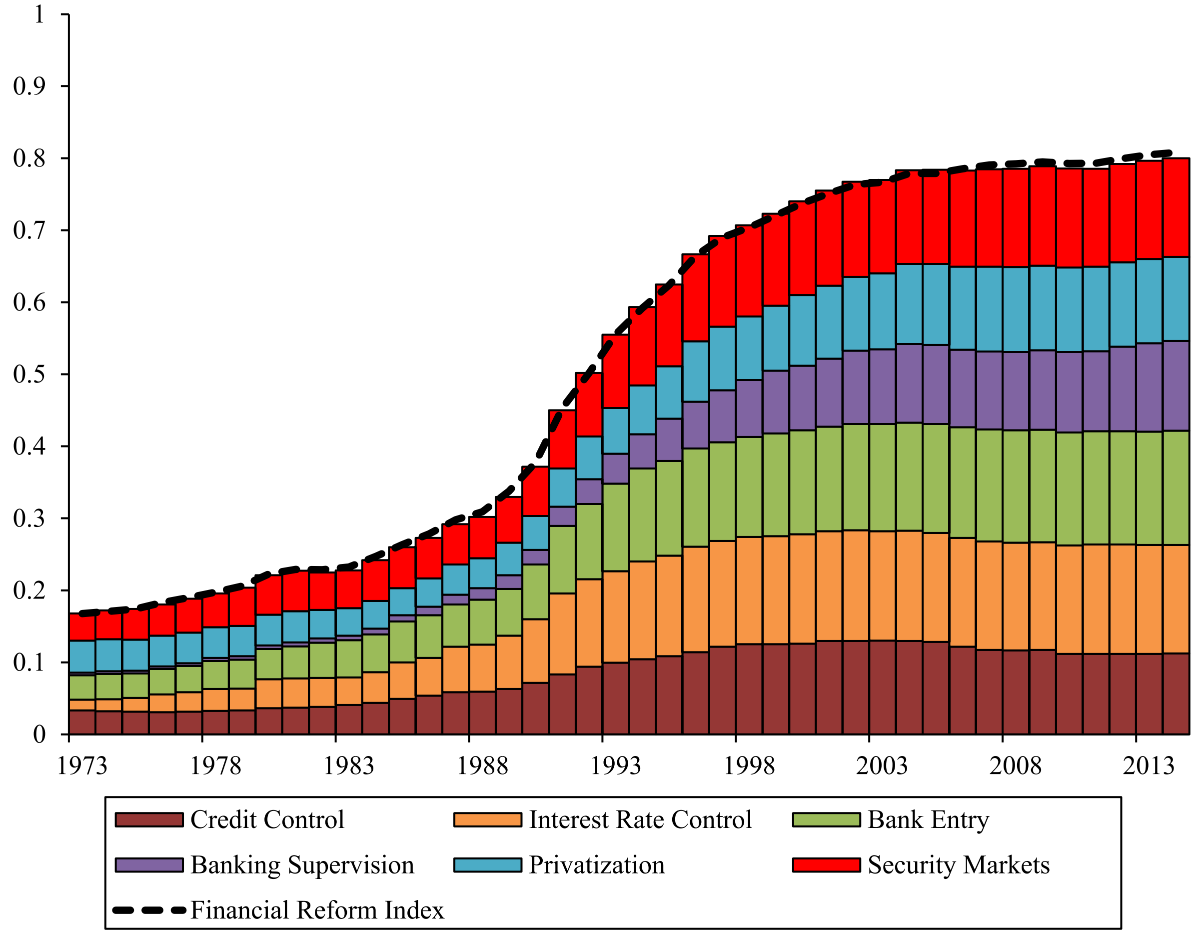


Figure 13. Financial indicator by economy

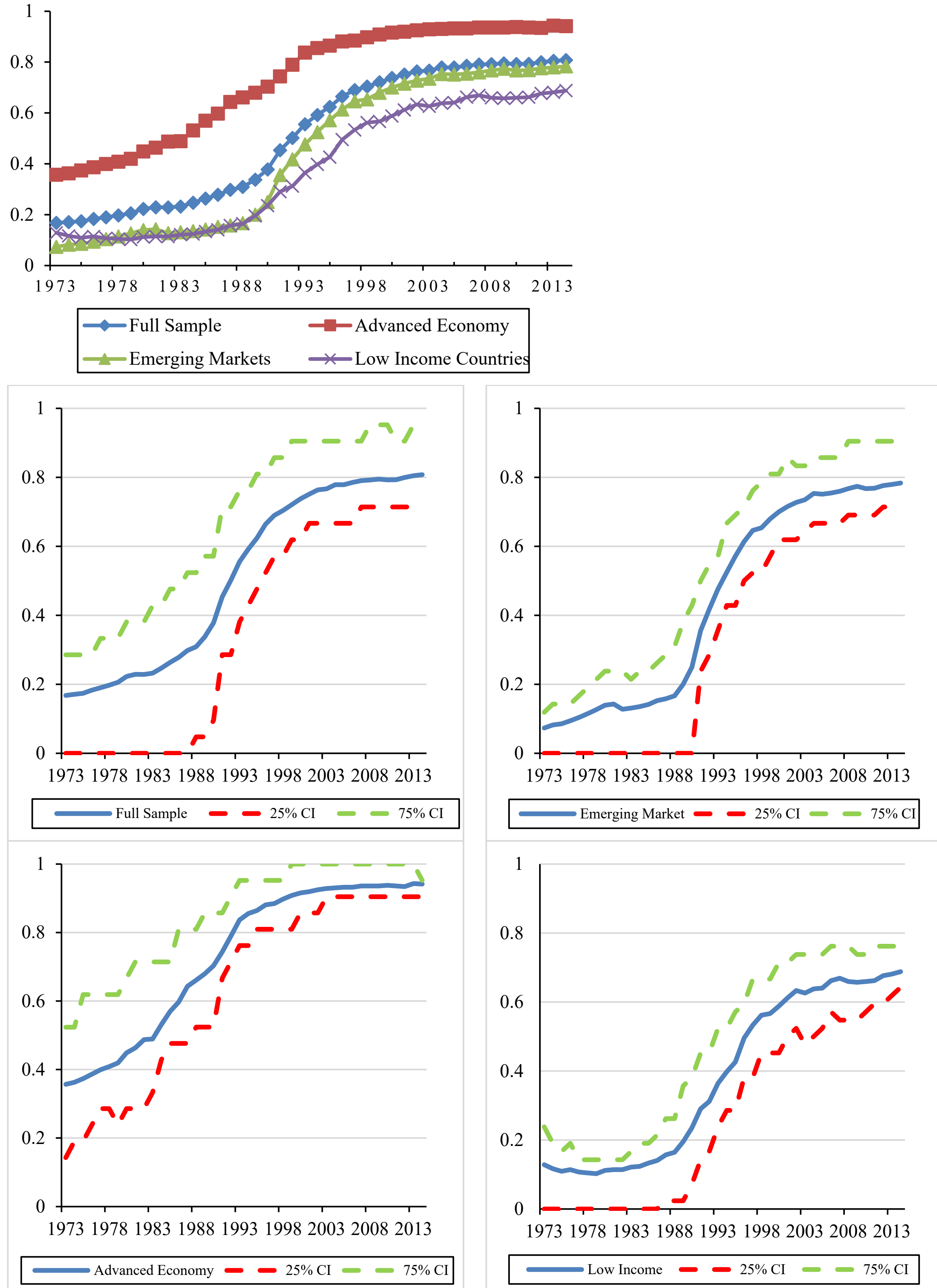


Figure 14. Financial sub-indicators by economy

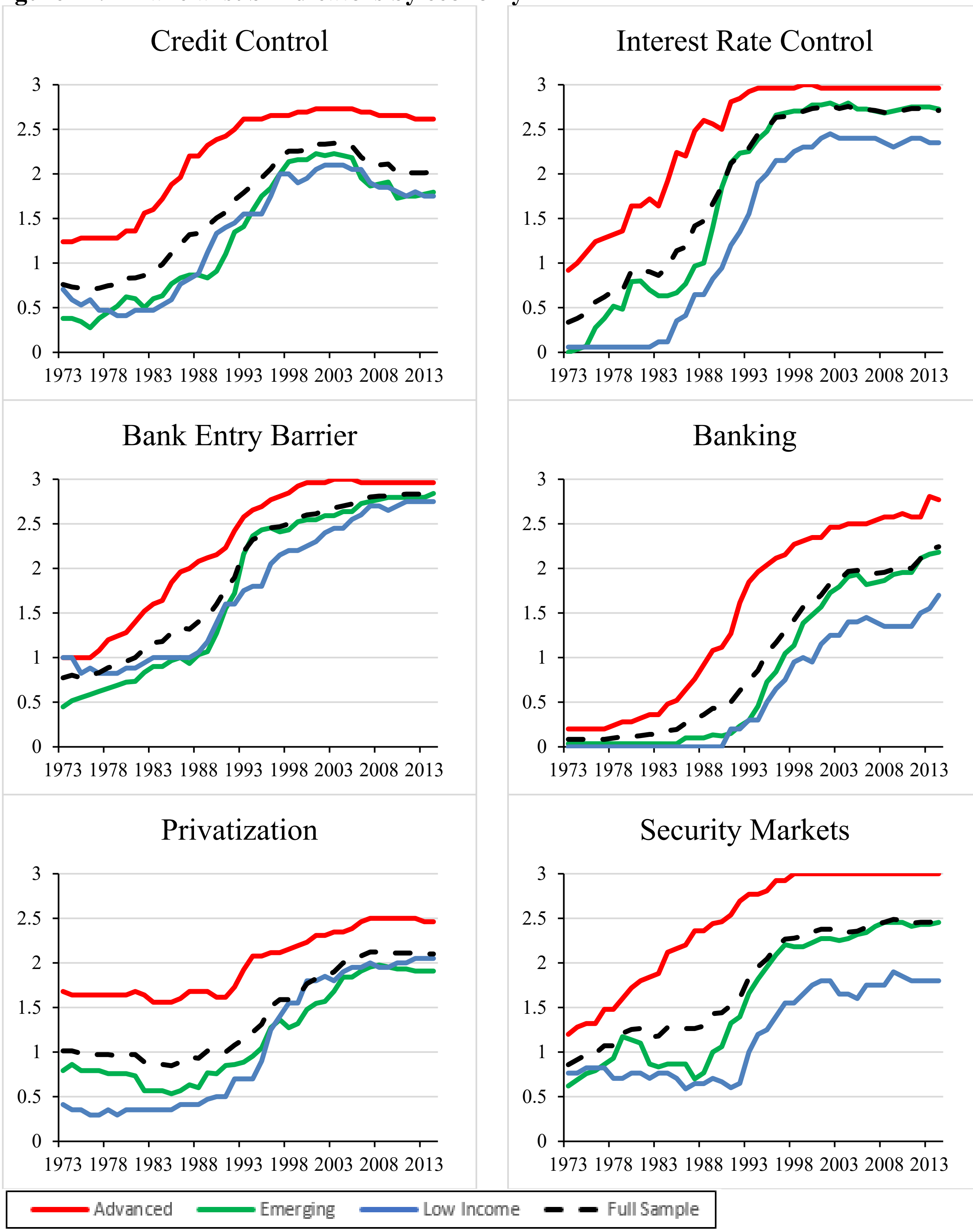


Figure 15. Financial indicator by region

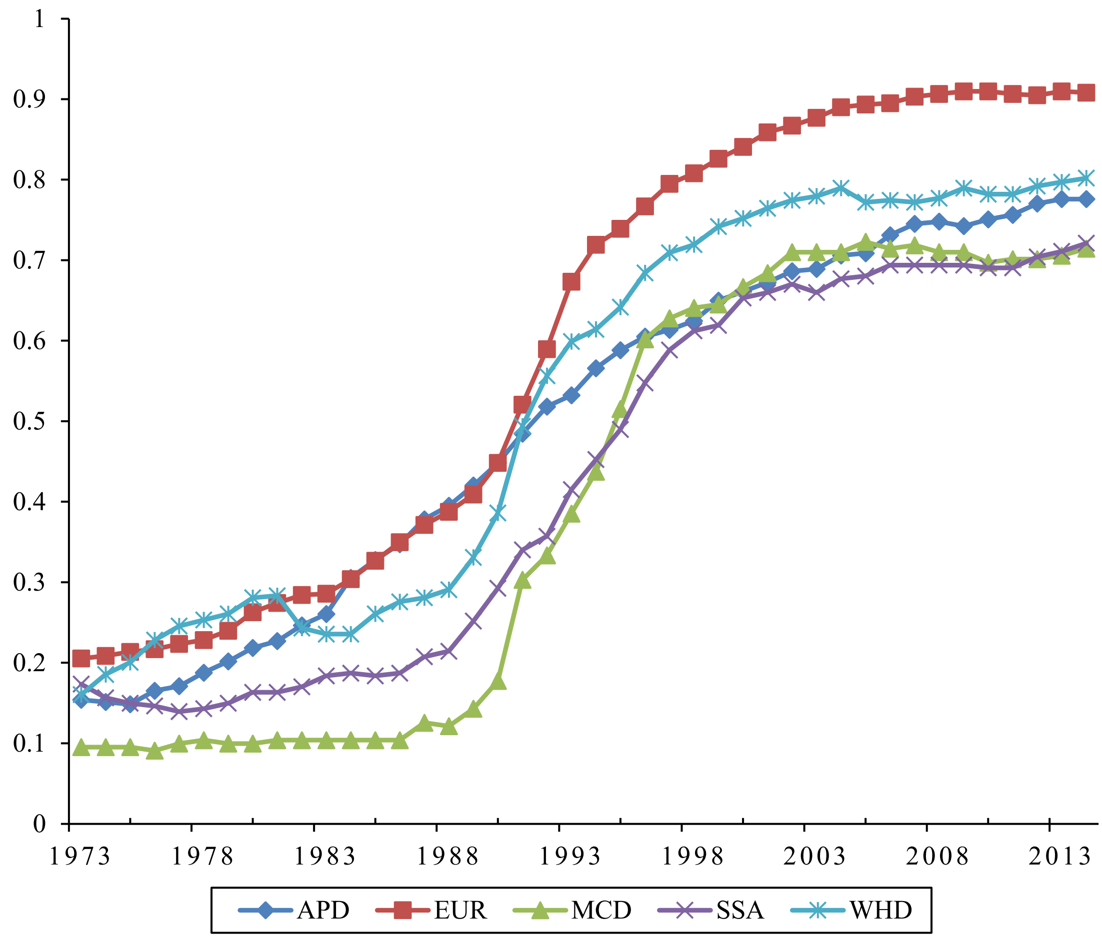


Figure 16. Distribution of financial policy changes, 1973-2014

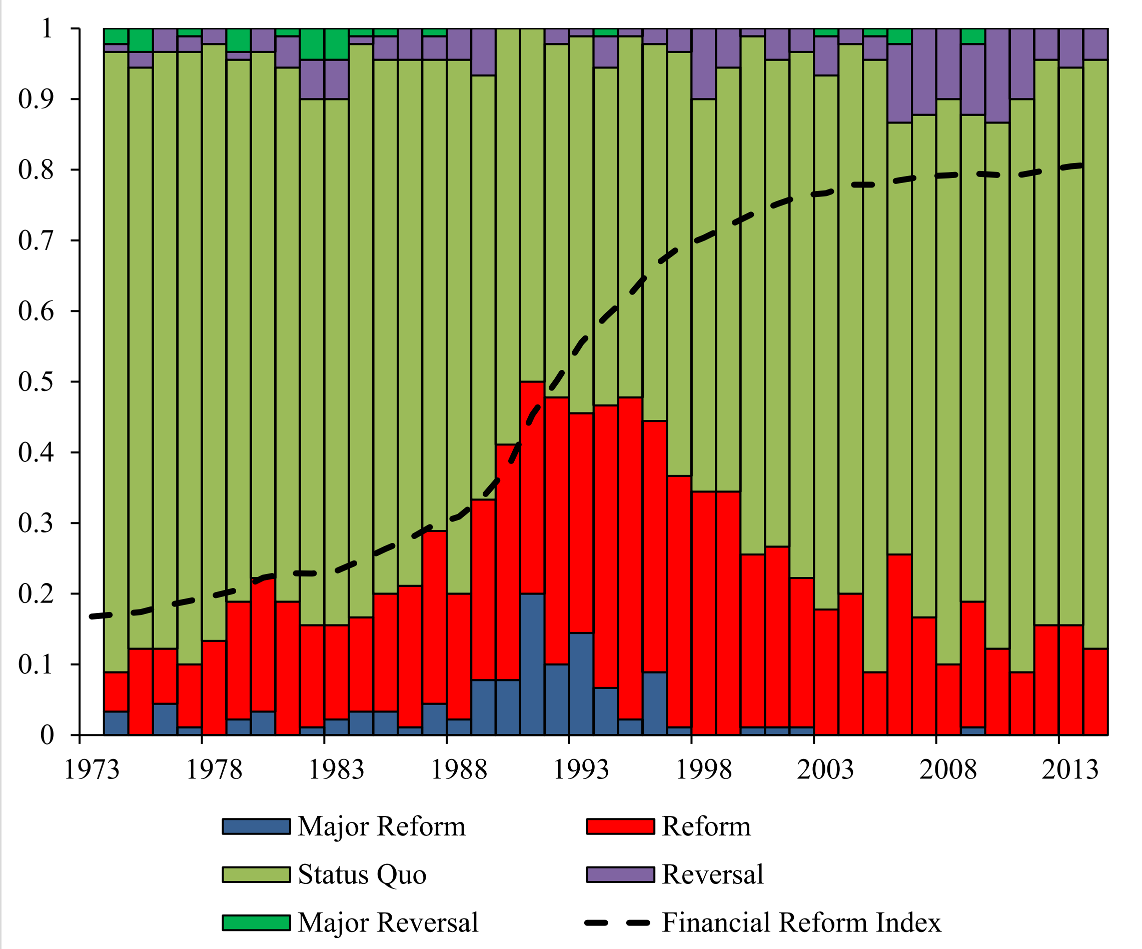


Figure 17. Case study for China and India

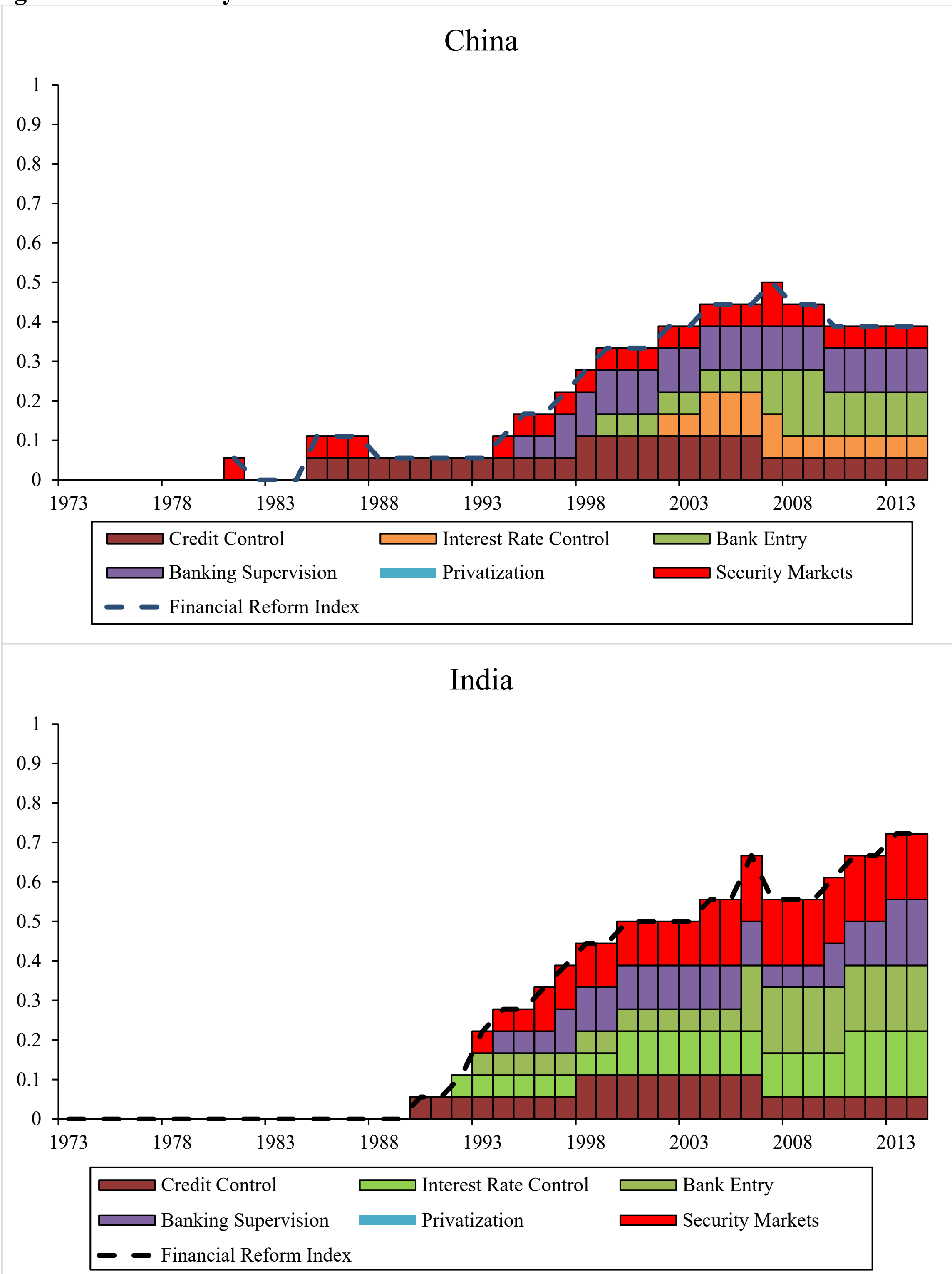


Figure 18. Product market index

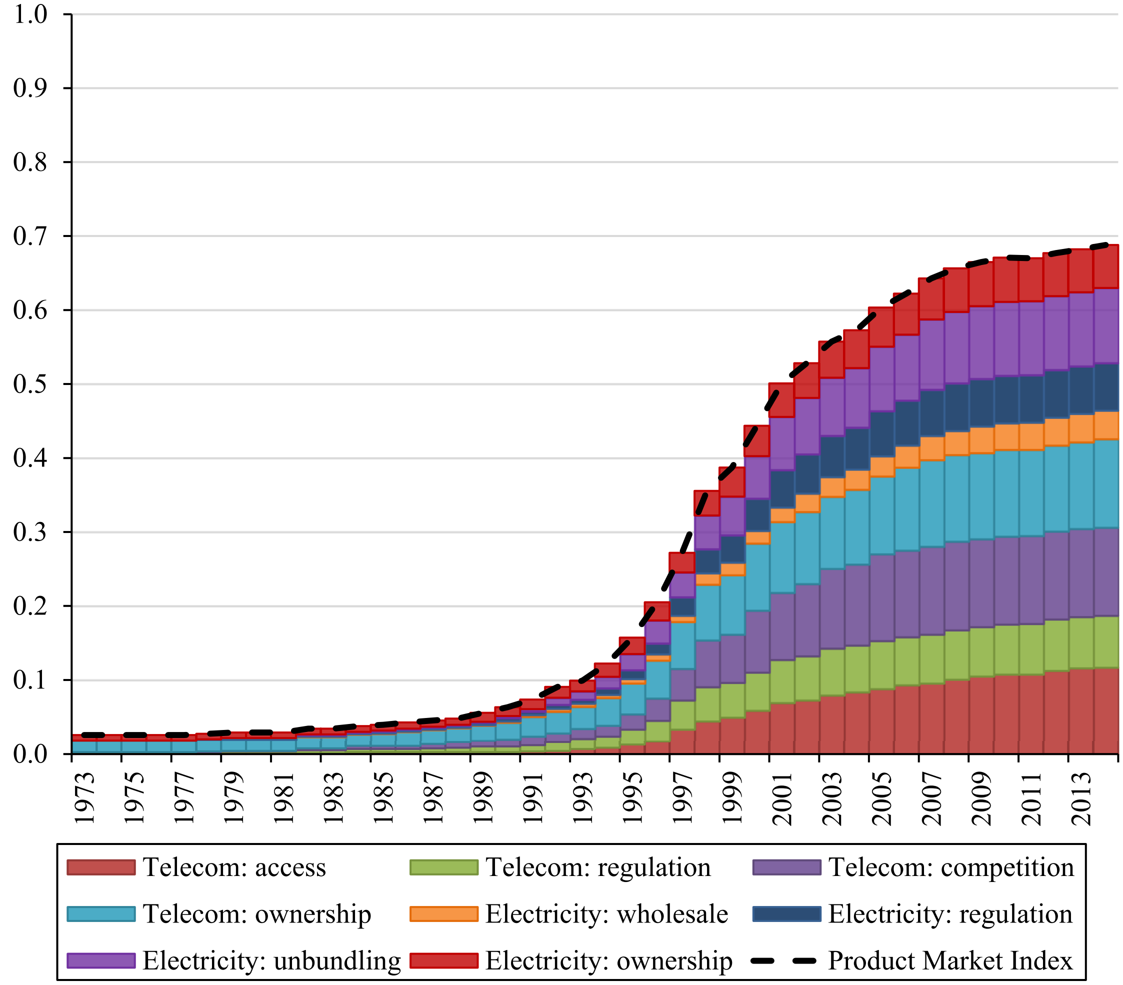


Figure 19. Product market index by income groups

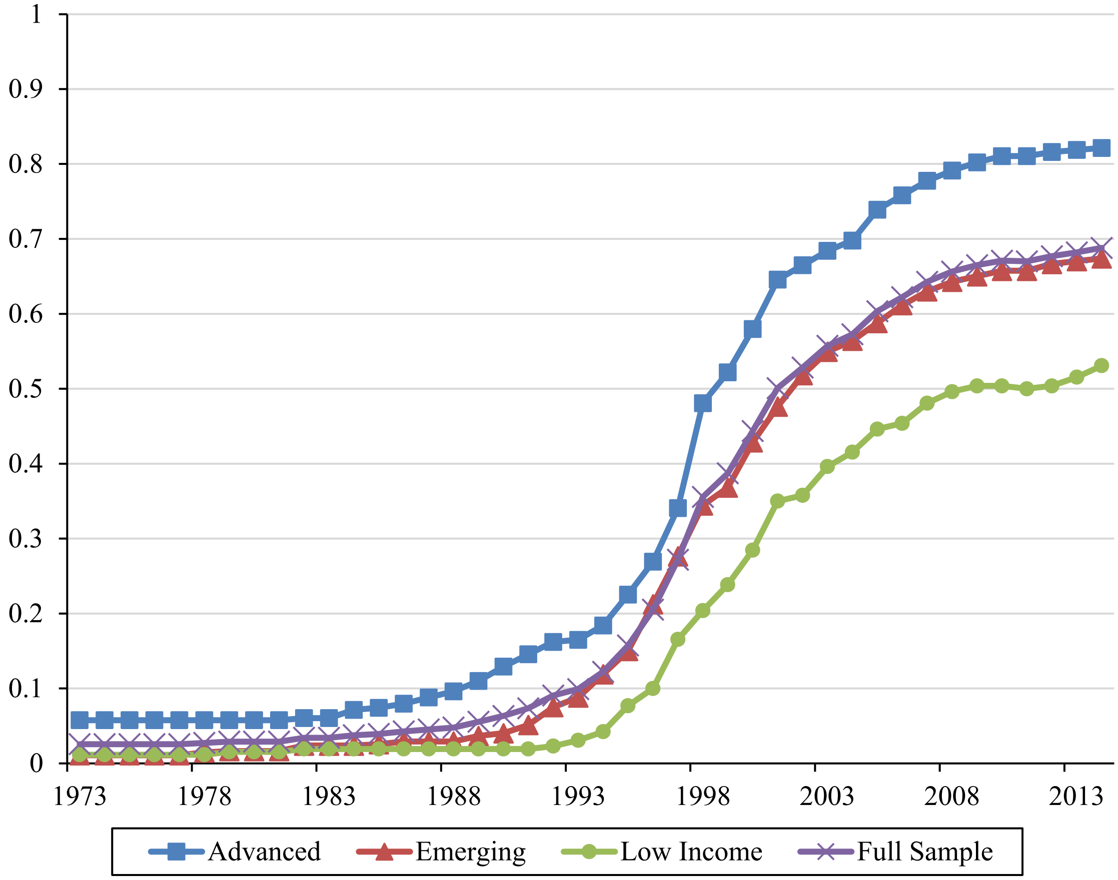


Figure 20. Product market index by region

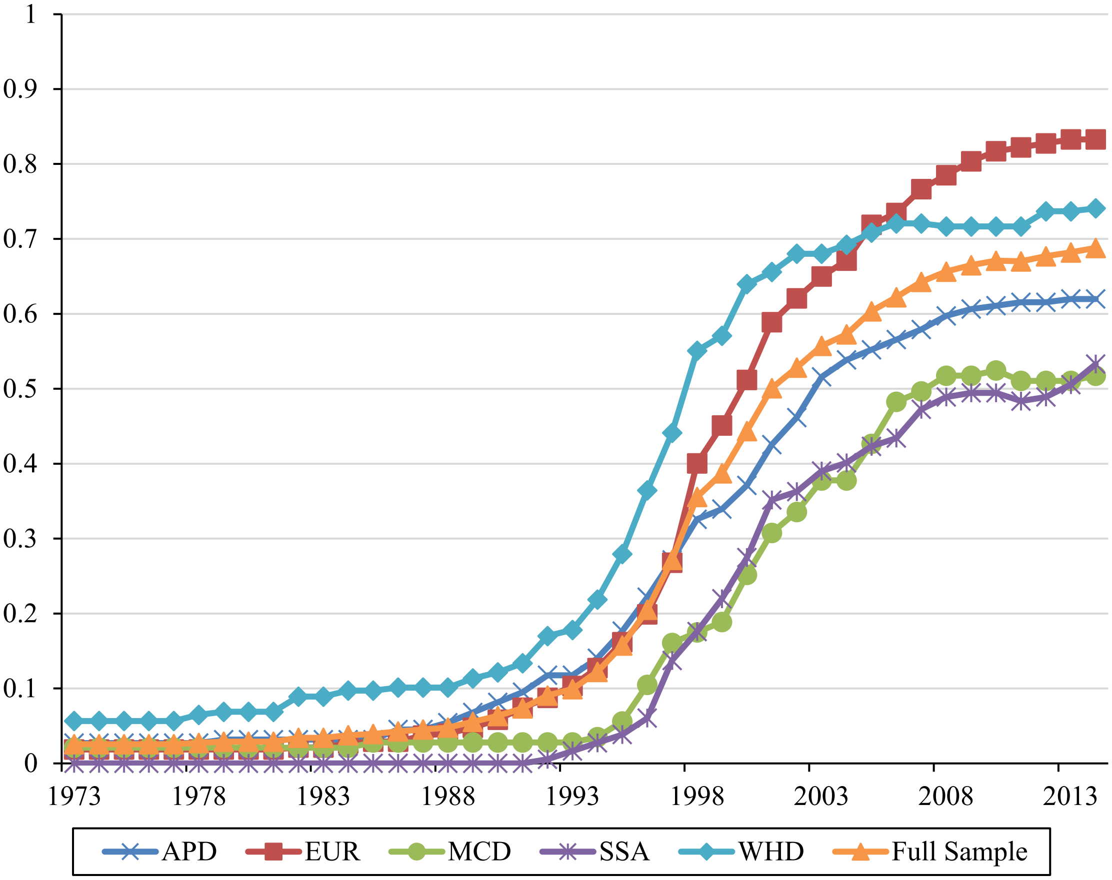


Figure 21. Product market index decomposition

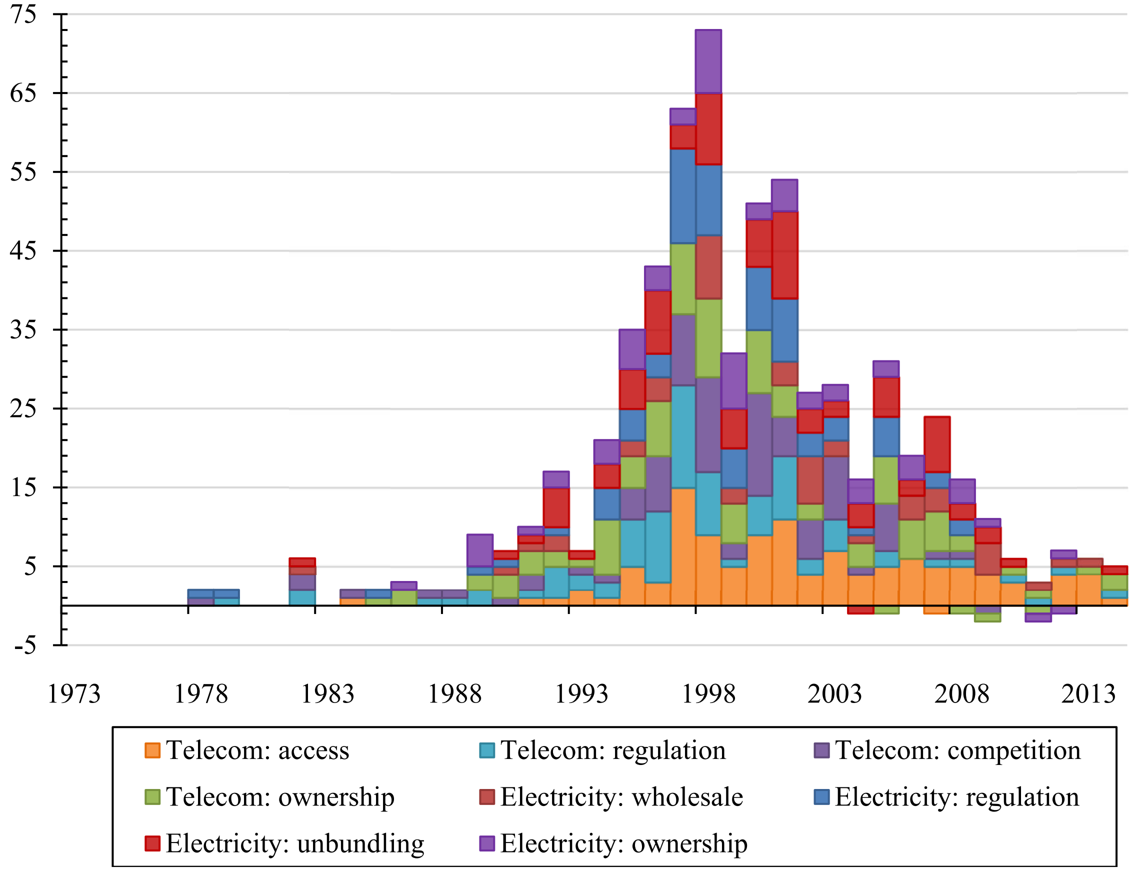


Figure 22. Product market reform—the case of India

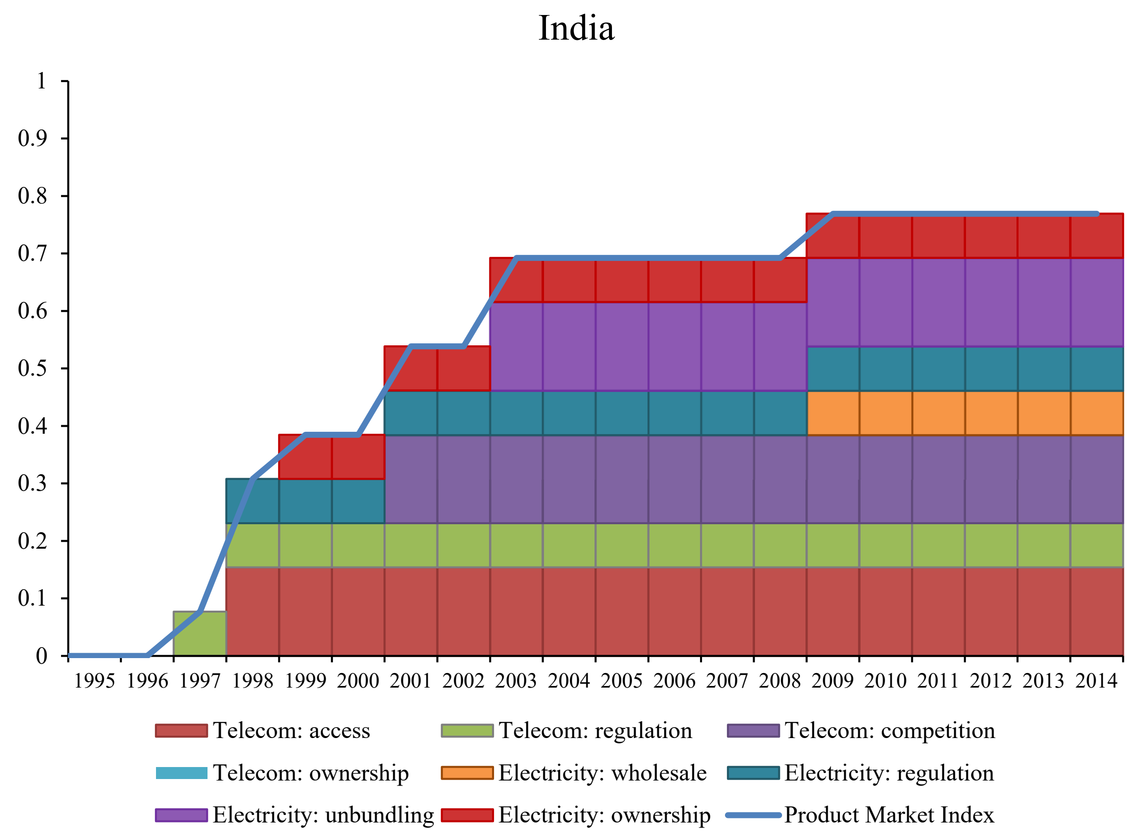


Figure 23. Labor market index and sub-indices

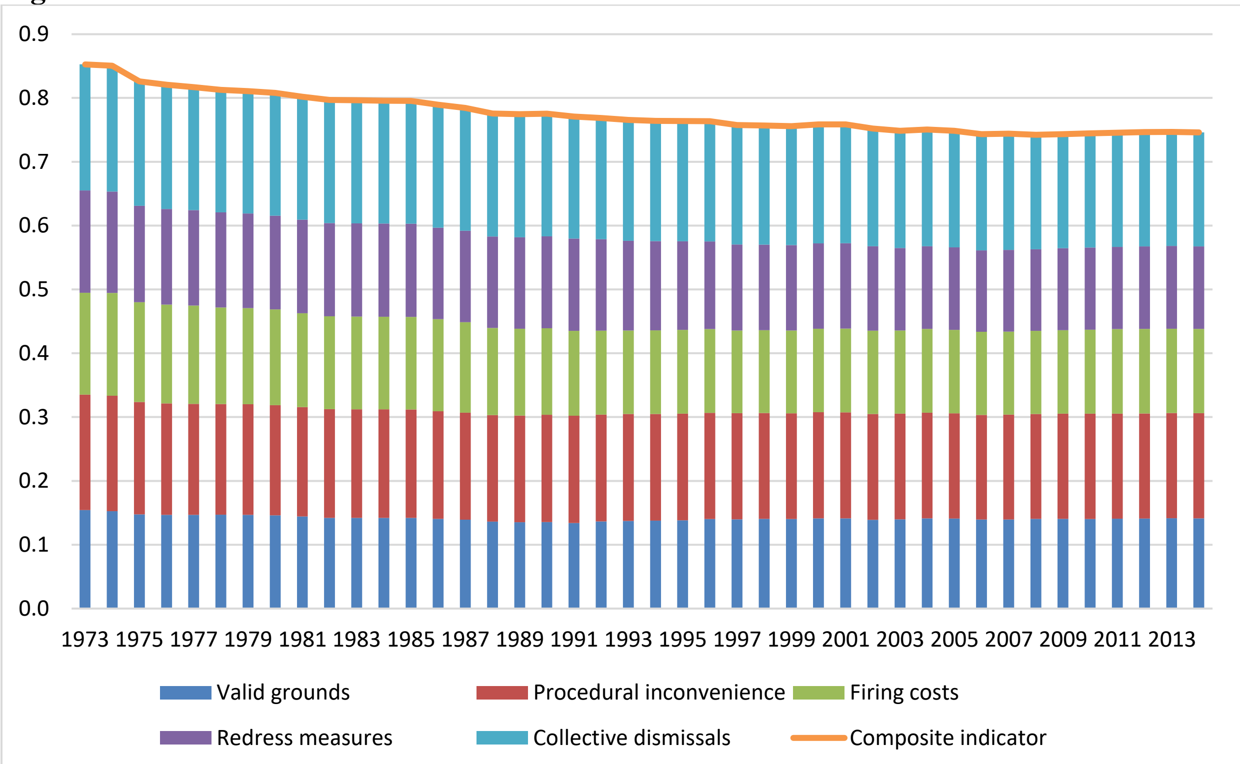


Figure 24. Labor market index by economy

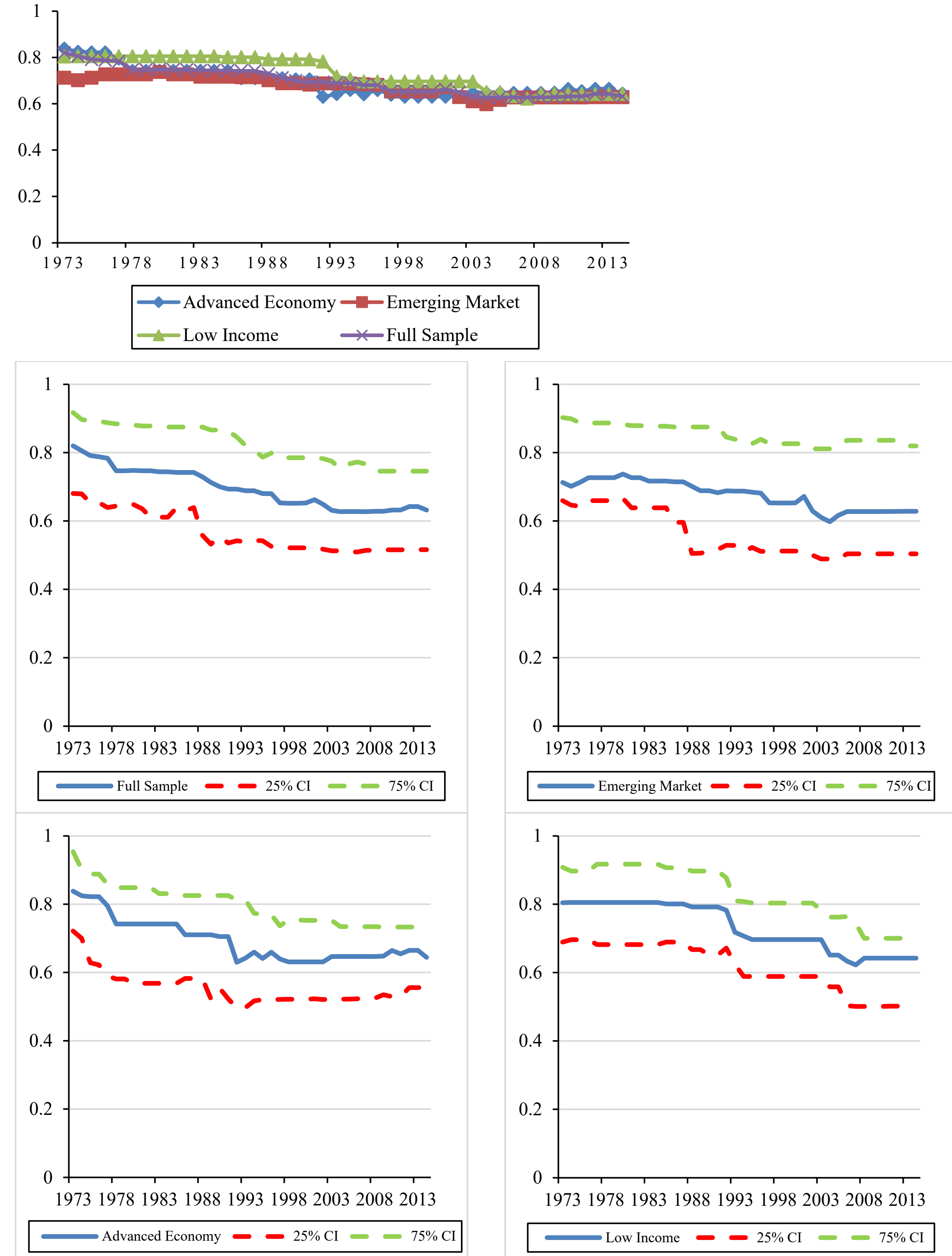
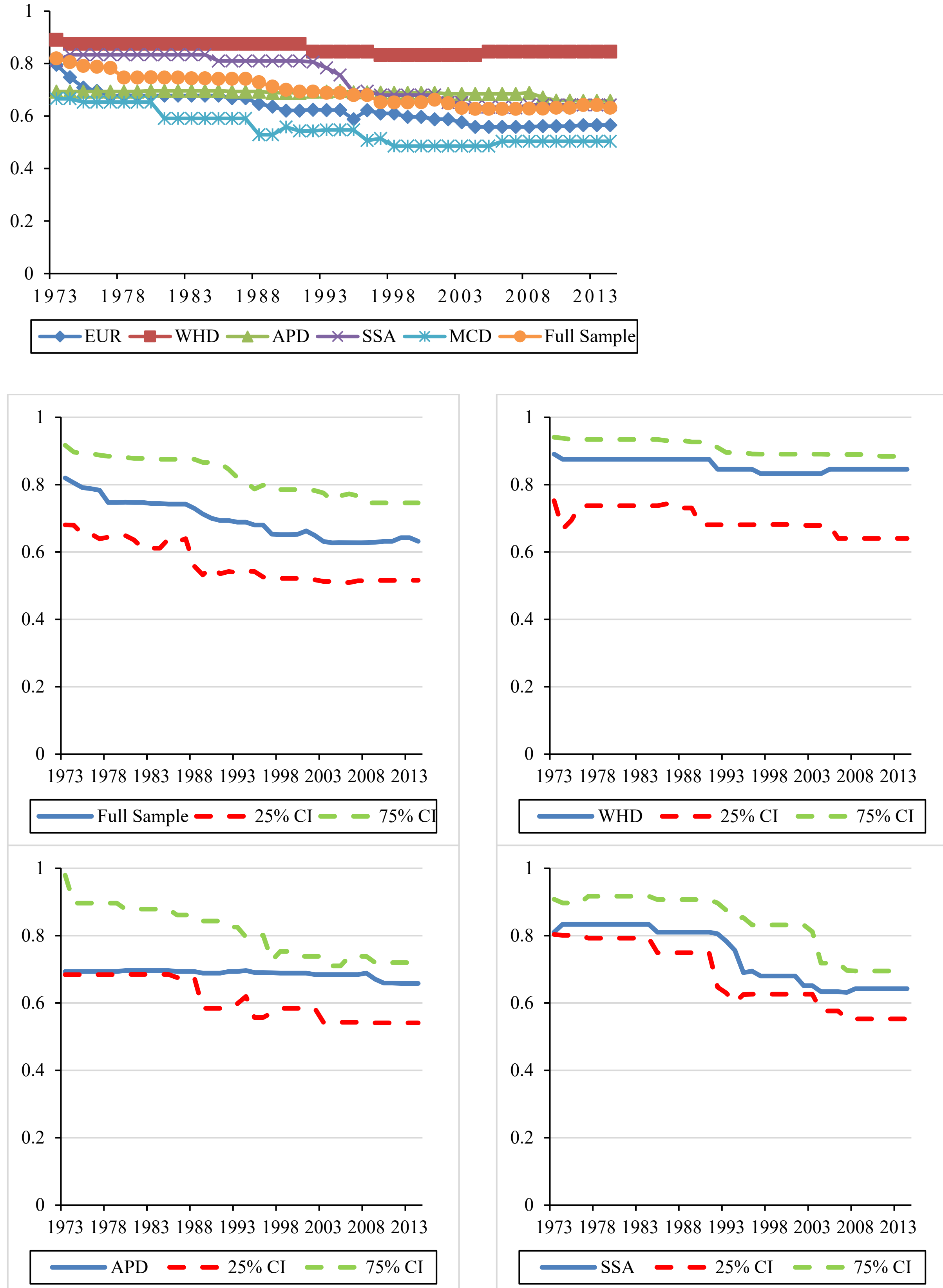
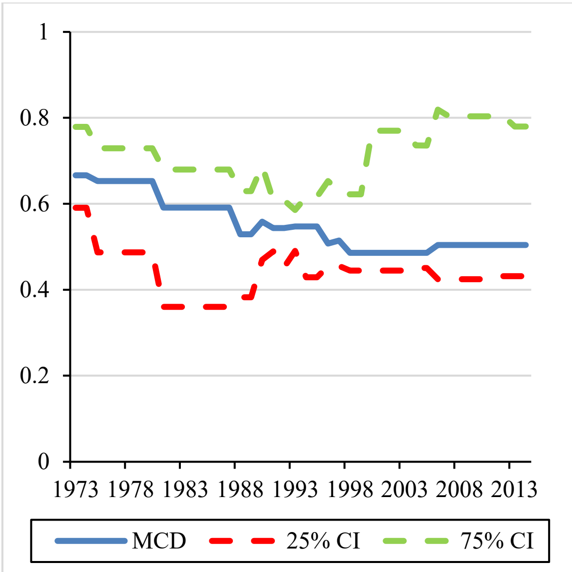


Figure 25. Labor market index by region




1
0.8
0.6
0.4
0.2
0
1973 1978 1983 1988 1993 1998 2003 2008 2013
MCD
25% CI
75% CI

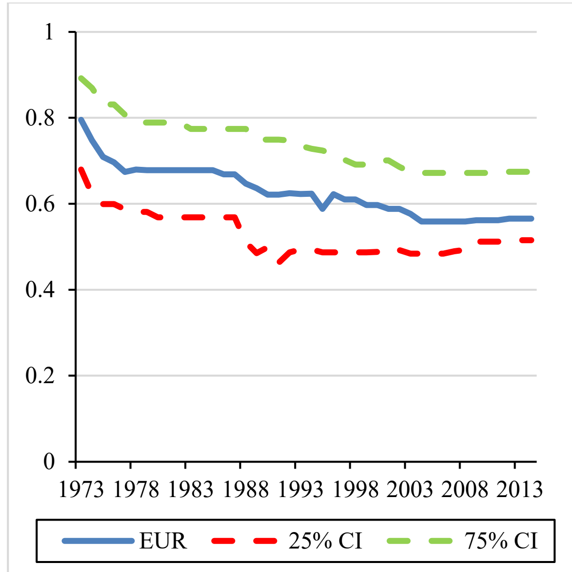

1
0.8
0.6
0.4
0.2
0
1973 1978 1983 1988 1993 1998 2003 2008 2013
EUR
25% CI
75% CI

Figure 26. Distribution of labor market policy changes, 1973-2014

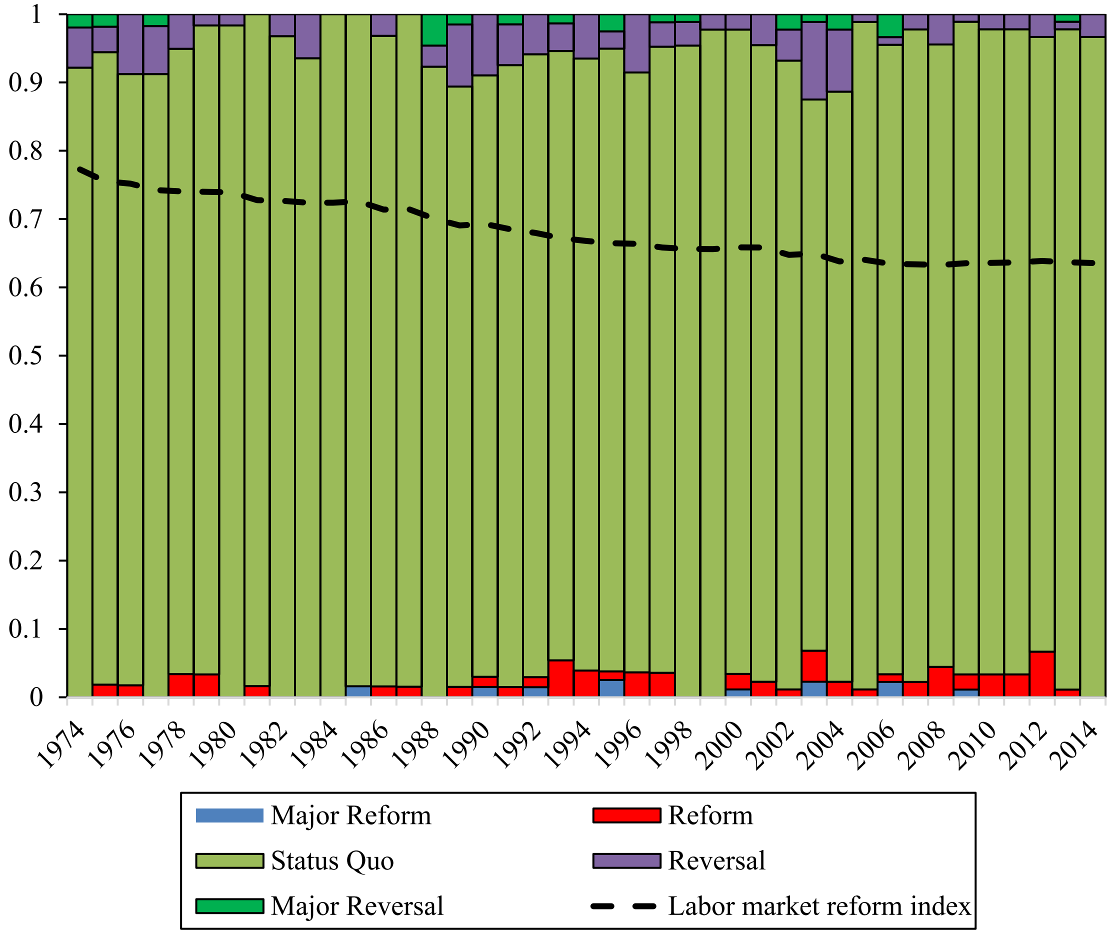


Figure 27. Case study for Vietnam and Georgia

V. TABLES

Table 1. Country list

Low-income countries (LICs)	Emerging market economies (EMs)		Advanced economies (AEs)
Bangladesh	China	Algeria	Australia
Nepal	India	Azerbaijan	Hong Kong SAR
Vietnam	Indonesia	Egypt	Japan
Kyrgyz Republic	Malaysia	Georgia	Korea
Uzbekistan	Pakistan	Jordan	New Zealand
Burkina Faso	Philippines	Kazakhstan	Singapore
Cameroon	Sri Lanka	Morocco	Austria
Cote D'Ivoire	Thailand	Tunisia	Belgium
Ethiopia	Albania	Argentina	Czech Republic
Ghana	Belarus	Bolivia	Denmark
Kenya	Bulgaria	Brazil	Finland
Madagascar	Estonia	Chile	France
Mozambique	Hungary	Colombia	Germany
Nigeria	Latvia	Costa Rica	Greece
Senegal	Lithuania	Dominican Republic	Ireland
Tanzania	Poland	Ecuador	Italy
Uganda	Romania	El Salvador	Netherlands
Zimbabwe	Russia	Guatemala	Norway
Nicaragua	Turkey	Jamaica	Portugal
	Ukraine	Mexico	Spain
	South Africa	Paraguay	Sweden
		Peru	Switzerland
		Uruguay	United Kingdom
		Venezuela	Israel
			Canada
			United States

Table 2. Data gaps (the number in the cell represents the first year with observations)

Country	Trade	External Finance	Domestic Finance	Product Market	Labor Market	Country	Trade	External Finance	Domestic Finance	Product Market	Labor Market
Albania	1997	1991	1991	1973	1981	Kazakhstan	1996	1992	1991	1991	1991
Algeria	1973	1973	1973	1973	1973	Kenya	1990	1973	1973	1973	1973
Argentina	1984	1973	1973	1973	1973	Korea	1973	1973	1973	1973	1973
Australia	1973	1973	1973	1973	1973	Kyrgyz Republic	1995	1992	1991	1991	1991
Austria	1975	1973	1973	1973	1973	Latvia	1992	1992	1992	1973	1973
Azerbaijan	2002	1992	1991	1991	1997	Lithuania	1992	1992	1992	1973	1973
Bangladesh	1984	1973	1973	1973	1973	Madagascar	1995	1973	1973	1973	1973
Belarus	1996	1992	1992	1991	1993	Malaysia	1976	1973	1973	1973	1973
Belgium	1988	1973	1973	1973	1973	Mexico	1973	1973	1973	1973	1973
Bolivia	1974	1973	1973	1973	1973	Morocco	1985	1973	1973	1973	1973
Brazil	1973	1973	1973	1973	1973	Mozambique	1994	1983	1975	1975	1975
Bulgaria	1997	1990	1991	1973	1993	Nepal	1984	1973	1973	1973	1992
Burkina Faso	1978	1973	1973	1973	1973	Netherlands	1973	1973	1973	1973	1973
Cameroon	1986	1973	1973	1973	1973	New Zealand	1973	1973	1973	1973	1973
Canada	1989	1973	1973	1973	1973	Nicaragua	1985	1973	1973	1973	1973
Chile	1974	1973	1973	1973	1973	Nigeria	1988	1973	1973	1973	1973
China	1986	1973	1980	1973	1987	Norway	1973	1973	1973	1973	1973
Colombia	1975	1973	1973	1973	1973	Pakistan	1973	1973	1973	1973	1973
Costa Rica	1985	1973	1973	1973	1973	Paraguay	1974	1973	1973	1973	1973
Côte d'Ivoire	1978	1973	1973	1973	1973	Peru	1974	1973	1973	1973	1973
Czech Republic	1996	1993	1993	1993	1993	Philippines	1974	1973	1973	1973	1973
Denmark	1973	1973	1973	1973	1973	Poland	1988	1985	1990	1973	1975
Dominican Republic	1996	1973	1973	1973	1973	Portugal	1986	1973	1973	1973	1973
Ecuador	1975	1973	1973	1973	1973	Romania	1988	1973	1990	1973	1973
Egypt	1982	1973	1973	1973	1973	Russia	1993	1992	1993	1973	1973
El Salvador	1987	1973	1973	1973	1973	Senegal	1978	1973	1973	1973	1973
Estonia	1992	1992	1991	1973	1973	Singapore	1975	1973	1973	1973	1973
Ethiopia	1995	1973	1973	1973	1973	South Africa	1985	1973	1973	1973	1973
Finland	1973	1973	1973	1973	1973	Spain	1986	1973	1973	1973	1973
France	1973	1973	1973	1973	1973	Sri Lanka	1983	1973	1973	1973	1973
Georgia	1999	1992	1991	1991	1991	Sweden	1978	1973	1973	1973	1973
Germany	1973	1973	1973	1973	1973	Switzerland	1978	1973	1973	1973	1973
Ghana	1973	1973	1973	1973	1973	Tanzania	1976	1973	1973	1973	1973
Greece	1974	1973	1973	1973	1973	Thailand	1973	1973	1973	1973	1973
Guatemala	1987	1973	1973	1973	1973	Tunisia	1973	1973	1973	1973	1973
Hong Kong SAR	1988	1973	1973	1973	1973	Turkey	1986	1973	1973	1973	1973
Hungary	1988	1981	1990	1973	1993	Uganda	1994	1973	1973	1973	1973
India	1985	1973	1973	1973	1973	Ukraine	1995	1992	1991	1991	1991
Indonesia	1976	1973	1973	1973	1973	United Kingdom	1973	1973	1973	1973	1973
Ireland	1973	1973	1973	1973	1973	United States	1978	1973	1973	1973	1973
Israel	1975	1973	1973	1973	1973	Uruguay	1973	1973	1973	1973	1973
Italy	1973	1973	1973	1973	1973	Uzbekistan	2001	1992	1991	1991	1994
Jamaica	1979	1973	1973	1973	1973	Venezuela	1977	1973	1973	1973	1973
Japan	1978	1973	1973	1973	1973	Vietnam	1994	1973	1990	1973	1973
Jordan	1983	1973	1973	1973	1996	Zimbabwe	1996	1979	1973	1973	1973

Table 3. Summary of major changes in the structural reform indexes

Definition 1: More than two standard deviations of the annual changes of the indexes over the full sample.

	Trade	External Finance	Domestic Finance	Product Market	Labor Market
Major changes (# of obs.)	139	91	305	213	96
of which: reforms	106	68	264	208	23
of which: reversals	33	23	41	5	73
Share in the sample	5.0%	2.7%	9.1%	6.0%	2.8%
of which: reforms	3.8%	2.0%	7.9%	5.9%	0.7%
of which: reversals	1.2%	0.7%	1.2%	0.1%	2.1%
Threshold	0.0999	0.1262	0.0949	0.1006	0.0681
No changes (# of obs.)	698	3,068	2,446	3,049	3,094
Total (# of obs.)	2,808	3,390	3,353	3,542	3,425

Definition 2: More than two standard deviations of the annual changes of the indexes over the non-AE sample.

	Trade	External Finance	Domestic Finance	Product Market	Labor Market
Major changes (# of obs.)	112	91	305	213	93
of which: reforms	88	68	264	208	22
of which: reversals	24	23	41	5	71
Share in the sample	4.0%	2.7%	9.1%	6.0%	2.7%
of which: reforms	3.1%	2.0%	7.9%	5.9%	0.6%
of which: reversals	0.9%	0.7%	1.2%	0.1%	2.1%
Threshold	0.1056	0.1397	0.1001	0.0975	0.0716
No changes (# of obs.)	698	3,068	2,446	3,049	3,094
Total (# of obs.)	2,808	3,390	3,353	3,542	3,425

Definition 3: More than the 75th percentile of the absolute annual changes of the indexes over the full sample.

	Trade	External Finance	Domestic Finance	Product Market	Labor Market
Major changes (# of obs.)	702	322	806	493	331
of which: reforms	487	239	679	485	106
of which: reversals	215	83	127	8	225
Share in the sample	25.0%	9.5%	24.0%	13.9%	9.7%
of which: reforms	17.3%	7.1%	20.3%	13.7%	3.1%
of which: reversals	7.7%	2.4%	3.8%	0.2%	6.6%
Threshold	0.0203	0	0.0556	0	0
No changes (# of obs.)	698	3,068	2,446	3,049	3,094
Total (# of obs.)	2,808	3,390	3,353	3,542	3,425

Table 4. Summary statistics for the tariff indicator

Variable	Mean	Std. Dev.	Min	Max
Average Tariff	0.8	0.2	0.0	1.0
Weighted Tariff	0.8	0.2	0.0	1.0

Table 5. Distribution of reforms by periods for the tariff indicator (%)

	Full sample	1970s	1980s	1990s	2000s
Major reform	28.4	67.2	46.7	21.7	6.1
Reform	3.0	0.6	2.0	6.1	1.8
Status quo	27.3	1.7	12.7	21.9	50.7
Reversal	17.0	3.2	8.1	16.0	29.2
Major Reversal	24.4	27.4	30.6	34.3	12.2
Total	100.0	100.0	100.0	100.0	100.0

Table 6. Summary statistics for the current and capital account indicators
Panel A. Current account

	Mean	Std. Dev.	Min	Max
Restrictions on payments for imports	1.4	0.6	0.0	2.0
Restrictions on payments for services imports	1.4	0.6	0.0	2.0
Restrictions on goods exports receipts	1.2	0.7	0.0	2.0
Restrictions on services export receipts	1.4	0.7	0.0	2.0

Panel B. Capital account

	Mean	Std. Dev.	Min	Max
Restrictions on capital exports	1.2	0.7	0.0	2.0
Restrictions on capital imports	1.3	0.6	0.0	2.0

Table 7. Correlations among sub-indices for the current and capital account indicators

Panel A: Sub-indices in level: current account

	Restrictions on payments for goods imports	Restrictions on payments for services imports	Restrictions on goods export receipts	Restrictions on services export receipts
Restrictions on payments for imports	1.0			
Restrictions on payments for services imports	0.7***	1.0		
Restrictions on goods exports receipts	0.8***	0.8***	1.0	
Restrictions on services export receipts	0.7***	0.8***	0.8***	1.0

Panel B: Sub-indices in change: current account

	Restrictions on payments for goods imports	Restrictions on payments for services imports	Restrictions on goods export receipts	Restrictions on services export receipts
Restrictions on payments for imports	1.0			
Restrictions on payments for services imports	0.2***	1.0		
Restrictions on goods exports receipts	0.3***	0.3***	1.0	
Restrictions on services export receipts	0.2***	0.3***	0.5***	1.0

Panel C: Sub-indices in level: capital account

	Restrictions on capital exports	Restrictions on capital imports
Restrictions on capital exports	1.0	
Restrictions on capital imports	0.8***	1.0

Panel D: Sub-indices in change: capital account

	Restrictions on capital exports	Restrictions on capital imports
Restrictions on capital exports	1.0	
Restrictions on capital imports	0.4***	1.0

Table 8. Distribution of reforms by periods for the current and capital account indicators

Panel A: Current account

	Full Sample	1970s	1980s	1990s	2000s
Major Reform	2.7	1.6	3.2	5.2	2.0
Reform	9.7	8.0	11.6	14.5	7.0
Status Quo	82.0	83.3	77.7	76.0	86.0
Reversal	4.5	7.0	5.3	3.5	4.1
Major Reversal	1.0	0.4	2.1	0.8	0.9
Total	100.0	100.0	100.0	100.0	100.0

Panel B: Capital account

	Full Sample	1970s	1980s	1990s	2000s
Major Reform	2.0	1.0	2.1	3.8	1.4
Reform	4.9	4.0	5.5	6.7	4.7
Status Quo	90.5	90.9	89.4	87.8	91.0
Reversal	2.0	3.4	1.9	1.3	2.1
Major Reversal	0.7	0.8	1.1	0.6	0.8
Total	100.0	100.0	100.0	100.0	100.0

Table 9. Correlation of capital account indicators with other databases

Levels

	Capital	KA	Kaopen
Capital	1		
KA	0.84***	1	
Kaopen	0.85***	0.81***	1

Changes

	Capital	KA	Kaopen
Capital	1		
KA	0.26***	1	
Kaopen	0.19***	0.14***	1

Notes: KA is from Schindler 2009, updated in Fernandez et al., 2016. Kaopen is from Chinn and Ito 2008, updated.

Levels

	Capital_in	KAI	Capital_out	KAO
Capital_in	1			
KAI	0.75***	1		
Capital_out	0.82***	0.77***	1	
KAO	0.75***	0.85***	0.82***	1

Changes

	Capital_in	KAI	Capital_out	KAO
Capital_in	1			
KAI	0.19***	1		
Capital_out	0.4***	0.18***	1	
KAO	0.19***	0.51***	0.2***	1

Notes: KAI (inflows) and KAO (outflows) is from Schindler 2009, updated in Fernandez et al., 2016.

Table 10. Summary statistics for the domestic financial indicator

	Mean	Std. Dev	Min	Max
Credit controls	1.7	1.1	0.0	3.0
Interest rate controls	2.0	1.3	0.0	3.0
Entry barriers	2.0	1.2	0.0	3.0
Banking Supervision	1.1	1.1	0.0	3.0
Privatization	1.1	1.2	0.0	3.0
Security Markets	1.7	1.1	0.0	3.0

Table 11. Correlations among sub-indices for the domestic financial indicator

Panel A: Sub-indices in level

	Credit controls	Interest rate controls	Entry barriers	Banking supervision	Privatization	Security markets
Credit controls	1.0					
Interest rate controls	0.6***	1.0				
Entry barriers	0.6***	0.6***	1.0			
Banking supervision	0.6***	0.6***	0.6***	1.0		
Privatization	0.5***	0.5***	0.5***	0.5***	1.0	
Security markets	0.6***	0.7***	0.6***	0.7***	0.5***	1.0

Panel B: Sub-indices in change

	Credit controls	Interest rate controls	Entry barriers	Banking supervision	Privatization	Security markets
Credit controls	1.0					
Interest rate controls	0.1***	1.0				
Entry barriers	0.0	0.0*	1.0			
Banking supervision	0.0*	0.0	0.1***	1.0		
Privatization	0.0	0.0*	0.0	0.0	1.0	
Security markets	0.1***	0.1***	0.1***	0.0	0.0	1.0

Table 12. Correlation of the domestic financial index by aggregation methods

	SUM	PCA	Sum of Squares	Sum of Sqrts
SUM	1.0			
PCA	1.0***	1.0		
Sum of Squares	1.0***	1.0***	1.0	
Sum of Sqrts	1.0***	1.0***	1.0***	1.0

Note: The aggregation methods are respectively: summation over sub-indices (SUM); principle component aggregation (PCA); summation over sub-indices squared (Sum of Squares) and summation over the square roots of sub-indices (Sum of Sqrts).

Table 13. Distribution of reforms by periods for the domestic financial indicator

	Full Sample	1970s	1980s	1990s	2000s
Major Liberalization	3.1	1.7	2.9	8.3	0.3
Liberalization	18.1	7.0	16.3	30.7	16.9
Status Quo	74.9	88.5	77.1	58.9	77.2
Tightening	3.4	1.7	2.6	2.0	5.1
Major Tightening	0.6	1.1	1.1	0.1	0.4
Total	100.0	100.0	100.0	100.0	100.0

Table 14. Summary statistics for the product market indicators

	Mean	Std. Dev.	Min	Max
Telecom: access	0.5	0.8	0.0	2.0
Telecom: regulation	0.6	0.5	0.0	1.0
Telecom: competition	1.4	0.9	0.0	2.0
Telecom: ownership	0.7	0.9	0.0	2.0
Electricity: wholesale	0.8	0.4	0.0	1.0
Electricity: regulation	0.7	0.5	0.0	1.0
Electricity: unbundling	1.5	0.8	0.0	2.0
Electricity: ownership	0.4	0.6	0.0	2.0

Table 15. Correlations among sub-indices for product market regulations

Panel A: Levels

	Telecom: access	Telecom: regulation	Telecom: competition	Telecom: ownership	Electricity: wholesale	Electricity: regulation	Electricity: unbundling	Electricity: Ownership
Telecom: access	1.0							
Telecom: regulation	0.7***	1.0						
Telecom: competition	0.6***	0.6***	1.0					
Telecom: ownership	0.6***	0.5***	0.6***	1.0				
Electricity: wholesale	0.5***	0.5***	0.6***	0.5***	1.0			
Electricity: regulation	0.6***	0.7***	0.6***	0.5***	0.5***	1.0		
Electricity: unbundling	0.5***	0.6***	0.6***	0.5***	0.7***	0.7***	1.0	
Electricity: ownership	0.4***	0.4***	0.5***	0.5***	0.5***	0.4***	0.5***	1.0

Panel B: Changes

	Telecom: access	Telecom: regulation	Telecom: competition	Telecom: ownership	Electricity: wholesale	Electricity: regulation	Electricity: unbundling	Electricity: ownership
Telecom: access	1.0							
Telecom: regulation	0.2***	1.0						
Telecom: competition	0.1***	0.1***	1.0					
Telecom: ownership	0.0*	0.0	0.1***	1.0				
Electricity: wholesale	0.0*	0.0*	0.0	0.0	1.0			
Electricity: regulation	0.1***	0.1***	0.0	0.1***	0.1***	1.0		
Electricity: unbundling	0.0	0.1***	0.0*	0.0	0.3***	0.2***	1.0	
Electricity: ownership	0.0	0.01	0.0	0.1***	0.1***	0.1**	0.1***	1.0

Table 16. Correlations across different methods of aggregation for the product market indicator

	Sum	PCA	Sum of Squares	Sum of Square Roots
Sum	1.0			
PCA	1.0***	1.0		
Sum of Squares	1.0***	1.0***	1.0	
Sum of Square Roots	1.0***	1.0***	1.0***	1.0

Table 17. Distribution of reforms by periods for the product market indicator

	Full Sample	1970s	1980s	1990s	2000s	2010s
Major Reforms	1.8	0.0	0.1	5.0	2.3	0.0
Reforms	11.3	0.6	2.3	18.4	22.1	6.0
Status Quo	86.7	99.4	97.6	76.6	75.0	93.3
Reversal	0.2	0.0	0.0	0.0	0.6	0.7
Total	100.0	100.0	100.0	100.0	100.0	100.0

Table 18. Comparison with OECD PMR Index
Panel A

	OECD: Electricity Entry	OECD: Electricity Public Ownership	OECD: Electricity Vertical Integration	OECD: Electricity Market Structure
Electricity: Wholesale	0.80***	0.38***	0.68***	0.64***
Electricity: Regulation	0.74***	0.36***	0.66***	0.45***
Electricity: Unbundling	0.80***	0.36***	0.77***	0.63***
Electricity: Ownership	0.50***	0.87***	0.39***	0.46***

Panel B

	OECD: Telecom Entry	OECD: Telecom Public Ownership	OECD: Telecom Market Structure
Telecom: Interconnection	0.80***	0.75***	0.82***
Telecom: Regulation	0.74***	0.63***	0.73***
Telecom: Monopoly	0.90***	0.71***	0.91***
Telecom: Ownership	0.81***	0.85***	0.80***

Table 19. Summary statistics for the labor market indicator

	Mean	Median	Standard deviation
Valid grounds	0.7	0.8	0.2
Procedural inconvenience	0.8	0.8	0.2
Firing costs	0.7	0.7	0.2
Redress measures	0.7	0.7	0.2
Collective dismissals	0.9	1.0	0.1

Table 20. Correlation among sub-indexes

Panel A: Levels

	Valid grounds	Procedural inconvenience	Firing costs	Redress measures	Collective dismissals
Valid grounds	1.0				
Procedural inconvenience	0.6***	1.0			
Firing costs	0.4***	0.2***	1.0		
Redress measures	0.4***	0.4***	0.2***	1.0	
Collective dismissals	-0.0	0.0**	0.1***	0.0	1.0

Panel B: Changes

	Valid grounds	Procedural inconvenience	Firing costs	Redress measures	Collective dismissals
Valid grounds	1.0				
Procedural inconvenience	0.6***	1.0			
Firing costs	0.4***	0.3***	1.0		
Redress measures	0.4***	0.4***	0.3***	1.0	
Collective dismissals	0.0	-0.0***	0.1***	0.1***	1.0

Table 21. Correlation of the labor market indicator across aggregation methods

	Simple average	Average of squares	Average of square roots	PCA
Average of squares	1.0			
Average of square roots	1.0	0.9		
PCA	1.0	1.0	1.0	
Average of raw sub-indexes	1.0	1.0	1.0	1.0

Table 22. Distribution of observations across the world by different decades for the labor market indicator

	Full sample	1970s	1980s	1990s	2000s
Major liberalizing reform	0.9	0.0	0.2	0.5	0.6
Liberalizing reform	1.9	1.8	0.6	2.2	2.5
Status quo	93.0	92.0	95.9	91.5	91.9
Tightening reform	3.5	5.3	2.7	5.1	4.2
Major tightening reform	1.1	0.9	0.6	0.8	0.9
Total	100.0	100.0	100.0	100.0	100.0

Table 23. Correlation with Botero et al. (2004) EPL indicators

	DPI	CFWI	Average	Common sample
AEs	0.92	0.38	0.91	27
EMs	0.76	0.20	0.64	34
LICs	0.29	0.73	0.26	12

Notes: Columns 2, 3 and 4 display correlation coefficients between the original indexes of Botero *et al.* (2004) and the replicas developed here. DPI and CFWI refer respectively to the Dismissal Procedure Index and the Cost of Firing Workers Index. Average refers to the simple average of the two indexes (both normalized to range between 0 and 1). Column 5 reports the size of the common sample between Botero *et al.* (2004) and the current analysis. AEs, EMs and LICs refer respectively to advanced economies, emerging markets and low-income countries. The CFWI is constructed excluding no reason dismissals.

Table 24. Correlation with OECD EPL indicators

	EPRC_v1	EPRC_v2	EPRC_v3	Common sample
AEs	0.80	0.86	0.82	153
EMs	0.48	0.78	0.75	82

Notes: Columns 2, 3 and 4 display listwise correlation coefficients between the original indexes of OECD (2013) and the replicas developed here. EPRC_v1, EPRC_v2, and EPRC_v3 refer respectively to the first, second and third version of the indexes of OECD (2013). Column 5 reports the size of common sample between what covered by the EPRC_v3 index of OECD (2013) and the current analysis. AEs and EMs refer respectively to advanced economies and emerging markets. OECD (2013) does not cover low-income countries.

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