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## IMF conditionality and structural reforms: Evidence from developing countries

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WIDER Working Paper 2023/97

## **IMF conditionality and structural reforms**

Evidence from developing countries

Ablam Estel Apeti<sup>1</sup> and Kwamivi Gomado<sup>2</sup>

August 2023

**Abstract:** The global economy, dominated by the consequences of a disastrous health crisis and international tensions, needs policy support to regain its growth dynamic. To regain an inclusive and sustainable growth dynamic, structural policies of governments are needed to allow a reallocation of resources and to stimulate productivity. International cooperation seems to be necessary, and the International Monetary Fund's (IMF) contribution could play an important role in promoting reforms. Indeed, in IMF-supported programmes, the conditions for developing countries' transition to liberalization and open markets are often common. In this paper, we address the question of whether periods of IMF conditionality contribute to the promotion of structural reforms in developing countries. We combine a rich dataset on IMF conditionality and structural reforms covering 64 developing countries over the period 1980–2014. Through the entropy balancing method and alternative identification strategies, we show that IMF conditionality programmes promote structural reforms in developing countries. We show that the effect of IMF conditionality can vary depending on the type of conditionality, the type of reform, the time frame, the initial level of structural reforms, and can depend on some structural factors including the business cycle, the quality of fiscal and monetary policy, the level of development, and the quality of institutions. Furthermore, we show that IMF conditionality can have spillover effects on trading partners and that IMF conditionality programmes that are met tend to have a greater impact on structural reforms.

**Key words:** IMF conditionality, structural reforms, developing countries, initial conditions, entropy balancing

**JEL classification:** F33, F34, O24, O43

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## 1 Introduction

Since their creation in 1944, the Bretton Woods Institutions (BWI)<sup>1</sup> have always tried to promote structural reforms in countries in general and in particular in developing countries through conditional lending programmes. Indeed, BWI member countries with macroeconomic imbalance problems and financing needs must comply with certain economic (or social and legal) conditions, which in the IMF framework take the form of IMF programme conditionality. The aim of conditionality is to help countries resolve their financial and macroeconomic imbalances without resorting to measures that undermine national or international prosperity. In addition, conditionality is designed to preserve IMF resources by ensuring that a country's finances are strong enough to repay the loan, thus enabling other countries to use the resources if needed in the future.<sup>2</sup> To meet their obligations vis-à-vis the IMF and maintain their close ties with the institution to benefit from its role of lender of last resort, countries can engage in growth-promoting structural reforms to expand the tax base and generate sufficient fiscal resources to pay the IMF's loans. Starting from this initial intuition, this paper seeks to analyse whether the conditions attached to IMF loans are conducive to the implementation of structural reforms.

The IMF's conditionality programmes can influence structural reforms through various channels. The first direct channel is the 'carrot-and-stick'<sup>3</sup> effect of conditionality. Indeed, before a member country can receive credit tranches from the IMF, its government must meet certain conditions. According to the IMF, the conditions imposed are intended to contribute to liberalization, the reduction of public expenditure and inflation, and the privatization of public enterprises (Boockmann and Dreher 2003). Thus, successful implementation of the conditions can contribute to reforming the sectors of activity in the country receiving conditional loans.

In addition to this formal channel, the literature highlights the fact that an international financial institution (IFI) such as the IMF can indirectly influence national policies even without imposing conditions. First, when a country has financial difficulties and turns to the IMF, this triggers a series of negotiations between national actors and the IMF. According to Stallings (1992), these negotiations can raise awareness of the 'threats' of macroeconomic imbalances and thus lead national actors to adopt a different policy approach. During these negotiations, countries requesting loans can benefit from policy advice, which could assist national actors to implement market-oriented policies (Haggard and Webb 1994) or structural reforms.

Although the above discussions seem to point to the idea that the IMF's conditionality can encourage structural reforms, some authors in the literature have pointed out that conditionality could discourage the implementation of reforms (Khan 1990; Collier 2000; Easterly 2002). Indeed, conditionality is subject to a moral hazard problem. In order to remain eligible for IMF credit, member countries may deliberately refrain from reforming the economy (or reduce precautionary measures), thereby perpetuating inefficient structures or institutions (Easterly 2002). Conditions can also be circumvented through the recipient country's implementation of compensatory measures not included in the programme. This lack of government involvement can thus distract from the expected results of IMF conditions and thus contribute to a regression of economic freedom. Drawing on these discussions, we can argue that the effect of IMF conditions on structural reforms can be positive or negative, making the question more empirical than theoretical.

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<sup>1</sup> The World Bank (WB) and the International Monetary Fund (IMF).

<sup>2</sup> See <https://www.imf.org/en/About/Factsheets/Sheets/2023/IMF-Conditionality>

<sup>3</sup> Injection of hard currency and compliance with conditions to access the loan tranches.

The empirical literature on the role of IFIs in promoting market-oriented reforms is limited and the results are mixed. Kingstone and Young (2009) analyse the impact of IMF programmes on structural reforms (and sub-components) in 15 Latin American countries. Over the 1975–2003 period, the authors find that participation in IMF programmes contributes significantly to structural reforms. Specifically, the authors find that IMF programmes promote tax, trade, and capital account liberalization reforms as well as domestic financial reforms. One limitation of Kingstone and Young’s analysis is that it does not take into account IMF membership, thus posing a selection bias problem. To address this limitation, Biglaiser and DeRouen (2011) use the same sample analysis focusing on the period 1980–2003. Specifically, they focus on Standby Agreements (SBAs), the most commonly adopted IMF programme.<sup>4</sup> Their results suggest that IMF programmes have a positive and statistically significant effect only in trade reform models. Abiad and Mody (2005) find in a study of 35 developing countries over the period 1973–96 that during periods of IMF programmes, there is a movement toward reform. In a study of 77 rich and developing countries, Henisz et al. (2005) analyse the impact of the strength of coercive pressures from multilateral lenders on market-based reforms in the telecommunications and electricity sectors. Measuring the strength of coercive pressures as the ratio of the country’s level of borrowing from the World Bank and the IMF to the country’s gross domestic product (GDP), the authors find that over the period 1977–99, international coercive pressures increased the likelihood of majority privatization and regulatory separation.

However, other empirical evidence finds that IFIs discourage structural reforms. Dreher and Rupprecht (2007), through an analysis of a panel of 116 countries over the period 1970–2000, find that IMF programmes have a negative effect on the index of economic freedom. Brooks and Kurtz (2007) analyse the effect of past World Bank and International Monetary Fund (IMF) financial flows on levels of trade liberalization and capital account openness in 19 Latin American countries over the period 1985–99. The variables capturing past World Bank and IMF financial flows both have negative effects in the trade liberalization models, but only the variable capturing IMF financial flows is statistically significant. In the capital account liberalization models, none of the IFIs variables are statistically significant.

In this paper, we seek to analyse the effect of IMF programme conditionality on structural reforms. We make three contributions to the empirical literature. First, we examine the effect of conditionality on structural reforms using a new dataset. We consider five structural reforms: product market reforms, labour market reforms, domestic and external finance reforms, and trade reforms. The reform data are derived from Alesina et al.’s (2020) recent work. Indeed, alongside the study by Biglaiser and DeRouen (2011), our study is the first to focus on the impact of conditionality on the composition of structural reforms by distinguishing the effect of conditions by each sector of reforms. Our study differs from previous studies by focusing on policy and conditionality heterogeneity through a new dataset from Kentikelenis et al. (2016). This dataset has the advantage of providing more disaggregated information on conditions across time and countries. There is a categorization of conditions imposed on countries that want to borrow from IMF coffers. These categories of conditions include quantitative performance criteria, indicative benchmarks, prior actions, structural performance criteria, and structural benchmarks.<sup>5</sup> This categorization of conditions determines not only the relative weight that the IMF attaches to the implementation of the respective conditions imposed but also the degree of freedom that borrowing countries have (Kentikelenis et al. 2016).<sup>6</sup> Second, we take into account structural factors that could condition the impact of IMF programme conditionality on structural reforms, in particular the business cycle, the quality of fiscal and monetary policy, the level of development, and the quality of

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<sup>4</sup> These programmes generally cover a period of 12 to 18 months.

<sup>5</sup> See Section 3 on data description for a definition of each condition.

<sup>6</sup> When conditions are not implemented, this is likely to result in programme interruptions or delays in the disbursement of credit or non-credit tranches by the IMF.

institutions. Finally, our study distinguishes between the impact of programmes without conditions and the impact of successful conditionality programmes (conditions met).

The main result—which passes a set of robustness tests—of this study is that IMF conditions (conditionality) contribute to the promotion of structural reforms in developing countries. However, there is no statistical evidence that unconditional loans are effective in promoting structural reforms. Depending on the categorization of conditions and the dimensionality of reforms, our results reveal that ‘quantitative conditions’ promote trade, financial, and product market reforms. In contrast, ‘structural conditions’ promote only labour-market-oriented reforms. A much more disaggregated analysis shows that among the ‘quantitative conditions’, only the ‘quantitative performance criteria’ improve the implementation of the five reforms studied. However, among the ‘structural conditions’, the promotion of reforms is significantly ensured by the ‘structural benchmarks’ conditions. The heterogeneity tests performed subsequently show that the impact of conditions could vary according to the business cycle, fiscal or monetary stance, or income level of the country. Interestingly, the impact of conditions depends on institutional quality. Indeed, our estimates show that in countries with higher institutional quality, IMF conditions are effective in terms of implementing structural reforms, while in countries with low institutional quality, they are not. As for the dynamics of the effect of conditions on reforms, the results show that the effect of conditions is durable over time but loses intensity over time. This decrease in intensity over time could be described as ‘reform fatigue’ linked to electoral cycles (Bowen et al. 2016). Focusing on met vs. unmet conditions, our estimates reveal that the effect of conditions depends on the success of the conditions and the magnitude of the effect is larger for met conditions. Finally, using a quantile regression approach, we show that the effect of IMF conditionality may depend on the initial level of reforms in the country receiving the IMF loan.

The rest of the paper is structured as follows: Section 2 provides a brief overview of the importance of structural reforms and the role of IMF conditionality. Section 3 describes the main data used. Section 4 presents the estimation methodology. Section 5 presents the main results and Section 6 the robustness analyses. Section 8 concludes.

## 2 Structural reforms and IMF conditionality

This section provides a brief overview of the economic importance of structural reforms and the role of IMF conditionality.

Modern economies are characterized by competitive heterogeneity (product and service differentiation) that creates rent situations for certain economic agents. Indeed, these economic agents, by providing goods or services, obtain a higher remuneration than they would in an economy of pure and perfect competition. The existence of these rent situations can be explained by many factors: the existence of long-term relationships between economic agents for insurance reasons, the rigidity of prices (companies do not constantly revise prices for cost reasons), and wages. Moreover, the regulatory and institutional framework can be factors contributing to rent-seeking (or rent-raising). In the case of imperfect competition, the economic theory proposes the implementation of structural reforms to make the economy more competitive and more resistant to shocks, thus stimulating potential supply while reducing price and wage rigidity. Therefore, the implementation of reforms aims at redistributing market rents among economic agents. In the short run, reforms create winners and losers, but in the long run, they create more winners (Antipa et al. 2008).

There is a large empirical literature on the importance of market-oriented reforms in stimulating economic growth. Structural reforms play a role in stimulating economic growth by improving the business

climate to attract foreign direct investment, increasing trade to correct price distortions, and improving productivity through competition (Konte et al. 2022; Gomado 2022a, 2022b).

In its role as lender of last resort, the IMF's Articles of Agreement stipulate that countries that borrow from its coffers must have policies that are consistent with the Fund's objectives. To ensure that countries comply with these objectives, the IMF develops 'conditionality' which consists of making the granting of credit conditional on the implementation of specific programmes or policies. Thus, since the creation of the IMF, the use of conditionality in the programmes recommended to borrowing countries has grown steadily over the years, and the number of conditions imposed has not stopped increasing. Theoretically, the literature identifies five major objectives of IMF loan conditionality (Dreher 2009).

First, conditionality aims to induce borrowing countries to pursue reforms that they would not have chosen without the granting of credit, specifically, reforms to combat corruption. Indeed, according to the IMF, conditionality is an important way to preserve its resources. Thus, to ensure that it will be repaid, the IMF as a lender attaches conditions to its loans (Khan 2001; Dreher 2009).

Second, conditionality in the IMF sense serves as an instrument of commitment to avoid problems of time inconsistency insofar as conditions are intended to provide credibility. In other words, the role of conditionality is to make future policy changes in borrowing countries more difficult. In countries with high levels of external indebtedness, governments are disinterested in reform efforts, believing that the gains from reforms would largely be passed on to creditors while the costs are borne by the indebted countries. Thus, to prevent and avoid the decline in debt repayments, IMF conditionality would allow countries to pursue reform efforts (Sachs 1989; Diwan and Rodrik 1992; Fafchamps 1996).

Third, conditionality is used to reveal the type or nature of the borrowing government. Indeed, for more productive outcomes, it can be argued that the IMF is more likely to provide funds to countries whose governments are competent in implementing good economic policies. Borrowing countries are generally characterized by asymmetric information environments, so conditionality can serve as an instrument to address the adverse selection problem. According to Nichols and Zeckhauser (1982), the imposition of conditions ensures that only governments that truly need IMF financing will use it.

Fourth, IMF loans can be seen as income insurance against negative shocks (Vaubel 1983). From this perspective, IMF conditionality would solve the moral hazard problem. Thus, the income insurance coverage of borrowing countries makes them take fewer precautions against negative shocks or even intentionally generate negative shocks. As a result, the efficient application of conditionality prevents borrowing country governments from abusing loans in order to remain dependent on additional loans (Vaubel 1991; Dreher and Vaubel 2004).

Finally, the IMF would play a paternalistic role. Because the Fund's preferences for how loans are used differ from those of borrowing governments, the IMF may want to restrict how loans are spent in order to increase the welfare of recipients. Loans can be used to pursue policies of redistribution from the rich to the poor, and this would be difficult to achieve without conditionality on the loans (Little and Clifford 1965).

Most importantly, and in light of the above, many advocates of IMF policies point to the importance of the IMF in developing reforms, including structural, fiscal, and institutional reforms. These reforms play a crucial role in market economies. Indeed, financial sector reforms, for example, contribute to the development of the financial sector through the development of financial institutions (insurance companies, pension funds, banks, mutual funds, and other types of non-bank financial institutions) and the development of financial markets (stock and bond markets) enabling an increase in credit services to the private sector. Financial development thus facilitates the development of more skill- and value-added-intensive industries (Levchenko 2007; Feenstra et al. 2013; Sheng and Yang 2016). In addition, IMF conditions calling for institutional reforms promote better quality bureaucracy, improved rule of law, and trans-

parency. Thus, according to the empirical literature, better institutional quality is a source of economic performance through the development of higher value-added sectors, skills development, new production technologies, and new product development (Acemoglu, Antràs, and Helpman 2007; Levchenko 2007; Feenstra et al. 2013; Sheng and Yang 2016). Conditionality also targets the implementation of reforms to limit state intervention (the privatization of state-owned enterprises), the reduction of budget deficits, as well as the streamlining of the government bureaucracy. These reforms can help avoid crowding out and thus allow for competition, greater efficiency, and growth. Conditionality also calls for reforms that increase the independence of central banks in their goal of stabilizing prices and reducing uncertainty about monetary policy (Demir 2022).

### 3 Data description and stylized facts

#### 3.1 Structural reforms datasets

The structural reform indicators used in this study are derived from those constructed by Alesina et al. (2020). These indicators focus on specific aspects of structural reforms aimed at liberalizing certain markets. The reforms cover two main economic sectors, namely the real sector and the financial sector. Real sector reforms cover trade (tariff), product, and labour market reforms. Financial reforms cover domestic and external finance.<sup>7</sup>

**Trade reforms:** Trade reforms measure tariffs at the product level. It aggregates tariff data at the product level by calculating simple, weighted averages (the weights are the share of exports of each product). These averages are then normalized from 0 (closed to trade) to 1 (fully open to trade).

**Product market reforms:** For product market reforms, the indicator considers liberalization in the telecommunications (competition, state ownership, presence or absence of an independent regulator, and degree of government intervention in access to telecommunications) and electricity sectors (consolidation or unbundling of generation, transmission and distribution, state ownership, presence or absence of an independent regulator, and degree of liberalization). For each of these dimensions, the product market reforms indicator ranges from 0 to 1, with 0 representing a country with a higher degree of repression and 1 representing a fully liberalized country. The aggregated index is constructed as the sum of the two sub-indicators and is normalized to range between 0 and 1, with higher values indicating a greater degree of liberalization in this sector.

**Labour market reforms:** Labour market reforms, on the other hand, provide indicators on employment protection legislation and the termination of full-time permanent contracts. Employment protection legislation covers procedural requirements (third-party approval), redundancy costs (severance pay, rating requirements), and the grounds for dismissal with or without recourse. The aggregated index is constructed as the sum of the sub-indicators and is normalized to range between 0 and 1, with higher values indicating a greater degree of liberalization.

**Financial reforms:** Financial sector reforms are those covering domestic finance and external finance. Domestic finance reforms cover six dimensions of financial regulation: credit control, interest rate controls, barriers to entry into banks, banking supervision, privatization, and security market development. As for external finance, the reforms cover restrictions on capital outflows and restrictions on capital inflows. Thus, the aggregate index on domestic finance reforms is a composite of the following six sub-indicators: Credit Controls, Interest Rate Controls, Bank Entry Barriers, Banking Supervision, Privatization, Security Market Development. The aggregate index of exter-

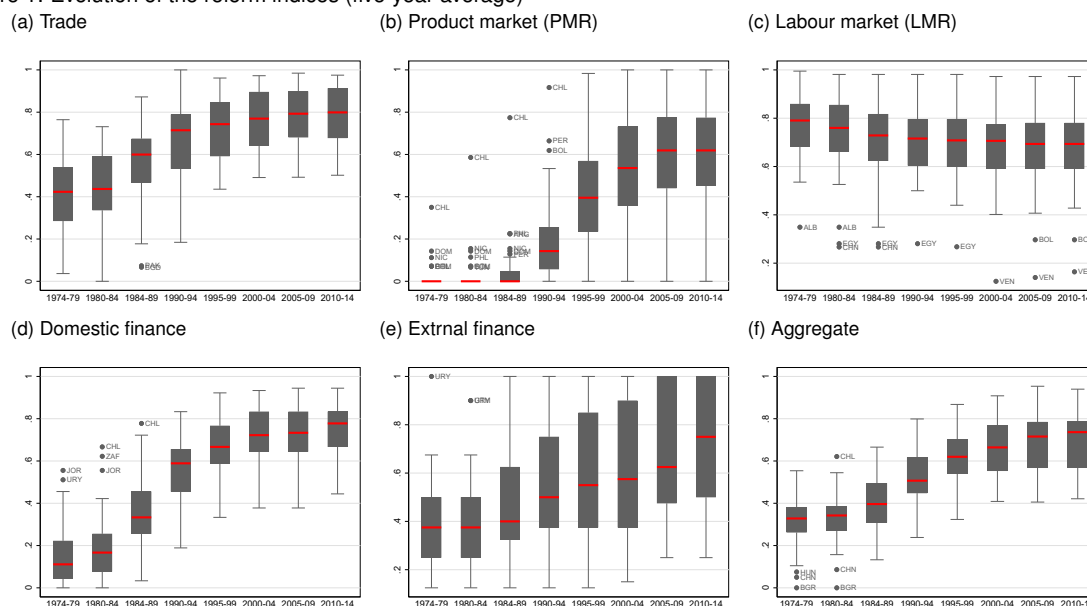
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<sup>7</sup> For a detailed description of the reform indicators, please refer to Table A4 in Appendix.



nal finance is a composite of an index on capital outflow restrictions and an index on capital inflow restrictions. Each index is normalized to a range between 0 and 1, where higher values indicate a higher level of liberalization.

Figure 1: Evolution of the reform indices (five-year average)



Source: authors' illustration based on the data from Alesina et al. (2020).

The evolution of reforms over five-year averages in Figure 1 shows that trade reforms were faster in the 1970s and late 1980s than reforms in other sectors. This could be explained by the structural adjustment programmes that were more oriented towards trade openness. Over the years, the distribution of reform indices has narrowed and by the end of the period 2010–14, 50% of countries have a liberalization index of at least 0.8, confirming that most countries have liberalized their trade regime. In addition to trade reforms, we observe that financial reforms have also made great progress. In particular, domestic financial reforms have shown strong variations over time. These developments can also be explained by the importance of IMF programmes. Indeed, most of the countries in the sample are dependent on IMF programmes with conditions, which have to meet a number of requirements such as the implementation of financial and fiscal reforms. Product market reforms, on the other hand, were less advanced in the 1970s. The removal of barriers in the electricity and telecommunications markets only really started in the early 1990s. Nevertheless, it can be noted that some countries such as Chile and the Dominican Republic had started product market liberalization very early. Finally, labour market reforms did not evolve significantly over the period studied.

### 3.2 IMF conditionality datasets

Most IMF financing is provided in tranches and linked to demonstrable policy actions in candidate countries. The objective is to ensure progress in the implementation of supported programmes and thus limit the risks to IMF resources. The IMF uses surveillance tools to assess whether a programme it supports in a given country is on track and whether improvements are needed. For example, the IMF Executive Board conducts periodic reviews to assess whether programme conditions have been met and to provide insight into the need to adjust the programme in light of new developments.

IMF programme conditions can take various forms, including quantitative performance criteria, indicative targets, structural benchmarks, structural performance criteria, and prior actions (see Figure 2):

**Prior actions (PAs)** are actions or measures that a country agrees to take before the IMF approves financing or completes a review. These actions are intended to ensure that the programme being

financed will have the necessary foundation for success (eg., elimination of price controls, budget consistent with fiscal framework).

**Quantitative performance criteria (QPCs)** refer to specific, measurable conditions that must be achieved. These conditions relate to macroeconomic variables such as monetary and credit aggregates, international reserves, fiscal balances, and external borrowing; which are under the control of the national authorities.

**Indicative targets (ITs)** are complementary to quantitative performance criteria (QPCs). They are intended to assess progress toward a programme's goals. They are sometimes set instead of QPCs because of uncertainty about the reliability of the data. As uncertainty decreases, these targets may become QPCs, with appropriate modifications.

**Structural benchmarks (SBs)** are often not quantifiable but are used as critical markers to assess the implementation of the programme. Thus, examples of structural benchmarks include improve financial sector operations, build up social safety nets, and strengthen public financial management.

**Structural performance criteria (SPCs)** are structural measures that are important to implement and that must be met for an IMF arrangement to continue.

The dataset consists of annual data for a panel of 135 emerging and low-income countries over the period 1985–2014.<sup>8</sup> They are taken directly from the dataset constructed by Kentikelenis et al. (2016) based on the IMF's Monitoring of Fund Arrangements (MONA) database.

Figure A1 in Appendix describes the average evolution of different categories of conditionality in IMF-supported programmes and reforms over the period 1985–2014.<sup>9</sup> In general, conditionality has evolved significantly. Starting from a low average of conditions imposed by the IMF on countries benefiting from these programmes, the average of total conditions was around eight conditions in 1999.

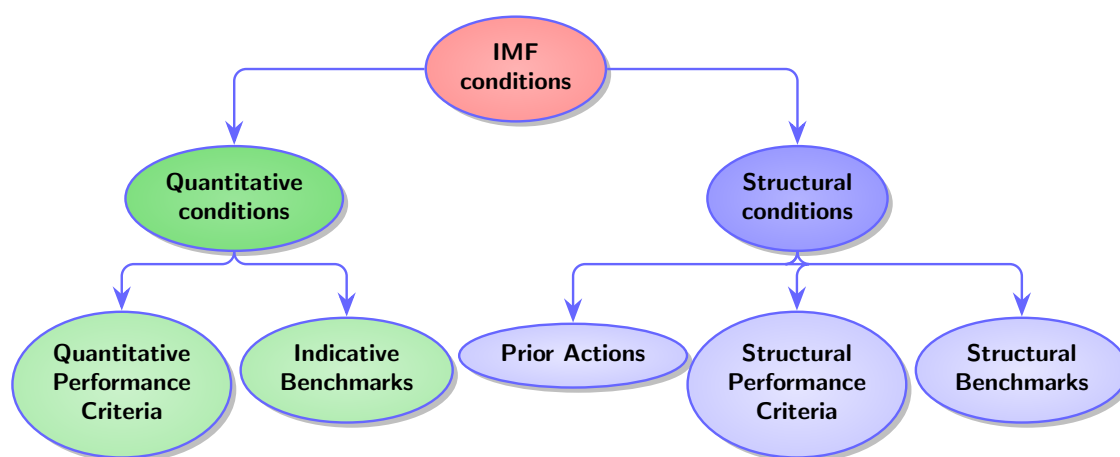
Following criticism from researchers and host country policy-makers at the IMF Board, the conditions were revised leading to the introduction of the 'streamlining initiative'. The introduction of the 'streamlining initiative' contributed to a gradual removal of structural performance criteria leading to an average of about six structural conditions per year. Figure A1 in Appendix translates these changes, marked by a reduction in the number of conditions starting around 2000. We can also see from the graph that the global financial crisis of 2008 further accentuated the removal of criteria before resuming an upward trend. Moreover, we observe similar dynamics of the aggregate reform indicator and the various types of conditionality over the period 1985–2000. These similar dynamics provide a starting point for conducting a regression analysis to study the link between reforms and IMF conditions. In particular, in the next section, we seek to analyse whether the IMF's conditions influence structural reforms.

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<sup>8</sup> Due to the availability of data on reforms, our study sample is reduced to 64 countries.

<sup>9</sup> Brief descriptive statistics are provided in Table A1 in Appendix.

Figure 2: Categories of conditions



Source: authors' illustration based on Kentikelenis et al. (2016).

### 3.3 Dependent, interest, and control variables

The dependent variable of this paper is the structural reforms computed as the average of the five reforms previously presented. For the variable of interest, we follow Crivelli and Gupta (2016) by defining a dummy variable that takes 1 if a country  $i$  at date  $t$  has at least one of the previously presented IMF conditions and 0 otherwise.

For the control group, we carefully select units without IMF programme conditionality that are, on average, as similar as possible to the treatment group consisting of units with 'IMF programme conditionality', in terms of relevant pre-treatment characteristics. Following Jorra (2012) and Balima and Sy (2021), we include the following control variables: GDP growth, debt service-to-exports, reserves-to-imports, external debt-to-GDP, parliamentary democracy. We augment this specification by adding real GDP per capita and domestic credit-to-private sector to capture the level of development and domestic financial sector development, respectively. Based on Balima and Sy (2021), we expect that countries with IMF programme conditionality will be marked by lower real GDP growth, higher debt service-to-GDP, lower reserves-to-imports, higher external debt-to-GDP, and lower level of parliamentary democracy. Finally, we hypothesize that both levels of development, namely real GDP per capita and financial development represented by the domestic credit-to-private sector, will show a negative correlation with the IMF programme. This suggests that less developed countries, which often struggle to access international financial markets or have limited financial development, may be more likely to rely on the IMF to address their savings gap. For robustness concerns, we add to these variables a large number of other potential determinants of IMF conditionality (structural reforms). Finally, to contain the reverse causality, we lag these variables by one period. The definitions and sources of all variables used in this paper are presented in the appendix.

## 4 Estimation approach

### 4.1 Methodology

This study analyses the effect of IMF (programme) conditionality on structural reforms. The main challenge is to establish a causal link from IMF conditionality to structural reforms. Indeed, two major problems arise in identifying the effect of IMF programme conditionality, namely counterfactual and endogeneity issues (Bird 2001; Dreher and Walter 2010; Balima and Sy 2021). On the one hand, it is difficult to correctly predict the outcome that would have been obtained in the absence of a programme and

to quantify the impact induced by programme participation. On the other hand, countries resort to the IMF in critical economic situations characterized by low economic growth or recessions, and poor external financial conditions, making programme participation non-random due to selection bias. In other words, when countries borrow from the IMF, their governments agree to adjust their economic policies to address problems that motivated them to seek financial assistance. These policy adjustments—which are tied to IMF conditions making their implementation non-random—are conditions of IMF loans and serve to ensure that a given country can repay the IMF.<sup>10</sup> To circumvent these problems and identify the effect of IMF conditionality, we use an impact assessment method, namely entropy balancing developed by Hainmueller (2012). This approach is used in the economic literature, including Neuenkirch and Neumeier (2016) to assess the impact of U.S. sanctions on poverty, Balima and Sy (2021) to evaluate the fiscal effect of IMF programmes. The entropy balance method has recently been applied by Apeti (2023a), Apeti and Edoh (2023), Apeti (2023b), and Apeti and N’Doua (2023) to analyse the welfare and fiscal impact of financial innovation such as mobile money, the effect of sovereign debt default on inequality, and the trade effect of timber and timber products regulations. Similar methods are used by Oberdabernig (2013) and Bird et al. (2021) to assess social effects of IMF programmes.

The approach used in this study is based on the principle that IMF conditionality are the treatment and structural reforms is the outcome variable. The units of observations are country-year observations. The observations with IMF conditionality are the treatment group, and those without IMF conditionality are the control group. The treatment effect on the treated (ATT) is defined as follows:

$$ATT = E[Y_{(1)}|T = 1] - E[Y_{(0)}|T = 1] \quad (1)$$

where  $Y_{(\cdot)}$  is the outcome variable measuring structural reforms.  $T$  indicates whether the observation unit is subject to IMF conditionality ( $T = 1$ ) or not ( $T = 0$ ).  $E[Y_{(1)}|T = 1]$  is structural reforms during the IMF conditionality period,  $E[Y_{(0)}|T = 1]$  represents the counterfactual outcome for countries that adopted IMF conditionality, i.e. the result of structural reforms in those countries if they had not implemented IMF conditionality.

The issue is that  $E[Y_{(0)}|T = 1]$  is not observable due to the non-random nature of IMF conditionality. If this were the case, the ATT could easily be identified by comparing structural reforms in IMF conditionality countries with non-IMF conditionality countries. Identifying ATT then requires a good proxy for  $E[Y_{(0)}|T = 1]$ . To do so, we match IMF conditionality units with non-IMF conditionality units that are as close as possible on observable characteristics that meet two criteria: correlated with IMF conditionality and structural reforms. Under the condition that the non-IMF conditionality units are fairly close to the IMF conditionality units, any difference in structural reforms is attributable to IMF conditionality adoption. Based on these different elements, we can rewrite Equation 1 as follows:

$$ATT = E[Y_{(1)}|T = 1, X = x] - E[Y_{(0)}|T = 0, X = x] \quad (2)$$

where  $X = x$  is a vector of observable covariates that may affect both the decision to adopt IMF conditionality and structural reforms,  $E[Y_{(1)}|T = 1, X = x]$  is structural reforms of IMF conditionality units, and  $E[Y_{(0)}|T = 0, X = x]$  is the expected structural reforms for the synthetic control units. Estimating the ATT by entropy balancing involves two steps. The first is to compute weights for the control group (non-treated group). These weights may satisfy pre-specified balanced constraints involving sample moments of observable characteristics ( $X$ ). Following Neuenkirch and Neumeier (2016), we choose balance constraints that impose equal covariates means between the treatment and control groups. In

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<sup>10</sup> See <https://www.imf.org/en/About/Factsheets/Sheets/2016/08/02/21/28/IMF-Conditionality>.

doing so, we want to ensure that the control group, on average, has non-treatment units that are as similar as possible to the treated units.<sup>11</sup> The second uses the weights from the first step in a regression analysis where structural reforms are the dependent variable. In the second step, we control for the covariates employed in the first step. This is equivalent to including control variables in a randomized experiment and increases estimation efficiency. Furthermore, in the second step, time- and country-specific effects are incorporated to account for time-specific factors like the global financial crisis, as well as country-specific variations resulting from differences in political, economic, and institutional environments.

Entropy balancing allows us to identify the effect of IMF conditionality by comparing IMF conditionality and non-IMF conditionality countries (or units) that are similar on observable characteristics while taking care to account for country- and time-specific effects. By combining both a matching and regression approach, this method offers some advantages over several existing methods as listed by Neuenkirch and Neumeier (2016). A particularly important advantage is that entropy balancing is non-parametric in the sense that no empirical model for either the outcome variable or selection into treatment needs to be specified. Hence, potential types of mis-specification like those, for instance, regarding the functional form of the empirical model, which likely lead to biased estimates, are ruled out. Also, in contrast to regression-based analyses, treatment effects estimates based on entropy balancing do not suffer from multicollinearity, as the reweighting scheme orthogonalizes the covariates with respect to the treatment indicator.

Moreover, in contrast to other matching methods, entropy balancing ensures a high covariate balance between the treatment and control group even in small samples. With ‘conventional’ matching methods such as, for instance, nearest-neighbour matching or propensity score matching, each treated unit—in the simplest case—is matched with the one untreated unit that is closest in terms of a metric balancing score. Accordingly, the control group is comprised of only a subset of the units that are not subject to treatment (Hainmueller 2012; Diamond and Sekhon 2013). In other words, with conventional matching methods, each untreated unit either receives a weight equal to 0, in the event it does not represent a best match for a treated unit, or equal to 1, in the event it does represent a best match for one treated unit. However, when the number of untreated units is limited, and the number of pretreatment characteristics is large, this procedure does not guarantee a sufficient balance of pretreatment characteristics across the treatment and control groups. This is a serious problem, as a low covariate balance may lead to biased treatment effect estimates. In contrast, with entropy balancing, the vector of weights assigned to the units not exposed to treatment is allowed to contain any non-negative values. Thus, a synthetic control group is designed that represents a virtually perfect image of the treatment group. Entropy balancing thus can be interpreted as a generalization of conventional matching approaches.<sup>12</sup> Also, compared to conventional matching where the control units are either discarded or matched, entropy balancing uses more flexible reweighting schemes. It reweights units with the goal of achieving balance between treated and untreated while keeping the weights as close as possible to the base weights to avoid a loss of information.

Finally, by combining a reweighting scheme with a regression analysis, entropy balancing allows us to properly address the panel structure of our data. In particular, we are able to control for both country-fixed as well as time-fixed effects in the second step of the matching approach, that is, the regression analysis. The inclusion of country-fixed effects is particularly useful in accounting for the potential unobserved heterogeneity between countries that have never adopted IMF conditionality and those that

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<sup>11</sup> This procedure ensures that once the weights are generated, IMF conditionality and non-IMF conditionality countries exhibit similar trends in their outcome variable over the pre-treatment period (see Ogrokhina and Rodriguez 2019).

<sup>12</sup> Hainmueller (2012), using Monte Carlo simulations as well as empirical applications, demonstrates that entropy balancing outperforms other matching techniques, such as propensity score matching, nearest-neighbour matching, and genetic matching, in terms of estimation bias and mean square error.

have adopted it, given that economic and political environments of these two groups of countries may differ beyond the set of covariates used in the entropy balancing approach. By including country-fixed effects, we also control for time-invariant country-specific factors that could lead to differences in structural reforms across countries. In other words, including country-fixed effects allows us to control for country-specific characteristics that may influence IMF conditionality adoption or shape structural reforms in the sample countries. As stated earlier, time-fixed effects allow us to control for time-specific effects such as the global financial crisis that may affect the countries in our sample. Despite the various advantages discussed in this section, it is essential to note that this approach may have some limits. Indeed, entropy balancing may fail to control potential endogeneity biases resulting from unobserved time-varying factors that may affect both IMF conditionality and structural reforms on the one hand, and on the other hand, to successfully deal with the inertia of structural reforms. To test the robustness of our conclusions, we complete the entropy balancing by alternative estimation methods such as ordinary least squares (OLS), propensity score matching (PSM), two-step system generalized method of moments (GMM) dynamic panel estimator. Finally, in addition to the endogeneity of conditionality, participation in IMF programmes is not the result of a random process. The circumstances of countries with IMF programmes are systematically different from those of countries without IMF programmes. This difference in circumstances may in turn affect the outcome of interest-structural reforms. While some empirical studies have shown that selection into IMF programmes depends on many factors, such as the level of international reserves, economic growth, or even the political regime (Barro and Lee 2005; Moser and Sturm 2011), others have also shown that IMF lending is a function of the Fund's major shareholders (Steinwand and Stone 2008). As a result, we test the robustness of our results using a fourth alternative method, the conditional mixed-process estimator (CMP) method used in the literature to assess the impact of conditionality on macroeconomic outcomes (Forster et al. 2020; Stubbs et al. 2020; Demir 2022).

## 5 Results

### 5.1 Covariates balance

We begin this section by analysing the performance of entropy balancing. To do so, we present some descriptive statistics obtained before and after weighting used to estimate the treatment effect of IMF conditionality. Table 1 presents in columns [1] and [2] the sample mean before weighting for country-year observations for the treatment group (with IMF conditionality) and the control group (without IMF conditionality), respectively. Column [3] of this table reports the difference in means between the two groups. The results reveal a difference between these two groups. Indeed, the IMF conditionality countries are characterized by lower real GDP growth, higher debt service-to-GDP, lower reserves-to-imports, higher external debt-to-GDP, lower level of parliamentary democracy, lower level of development, i.e. real GDP per capita, and lower financial development, i.e. lower domestic credit-to-private sector. These findings are consistent with the expected relationship between the IMF conditionality and the various control variables discussed above. These differences across IMF conditionality and non-IMF conditionality countries demonstrate the importance of selecting an appropriate control group when computing the treatment effect of IMF conditionality to avoid incorrectly estimated treatment effects.

In Table 2, columns [1] and [2] display the sample mean after weighting for both the treatment group and the synthetic group acquired through entropy balancing. Column [3] illustrates the difference between these two means. The analysis of the two groups in this table reveals the effectiveness of entropy balancing as the difference shown in the previous table seems to disappear. As a result, entropy balancing allows us to construct a perfect synthetic control group closely similar to the IMF conditionality countries in terms of the mean values of the pretreatment covariates.

Table 1: Descriptive statistics before weighting

	[1] IMF conditionality	[2] No IMF conditionality	[3]=[1]-[2] Diff
GDP growth (lag)	3.294	4.725	-1.431***
Debt service-to-exports (lag)	25.38	19.58	5.8***
Reserves-to-imports (lag)	29.98	43.01	-13.03***
External debt-to-GDP (lag)	65.36	45.35	20.01***
Parliamentary democracy (lag)	0.1407	0.1933	-0.0526***
Real GDP per capita (lag)	3714	5127	-1413***
Domestic credit-to-private sector (lag)	22.77	41.78	-19.01***
Obs	590	776	

Note: \*\*\*  $p \leq 0.01$ , \*\*  $p \leq 0.05$ , \*  $p \leq 0.1$ .

Table 2: Descriptive statistics after weighting

	[1] IMF conditionality	[2] Synthetic control	[3]=[1]-[2] Diff
GDP growth (lag)	3.294	3.317	-0.023
Debt service-to-exports (lag)	25.38	25.19	0.19
Reserves-to-imports (lag)	29.98	30.46	-0.48
External debt-to-GDP (lag)	65.36	64.81	0.55
Parliamentary democracy (lag)	0.1407	0.1442	-0.0035
Real GDP per capita (lag)	3714	3762	-48
Domestic credit-to-private sector (lag)	22.77	23.93	-1.16
Obs	590	776	
Total of weights	590	590	

Note: \*\*\*  $p \leq 0.01$ , \*\*  $p \leq 0.05$ , \*  $p \leq 0.1$ .

## 5.2 Treatment effects

With the synthetic controls in Table 2, we estimate the effect of IMF conditionality on structural reforms (ATT) in developing countries using the weighted least squares method. The results are reported in Table 3. Columns [1]–[4] present the second-stage results with no addition of the covariates used in the first stage in computing the synthetic group. Column [1] excludes country and year fixed effects. Columns [2]–[3] include, respectively, country and year fixed effects, while column [4] includes these two effects jointly. Finally, columns [5]–[8] repeat the exercise of columns [1]–[4] except for adding in each second-stage regression the covariates used in the first stage, namely GDP growth, debt service-to-exports, reserves-to-imports, external debt-to-GDP, parliamentary democracy, real GDP per capita, domestic credit-to-private sector. It is useful to note that including matching covariates in the second stage of entropy balancing increases the quality of the matching (as in a randomized experiment), while controlling for country and year fixed effects eliminates any country and year fixed effects.

Independent of the specification, IMF conditionality significantly increases (at 1%) structural reforms in our sample countries. This result ranges from 1.9 percentage points (column [2]) to 6 percentage points (column [5]), with an average effect of 3.7 percentage points. In other words, IMF conditionality increases on average structural reforms by 3.7 percentage points in countries using IMF conditionality compared to non-IMF conditionality countries.

Table 3: IMF programme conditionality and structural reforms

Structural reforms	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
IMF conditionality	0.057*** (0.0114)	0.022*** (0.0075)	0.042*** (0.0106)	0.019*** (0.0044)	0.060*** (0.0092)	0.025*** (0.0070)	0.051*** (0.0074)	0.020*** (0.0043)
Covariates in the second step	No	No	No	No	Yes	Yes	Yes	Yes
Year fixed effect in the second step	No	No	Yes	Yes	No	No	Yes	Yes
Country fixed effect in the second step	No	Yes	No	Yes	No	Yes	No	Yes
Observations	1366	1366	1366	1366	1366	1366	1366	1366
R <sup>2</sup>	0.023	0.595	0.358	0.888	0.328	0.660	0.667	0.899

Note: unreported constant included. Standard errors in brackets. \*\*\*  $p \leq 0.01$ , \*\*  $p \leq 0.05$ , \*  $p \leq 0.1$ .

## 6 Robustness checks

Our estimations show that IMF conditionality significantly increases structural reforms in developing countries. In this section, we test the robustness of these findings.

### 6.1 Alternative specifications

We begin this section by excluding some countries or periods. First, we exclude countries or periods that may exhibit high (low) reliance on the IMF or high (low) incentives to reform, such as fragile states, former and current communist countries, hyperinflation episodes, and deep recession (saving glut). The results of these different tests presented in columns [1]–[6] of Table A2 in Appendix provide robust results to our baseline findings. Next, we include developed countries in our sample. Results in column [7] of Table A2 in Appendix show that extending our country list to developed countries does not alter our conclusion: IMF conditions promote structural reforms. Finally, we exclude non-IMF condition countries from our sample because treated countries (IMF programme condition countries) may differ from non-treated countries (non-IMF condition countries) beyond the characteristics we control for in our model (Neuenkirch and Neumeier 2015). Moreover, since we drop the non-IMF condition countries, which are essentially our control groups, there is a risk that the effect captured is simply a secular trend and not necessarily due to IMF conditions since by excluding these countries, our analysis is equivalent to comparing structural reforms before and after the treatment of treated countries, i.e. IMF condition countries. To overcome this problem, we add a time trend to our model. The results of Table A2 (column [8]) in Appendix provide relatively similar results to our baseline findings.

Second, we test the consistency of our results by including a set of additional control variables. Based on the literature on IMF programme conditions and structural reforms, the following variables are selected: election, years left in current term, government polarization, checks and balances, real exchange rate, exchange rate regime, financial crisis, democracy, trade openness, current account balance, inflation, financial openness, sovereign credit default swaps (CDS) market dummy, growth volatility, Gini index (market), Gini index (net). In addition to these control variables, we include time trends to capture potential linear changes that may exist in our outcome variable, i.e. structural reforms. Indeed, since the 1980s—with the notable exception of the global financial crisis with a modest reversal of reforms in some countries—there are broad trends to pursue liberalization/structural reforms (Alesina et al. 2020). Consequently, we assume that these trends may cause linear evolution or secular trends that time-fixed effects cannot fully capture. Columns [9]–[26] of Table A2 in Appendix, which report the results of these specifications, show their consistency with our baseline findings. In other words, adding these additional covariates does not change our results.

Third, the effect observed in this study could be susceptible to certain issues. For instance, IMF conditionality might trigger changes in the economic environment of countries. As a result, the effect observed may not be solely attributable to IMF conditionality but could be influenced by alterations



in institutional, political, social, or economic conditions following its implementation. To circumvent this problem, we use a similar approach to Neuenkirch and Neumeier (2015) by computing four new treatment variables defined over a five-year window around the adoption of IMF conditions, i.e. from five years before to five years after, from four years before to four years after, from three years before to three years after, from two years before to two years after. Results from these different specifications, presented in Table 4 (columns [1]–[4]), are consistent with our baseline findings. As a result, we can conclude that the effect of IMF conditionality on structural reforms is not due to changes in countries’ political, economic, or institutional environments after the introduction of the programme. In other words, the effect identified in this paper is due to the introduction of IMF conditionality and not potential changes in the economic, political, social, or institutional environment that this conditionality may induce in our sample countries.

Fourth, we perform a placebo (falsification) test. To do this, we define placebo or arbitrary dates for IMF conditionality, computed by randomly assigning conditionality episodes to countries in our sample after removing actual condition years. The intuition is that if our baseline results are due to IMF conditionality, the use of placebo dates should produce statistically non-significant estimated effects. Results based on entropy balancing and using placebo IMF conditions are presented in column [5] of Table 4. The non-statistically significant effect of placebo IMF conditionality on structural reforms underscores the robustness of our findings, especially with respect to measurement error.

Fifth, we test the robustness of our results to changes in the definitions of our dependent and treatment variables. First, we change the definition of our dependent variable, i.e. structural reforms, by computing the reform gap between the United States and every country in our sample. The results in Table 4 (column [6]) show that IMF conditions reduce the reform gap between the United States and countries with such conditions. In other words, altering the definition of our dependent variable does not change our conclusion: IMF conditionality favours structural reforms in developing countries. Finally, given that using a dummy variable in a cross-country study may ignore the treatment intensity, we test the robustness of our conclusion with a continuous treatment variable that is defined as the number of IMF conditions that country  $i$  has at time  $t$ . The estimation performed by the Blundell and Bond (1998) two-step system GMM dynamic panel estimator to contain potential endogeneity problems shows a positive effect of IMF conditionality on structural reforms (column [2] of Table 6). Specifically, an increase in the number of conditions increases structural reforms. This result shows that changing the measure of the treatment variable (from binary to continuous) does not alter the direction of our initial findings.

Table 4: Adjusting the treatment variable and placebo test

	[1]	[2]	[3]	[4]	[5]	[6]
	Structural reforms	Structural reforms	Structural reforms	Structural reforms	Structural reforms	Structural reforms
IMF conditionality [2; 2]	0.010* (0.0053)					
IMF conditionality [3; 3]		0.011** (0.0048)				
IMF conditionality [4; 4]			0.011** (0.0048)			
IMF conditionality [5; 5]				0.013*** (0.0045)		
Placebo IMF conditionality					-0.001 (0.0044)	
Reforms gap (vis-à-vis USA)						-0.020*** (0.0043)
Covariates in the second step	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect in the second step	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effect in the second step	Yes	Yes	Yes	Yes	Yes	Yes
Observations	530	663	663	855	1062	1366
$R^2$	0.934	0.931	0.931	0.925	0.877	0.860

Note: unreported constant included. Standard errors in parentheses. \*\*\*  $p \leq 0.01$ , \*\*  $p \leq 0.05$ , \*  $p \leq 0.1$ .

## 6.2 Alternative estimation methods

We begin this exercise using the OLS method. Starting with a naive model that includes only the treatment variable as an explanatory variable, we gradually add the same control variables used in the entropy balancing approach, while carefully controlling for country and year fixed effects (see Neuenkirch and Neumeier 2016). The result in columns [1] (the naive specification) to [8] (the baseline specification) of Table A3 in Appendix shows that, as in the entropy balancing approach, IMF conditionality favours structural reforms. Second, we augment our baseline specification with additional control variables used in the entropy balancing exercise. The results reported in columns [9]–[25] of Table A3 in Appendix remain consistent with those highlighted earlier: IMF conditionality favours structural reforms.

Next, we test the robustness of our results using propensity score matching (Rosenbaum and Rubin 1983), which is part of an impact analysis method. It allows us to correct endogeneity problems, particularly selection bias. The results in Table 5 compile the estimation of the IMF conditionality effect (ATT) using four matching methods: nearest-neighbour matching, radius matching, kernel matching, and local linear regression matching. They allow us to confirm the consistency of our results with the choice of the alternative method, as the average treatment effects on the treated (ATTs) are both independent of the matching method used positively and statistically significant.

Table 5: IMF conditionality and structural reforms: using PSM

Dependent variable: structural reforms	Nearest-neighbour matching			Radius matching			Kernel matching	Local linear regression matching
	N=1	N=2	N=3	r=0.005	r=0.01	r=0.05		
IMF conditionality on structural reforms								
ATT	0.071*** (0.0149)	0.076*** (0.0135)	0.078*** (0.0127)	0.072*** (0.0117)	0.071*** (0.0108)	0.065*** (0.0100)	0.065*** (0.0100)	0.066*** (0.0101)
Number of treated obs.	590	590	590	590	590	590	590	590
Number of controls obs.	776	776	776	776	776	776	776	776
Observations	1366	1366	1366	1366	1366	1366	1366	1366
Pseudo $R^2$	0.003	0.003	0.006	0.006	0.006	0.004	0.004	0.003
Standardized biases (p-value)	0.711	0.639	0.193	0.256	0.221	0.487	0.488	0.711
Rosenbaum bounds sensitivity tests	1.7	2	2.1	2.1	2.1	2	2	2

Note: bootstrapped standard errors based on 500 replications reported in brackets. Standard errors in parentheses. \*\*\*  $p \leq 0.01$ , \*\*  $p \leq 0.05$ , \*  $p \leq 0.1$ .

Third, we test the robustness of our results using the Blundell and Bond (1998) two-step system GMM dynamic panel estimator.<sup>13</sup> This method provides us with two major opportunities. First, it allows us to include the lagged structural reforms in the control variables to control potential inertia that may characterize reforms. Second, this method addresses the lack of a valid external instrument for estimating the causal effect of IMF conditionality on structural reforms while controlling for the Nickell bias that arises when estimating a dynamic panel with fixed effects. The results from this method are in column [1] of Table 6 and show that IMF condition adoption significantly increases structural reforms. In addition, results show some persistence of structural reforms. This is signaled by a positive and significant coefficient of 0.91 for lagged structural reforms. The last column of Table 6 presents the results of the CMP method and the estimated effects are robust to the baseline results.

<sup>13</sup> This method combines equations in levels and first differences in a system and estimates them with an extended system GMM estimator that allows the use of lagged differences and levels of explanatory variables as instruments. Compared to the difference GMM estimator, system GMM estimator allows introducing more instruments by adding a second equation, which should improve estimation efficiency. To tackle the instrument proliferation problem raised by the method above, we follow Roodman (2009) by collapsing the instrument matrix and limiting the number of lags to three. Moreover, to avoid that the standard errors are downward-biased, we use the Windmeijer (2005) finite-sample correction to reduce the possibility of spurious precision.

Based on these different results, we can conclude that our results are robust to the choice of estimation method since changing the method does not qualitatively modify our conclusions.

Table 6: IMF conditionality and structural reforms: using system GMM and CMP

	[1] Structural reforms: system GMM	[2] Structural reforms: system GMM	[3] Structural reforms: CMP
Lag structural reforms	0.910*** (0.0747)	0.939*** (0.0747)	
IMF conditionality (dummy)	0.080** (0.0337)		0.023** (0.0109)
IMF conditionality (continue)		0.002* (0.0009)	
Real GDP growth	0.007* (0.0038)	0.007* (0.0043)	0.001* (0.0007)
Debt service-to-exports	0.000 (0.0010)	0.001 (0.0011)	0.000 (0.0003)
Reserves-to-imports	0.001** (0.0002)	0.000 (0.0003)	0.000 (0.0002)
External debt-to-GDP	-0.000 (0.0004)	-0.000 (0.0004)	-0.000*** (0.0001)
Parliamentary democracy	0.019 (0.0342)	0.018 (0.0276)	0.011 (0.0443)
Real GDP per capita	0.000 (0.0000)	0.000 (0.0000)	0.000 (0.0000)
Financial development	-0.000 (0.0003)	-0.000 (0.0003)	0.000 (0.0004)
Observations	308	308	1049
AR(1)	0.006	0.008	
AR(2)	0.451	0.139	
Hansen p-value	0.120	0.178	
Nb. of instruments/Nb. of countries	34/ 51	34/ 51	

Note: standard errors in parentheses. \*\*\*  $p \leq 0.01$ , \*\*  $p \leq 0.05$ , \*  $p \leq 0.1$ .

## 7 Heterogeneity

### 7.1 Disaggregated analysis of structural reforms and IMF conditionality

There is significant diversity in the intensity and conditions imposed by the IMF on countries seeking loans. Additionally, reforms span across various sectors of activity, making it crucial to comprehend the specific type of conditionality that influences each type of reform. Hence, this section aims to analyse the impact based on the category of conditionality and the nature of the reforms.

First, in Table 7, we provide an analysis of the influence of total conditions on five different types of reforms. The findings reveal that IMF conditionality plays a significant role in promoting trade, external finance, domestic finance, and product market reforms. These types of reforms show a clear positive association with the conditions imposed by the IMF. However, when it comes to labour market reforms, the estimates suggest that there is no substantial statistical evidence supporting the importance of total

conditionality in stimulating such reforms. In other words, the conditions imposed by the IMF do not appear to have a strong impact on labour market reforms based on the available data and analysis.

Table 7: Type of reform

	[1]	[2]	[3]	[4]	[5]
	Trade reforms	External financial reforms	Domestic financial reforms	Product market reforms	Labour market reforms
IMF conditionality	0.022*** (0.0081)	0.031*** (0.0095)	0.013** (0.0062)	0.018** (0.0075)	0.006 (0.0038)
Covariates in the second step	Yes	Yes	Yes	Yes	Yes
Year fixed effect in the second step	Yes	Yes	Yes	Yes	Yes
Country fixed effect in the second step	Yes	Yes	Yes	Yes	Yes
Observations	1234	1366	1366	1366	1334
R2	0.832	0.767	0.903	0.856	0.845

Note: standard errors in parentheses. \*\*\*  $p \leq 0.01$ , \*\*  $p \leq 0.05$ , \*  $p \leq 0.1$ .

Second, in Table 8, we examine the relationship between different categories of conditionality and aggregate reforms through regression analysis. Columns [1] and [2] specifically focus on the impact of structural and quantitative conditions, respectively, on aggregate reforms. Notably, both types of conditionality demonstrate a significant contribution to market liberalization. To delve deeper into this relationship, we further break down the impact of different categories within the ‘quantitative’ and ‘structural’ conditions on aggregate reforms. In columns [3] to [5], we estimate the effects of various structural condition categories. Among these categories, it becomes evident that only ‘structural benchmarks’ play a role in promoting structural reforms. On the other hand, within the quantitative condition categories (columns [6] and [7]), only ‘quantitative performance criteria’ demonstrate a significant contribution to the implementation of structural reforms. To summarize the findings, the analysis of different categories of conditionality reveals that, among the structural conditions, only ‘structural benchmarks’ have an impact on aggregate reforms. Conversely, among the quantitative conditions, only ‘quantitative performance criteria’ play a significant role in driving aggregate reforms. This highlights the varying effects and importance of specific conditionality categories in shaping overall reform outcomes.

Table 8: Type of conditionality

	[1]	[2]	[3]	[4]	[5]	[6]	[7]
	Structural reforms	Structural reforms	Structural reforms	Structural reforms	Structural reforms	Structural reforms	Structural reforms
Structural conditions	0.007* (0.0044)						
Quantitative conditions		0.021*** (0.0043)					
Structural benchmarks			0.012*** (0.0044)				
Structural performance criteria				-0.000 (0.0045)			
Prior actions					0.001 (0.0044)		
Indicative benchmarks						0.004 (0.0041)	
Quantitative performance criteria							0.024*** (0.0042)
Covariates in the second step	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect in the second step	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effect in the second step	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1366	1366	1366	1366	1366	1366	1366
R <sup>2</sup>	0.905	0.900	0.917	0.917	0.908	0.917	0.899

Note: standard errors in parentheses. \*\*\*  $p \leq 0.01$ , \*\*  $p \leq 0.05$ , \*  $p \leq 0.1$ .

Next, in Table 9, we explore the effects of conditionality categorized as structural conditions and quantitative conditions on reforms in various sectors. The results indicate that quantitative conditions have a positive and statistically significant impact on reform indicators across most sectors, except for labour market reforms (column [5]). To illustrate, let’s consider the example of trade reforms (column [1]). The findings suggest that when a country accepts the quantitative conditions set by the IMF, there is an average increase of 2.3 percentage points in trade liberalization with the outside world, all other factors held constant. In contrast, the impact of structural conditions is significant primarily in the context of labour market reforms. This implies that accepting the IMF’s structural conditions is associated with notable improvements in labour market policies.

Table 9: Quantitative conditions and structural conditions

	[1]	[2]	[3]	[4]	[5]
	Trade reforms	External financial reforms	Domestic financial reforms	Product market reforms	Labour market reforms
Quantitative conditions	0.023*** (0.0080)	0.031*** (0.0095)	0.014** (0.0062)	0.016** (0.0076)	0.006 (0.0036)
Observations	1234	1366	1366	1366	1334
$R^2$	0.832	0.769	0.904	0.857	0.847
Structural conditions	-0.007 (0.0077)	0.007 (0.0096)	0.010 (0.0064)	0.013 (0.0081)	0.009** (0.0040)
Observations	1234	1366	1366	1366	1334
$R^2$	0.832	0.784	0.903	0.858	0.851
Covariates in the second step	Yes	Yes	Yes	Yes	Yes
Year fixed effect in the second step	Yes	Yes	Yes	Yes	Yes
Country fixed effect in the second step	Yes	Yes	Yes	Yes	Yes

Note: standard errors in parentheses. \*\*\*  $p \leq 0.01$ , \*\*  $p \leq 0.05$ , \*  $p \leq 0.1$ .

Finally, we undertake an alternative disaggregation of the impact of quantitative and structural conditions based on their different components, as outlined in Table 10. In the first three lines of the table, we focus on the influence of the components of structural conditions, namely ‘structural benchmarks’, ‘structural performance criteria’, and ‘prior actions’.

Among these three categories of conditionality, we find that structural benchmarks have a favourable effect on the implementation of domestic financial and product market reforms, as well as labour market reforms. This indicates that when countries adhere to the specific targets set by the IMF in the form of structural benchmarks, they are more likely to witness positive changes in these areas. On the other hand, the impact of structural performance criteria is significant only for labour market reforms. This suggests that meeting the specific performance criteria related to labour market policies is instrumental in driving improvements in this particular sector. The category of prior actions, however, does not show a statistically significant impact on any of the studied reform dimensions.

Moving on to the components of quantitative conditions, namely ‘quantitative performance criteria’ and ‘indicative benchmarks’ (rows [4] to [5] of Table 10), the results reveal interesting patterns. Quantitative performance criteria have a positive and statistically significant effect on all five dimensions of reforms analysed. This indicates that countries that fulfill the quantitative targets set by the IMF in areas such as fiscal policies, monetary policies, and other macroeconomic indicators are more likely to experience comprehensive reforms. On the other hand, conditions based on indicative benchmarks demonstrate a statistically significant positive effect solely on product market reforms. This suggests that meeting the indicative benchmarks specifically related to market competition and regulations can drive improvements in the product market sector.

Table 10: Structural conditions by categories

	[1]	[2]	[3]	[4]	[5]
	Trade	External financial	Domestic financial	Product market	Labour market
Structural benchmarks [1]	-0.000 (0.0077)	0.010 (0.0097)	0.020*** (0.0064)	0.026*** (0.0091)	0.012*** (0.0047)
Observations	1234	1366	1366	1366	1334
R <sup>2</sup>	0.841	0.804	0.907	0.868	0.852
Structural performance criteria [2]	-0.009 (0.0088)	-0.012 (0.0102)	-0.002 (0.0071)	-0.012 (0.0094)	0.010** (0.0043)
Observations	1234	1366	1366	1366	1334
R <sup>2</sup>	0.850	0.805	0.904	0.852	0.872
Prior actions [3]	-0.007 (0.0076)	0.009 (0.0099)	-0.006 (0.0071)	0.012 (0.0092)	-0.003 (0.0042)
Observations	1234	1366	1366	1366	1334
R <sup>2</sup>	0.844	0.810	0.895	0.858	0.870
Quantitative performance criteria [4]	0.026*** (0.0079)	0.037*** (0.0095)	0.011* (0.0062)	0.021*** (0.0078)	0.010*** (0.0039)
Observations	1234	1366	1366	1366	1334
R <sup>2</sup>	0.832	0.771	0.901	0.856	0.839
Indicative benchmarks [5]	-0.008 (0.0078)	-0.003 (0.0092)	0.011 (0.0067)	0.020** (0.0091)	-0.000 (0.0039)
Observations	1234	1366	1366	1366	1334
R <sup>2</sup>	0.851	0.801	0.906	0.865	0.864
Covariates in the second step	Yes	Yes	Yes	Yes	Yes
Year fixed effect in the second step	Yes	Yes	Yes	Yes	Yes
Country fixed effect in the second step	Yes	Yes	Yes	Yes	Yes

Note: standard errors in parentheses. \*\*\*  $p \leq 0.01$ , \*\*  $p \leq 0.05$ , \*  $p \leq 0.1$ .

## 7.2 Further analyses

Addressing the durability of the impact of conditionality on reforms is a crucial concern. There is a possibility that a country might comply with IMF conditions solely to secure necessary loans, but once the funds are obtained, the country may disengage from pursuing the required reforms in various sectors. Therefore, we examine the dynamic effects of conditionality on aggregate reforms. In Table 11, we present the effects of total conditionality on aggregate reforms over a five-year period. The findings reveal an immediate positive and statistically significant impact of conditionality on reforms. At the time of adoption, the magnitude of the coefficient is strong, indicating a substantial effect on reforms. However, as time passes, the amplitude of the coefficient diminishes. For instance, one year after the conditions are implemented, reforms increase by 1.9 percentage points. However, five years after the adoption of the conditions, the improvement in sector liberalization is 1.4 percentage points. This decline in intensity is commonly referred to as ‘reform fatigue’. It is attributed to the fact that over time, people may lose confidence in the potential benefits of reforms, leading to a lack of public support. In other words, if there is no significant improvement in economic performance, policy-makers implementing reforms may fear a lack of support from the electorate, which could potentially result in their removal from office. This fear of political repercussions can contribute to a diminishing drive to sustain or further pursue the necessary reforms (see, for example, Lora et al. 2004; Bowen et al. 2016; Alesina et al. 2020).

Table 11: Effect over time

	[1]	[2]	[3]	[4]	[5]	[6]
	Structural reforms	Structural reforms	Structural reforms	Structural reforms	structural reforms	Structural reforms
IMF conditionality (t0)	0.021*** (0.0068)					
IMF conditionality (t+1)		0.019*** (0.0057)				
IMF conditionality (t+2)			0.016*** (0.0051)			
IMF conditionality (t+3)				0.015*** (0.0047)		
IMF conditionality (t+4)					0.015*** (0.0045)	
IMF conditionality (t+5)						0.014*** (0.0044)
Covariates in the second step	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect in the second step	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effect in the second step	Yes	Yes	Yes	Yes	Yes	Yes
Observations	893	994	1066	1128	1176	1212
R2	0.903	0.899	0.898	0.900	0.901	0.903

Note: standard errors in parentheses. \*\*\*  $p \leq 0.01$ , \*\*  $p \leq 0.05$ , \*  $p \leq 0.1$ .

Additionally, we consider various cyclical and structural characteristics in our analysis. The results presented in Table 12 indicate that the impact of conditionality on reforms is not dependent on the business cycle (good times vs. bad times), the level of development (emerging countries vs. low-income countries), or the monetary and fiscal stance (strong vs. loose). Interestingly, the findings demonstrate that the effect of conditionality is relatively more pronounced during periods of good economic conditions, in emerging countries, and when monetary or fiscal policies are robust. This suggests that conditionality has a greater impact during favourable economic circumstances, in countries with greater development potential, and when policy environments are conducive to reform implementation.

Furthermore, the results highlight the significance of institutional quality. Countries with better institutional frameworks benefit more from the reform-promoting effects of conditionality. It is worth noting that even countries with lower institutional quality can still experience a positive but statistically insignificant impact on reforms when subjected to conditionality (column [5]). This implies that conditionality can incentivize countries with weaker institutions to improve them and subsequently benefit from the reforms. The analysis in column [6] reveals that programmes without conditions do not have a significant impact on reform. This underscores the importance of attaching conditions to IMF programmes to drive meaningful changes in policies and practices.

Moreover, column [7] examines the effects of conditions on the adoption of reforms in trading partner countries and neighbouring countries undergoing reforms. The results indicate that conditionality has a significant influence on reforms in trading partner countries. This suggests that when a country adopts IMF conditions and implements the associated reforms, it influences its trading partners to undertake similar reforms. Peer pressure or imitation among trading partners can contribute to this phenomenon. However, there is no strong statistical evidence of reform implementation in neighbouring countries. The effectiveness of met and unmet conditions on reforms is assessed in the final column. The findings demonstrate that both met and unmet conditions significantly contribute to structural reforms. However, in terms of intensity, the effectiveness of met conditions is 1.95 times greater compared to that of unmet conditions. This implies that when countries fully meet the conditions set by the IMF, the resulting reforms have a more substantial impact compared to cases where conditions are partially or not met.

Table 12: Structural characteristics

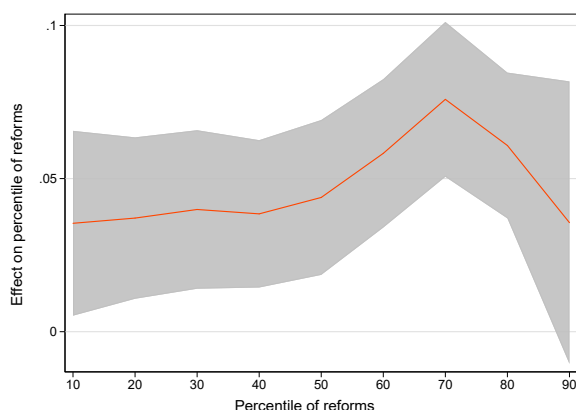
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Bad times	0.020*** (0.0061)							
Good times	0.025*** (0.0062)							
Loose fiscal stance		0.011* (0.0062)						
Strong fiscal stance		0.025*** (0.0053)						
Loose monetary stance			0.015** (0.0058)					
Strong monetary stance			0.026*** (0.0062)					
Developing countries				0.019*** (0.0052)				
Emerging countries				0.026*** (0.0064)				
Weak institutional quality					0.002 (0.0042)			
Sound institutional quality					0.036*** (0.0067)			
IMF programme w/o conditionality						-0.010 (0.0096)		
Reform in trading partners							0.020*** (0.0043)	
Reform in neighbouring countries							-0.004 (0.0040)	
Met								0.039*** (0.0135)
Not Met								0.020*** (0.0045)
Covariates in the second step	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect in the second step	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effect in the second step	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1366	1366	1366	1366	1236	1135	1366	1366
R <sup>2</sup>	0.919	0.923	0.913	0.905	0.943	0.911	0.865	0.938

Note: standard errors in parentheses. \*\*\*  $p \leq 0.01$ , \*\*  $p \leq 0.05$ , \*  $p \leq 0.1$ .

Lastly, we employ quantile regression to examine the impact of conditionality on different segments of reform. This estimation method allows us to analyse low, intermediate, and high levels of structural reform indices, enabling targeted policy implications based on a country's reform status. Figure 3 presents the results of the impact of conditionality (total) on aggregate reforms across various quantiles. The graph illustrates a significant positive effect, with the intensity of conditionality increasing from low reformers to intermediate high reformers (up to the 70<sup>th</sup> quantile). This indicates that conditionality has a notable impact on driving reforms for countries in these segments. However, beyond the 70<sup>th</sup> quantile, the intensity of conditionality weakens, although it remains positive for the top 30 reformers. This suggests that as the economy becomes more liberal and progresses with reforms, the imposition of further conditionality may become less effective and could potentially hinder the progress of more liberal economies.



Figure 3: Impact of conditionality on reforms at different quantiles



Source: authors' illustration based on study data.

## 8 Concluding remarks

The aim of this paper is to analyse the effect of IMF conditionality on structural reforms in developing countries. Based on a sample of 64 developing countries over the period 1980–2014 and using entropy balancing, we show that periods of IMF conditionality are associated with higher structural reforms. In other words, we find that IMF programme conditionality promotes structural reforms. This result—robust to several tests including alternative specifications and alternative estimation methods—presents some heterogeneity. Indeed, we show that the effect of IMF conditionality can vary according to the type of conditionality, type of reform, time, and initial level of structural reforms, and can depend on some structural factors including the business cycle, the stance of fiscal and monetary policy, the level of development, and the quality of institutions. Moreover, we show that IMF conditionality might have spillover effects only on trading partners, and no evidence appears with geographic proximity. Finally, we provide evidence that IMF programmes without conditionality do not promote structural reforms and successful IMF conditionality programmes tend to have a larger impact on structural reforms.

Compared to developed countries, the COVID-19 crisis appears to have long-lasting effects on the economies of developing countries, as their growth is expected to take longer to return to pre-pandemic levels. As a result, international cooperation is likely needed to help these countries recover from the crisis and prepare them for crises that are likely to be frequent in a world characterized by global tensions and major environmental and social challenges. In this context, the IMF's contribution could play a crucial role in facilitating reforms and, consequently, fostering growth in these countries.

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## Appendix

Table A1: Summary statistics

	Full sample	EMs	LICs
Quantitative performance criteria	5.44 (10.61)	7.84 (12.35)	9.50 (11.99)
Structural benchmark	1.33 (3.855)	1.71 (4.624)	2.69 (4.440)
Structural performance criteria	0.33 (1.300)	0.40 (1.580)	0.76 (1.532)
Prior actions	0.77 (3.525)	1.16 (4.711)	1.16 (3.235)
Indicative targets	1.49 (4.746)	1.39 (4.139)	4.34 (7.986)
<i>N</i>	3261	1432	641

Standard deviations in parentheses. EMs: Emerging market economies , LICs: Low-income countries

Table A2: IMF condition and structural reforms: sample alteration and additional controls

	[1] Excluding fragile states	[2] Excluding former and current communist countries	[3] Excluding hyperinflation episodes	[4] Excluding GFC	[5] Excluding saving glut periods	[6] Excluding deep recession	[7] Including developed countries	[8] Time trend	[9] Time trend	[10] Election	[11] Years left in current term	[12] Government polarization	[13] Checks and balances
IMF conditionality	0.020*** (0.0045)	0.021*** (0.0045)	0.032*** (0.0055)	0.022*** (0.0048)	0.022*** (0.0048)	0.012*** (0.0042)	0.019*** (0.0039)	0.020*** (0.0043)	0.020*** (0.0043)	0.020*** (0.0043)	0.023*** (0.0044)	0.021*** (0.0042)	0.019*** (0.0042)
Covariates in the second step	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect in the second step	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effect in the second step	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1302	1171	879	1078	1027	1202	2149	1334	1366	1366	1213	1362	1339
R <sup>2</sup>	0.896	0.901	0.893	0.896	0.890	0.914	0.899	0.900	0.899	0.899	0.903	0.900	0.904
	[14] Real exchange rate	[15] Exchange rate regime	[16] Financial crisis	[17] Democracy	[18] Trade openness	[19] Current account balance	[20] Inflation	[21] Financial openness	[22] Sovereign CDS dummy	[23] Growth volatility	[24] Gini index (market)	[25] Gini index (net)	[26] Education
IMF conditionality	0.023*** (0.0043)	0.019*** (0.0042)	0.021*** (0.0042)	0.019*** (0.0043)	0.020*** (0.0042)	0.019*** (0.0042)	0.018*** (0.0045)	0.020*** (0.0039)	0.020*** (0.0043)	0.021*** (0.0043)	0.021*** (0.0041)	0.021*** (0.0041)	0.020*** (0.0044)
Covariates in the second step	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect in the second step	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effect in the second step	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1366	1319	1366	1333	1364	1351	1216	1350	1366	1353	1227	1227	1041
R <sup>2</sup>	0.902	0.903	0.901	0.899	0.900	0.900	0.914	0.921	0.899	0.900	0.914	0.914	0.906

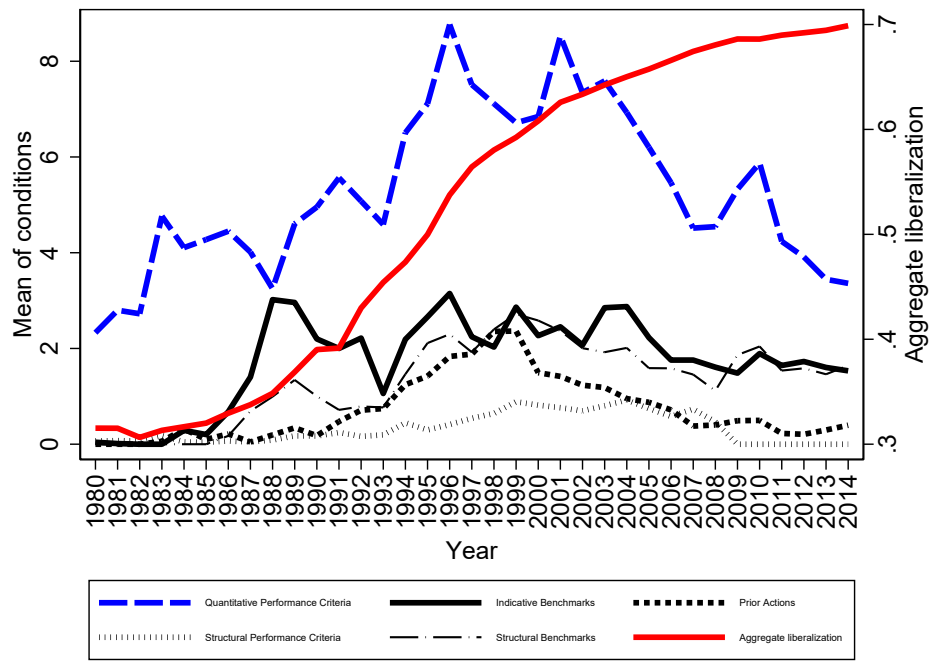
Note: unreported constant included. Standard errors in parentheses. \*\*\*  $p \leq 0.01$ , \*\*  $p \leq 0.05$ , \*  $p \leq 0.1$ .

Table A3: IMF conditionality and structural reforms: using OLS

Structural reforms	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]			
IMF conditionality	0.012*** (0.0039)	0.014*** (0.0038)	0.020*** (0.0039)	0.015*** (0.0039)	0.014*** (0.0039)	0.014*** (0.0039)	0.016*** (0.0041)	0.017*** (0.0042)	0.017*** (0.0042)	0.017*** (0.0042)	0.017*** (0.0042)	0.016*** (0.0042)	0.018*** (0.0042)	0.017*** (0.0041)	0.014*** (0.0041)	0.014*** (0.0041)	0.013*** (0.0042)	0.012*** (0.0042)	0.011*** (0.0042)	0.017*** (0.0039)	0.017*** (0.0039)	0.015*** (0.0039)	0.017*** (0.0040)	0.016*** (0.0039)	0.016*** (0.0039)	0.009** (0.0039)		
Real GDP growth		0.002*** (0.0004)	0.001*** (0.0005)	0.001*** (0.0005)	0.001*** (0.0005)	0.001** (0.0005)	0.002*** (0.0005)	0.002*** (0.0005)	0.002*** (0.0005)	0.002*** (0.0005)	0.002*** (0.0005)	0.002*** (0.0005)	0.002*** (0.0005)	0.001* (0.0005)	0.000 (0.0005)	0.000 (0.0005)	0.001 (0.0006)	0.001 (0.0005)	0.001 (0.0005)	0.001 (0.0005)	0.001 (0.0005)	0.001 (0.0005)	0.001 (0.0006)	0.001 (0.0006)	0.001 (0.0006)	0.001 (0.0006)	0.001 (0.0005)	
Debt service-to-exports			0.000* (0.0002)	0.000 (0.0002)	0.000 (0.0002)	0.000 (0.0002)	-0.000 (0.0002)	0.000 (0.0002)	0.000 (0.0002)	0.000 (0.0002)	0.000 (0.0002)	0.000 (0.0002)	0.000 (0.0002)	0.000 (0.0002)	0.001** (0.0002)	0.001*** (0.0002)	0.001*** (0.0002)	0.000* (0.0002)	0.000 (0.0002)	0.000 (0.0002)	0.000 (0.0002)	0.000 (0.0002)	0.000 (0.0002)	0.000 (0.0002)	0.000 (0.0002)	0.000 (0.0002)	0.000 (0.0002)	0.000 (0.0002)
Reserves-to-imports				0.000** (0.0001)	0.000*** (0.0001)	0.000*** (0.0001)	0.000* (0.0001)	0.000** (0.0001)	0.000** (0.0001)	0.000** (0.0001)	0.000** (0.0001)	0.000** (0.0001)	0.000 (0.0001)	0.000 (0.0001)	-0.000 (0.0001)	-0.000 (0.0001)	-0.000 (0.0001)	-0.000 (0.0001)	-0.000 (0.0001)	0.000 (0.0001)	0.000 (0.0001)	0.000 (0.0001)	0.000 (0.0001)	0.000 (0.0001)	0.000 (0.0001)	0.000 (0.0001)	0.000 (0.0001)	0.000 (0.0001)
External debt-to-GDP				-0.000*** (0.0000)	-0.000*** (0.0000)	-0.000*** (0.0000)	-0.000*** (0.0000)	-0.000*** (0.0000)	-0.000*** (0.0000)	-0.000*** (0.0000)	-0.000*** (0.0000)	-0.000*** (0.0000)	-0.000*** (0.0000)	-0.000*** (0.0000)	-0.000*** (0.0001)	-0.000*** (0.0001)	-0.000*** (0.0001)	-0.000*** (0.0001)	-0.000*** (0.0001)	-0.000*** (0.0001)	-0.000*** (0.0001)	-0.000*** (0.0001)	-0.000*** (0.0001)	-0.000*** (0.0001)	-0.000*** (0.0001)	-0.000*** (0.0001)	-0.000*** (0.0001)	-0.000*** (0.0001)
Parliamentary democracy					0.013 (0.0101)	-0.009 (0.0102)	-0.005 (0.0106)	-0.005 (0.0105)	-0.008 (0.0109)	-0.008 (0.0109)	-0.013 (0.0109)	-0.014 (0.0111)	-0.012 (0.0105)	0.006 (0.0105)	0.007 (0.0105)	0.007 (0.0112)	0.009 (0.0113)	0.001 (0.0111)	-0.007 (0.0101)	-0.007 (0.0101)	-0.010 (0.0110)	-0.010 (0.0110)	0.016 (0.0125)	0.013 (0.0123)	0.013 (0.0123)	0.021 (0.0135)		
Real GDP per capita						0.000*** (0.0000)	0.000*** (0.0000)	0.000*** (0.0000)	0.000*** (0.0000)	0.000*** (0.0000)	0.000*** (0.0000)	0.000*** (0.0000)	0.000*** (0.0000)	0.000* (0.0000)	0.000 (0.0000)	0.000 (0.0000)	0.000 (0.0000)	0.000 (0.0000)	0.000 (0.0000)	0.000 (0.0000)	0.000 (0.0000)	0.000 (0.0000)	0.000 (0.0000)	0.000 (0.0000)	0.000 (0.0000)	0.000 (0.0000)	0.000 (0.0000)	0.000 (0.0000)
Financial development								0.000 (0.0002)	0.000 (0.0002)	0.000 (0.0002)	0.000 (0.0002)	0.000 (0.0002)	0.000 (0.0002)	0.000 (0.0002)	-0.000 (0.0001)	0.000 (0.0001)	-0.000 (0.0001)	0.000 (0.0002)	-0.000 (0.0001)	-0.000 (0.0001)	-0.000 (0.0001)	0.000 (0.0001)	-0.000 (0.0002)	-0.000 (0.0002)	-0.000 (0.0002)	-0.000 (0.0002)	-0.000 (0.0002)	-0.000 (0.0002)
Election								0.004 (0.0052)	0.003 (0.0052)	0.003 (0.0052)	0.002 (0.0051)	0.003 (0.0051)	0.004 (0.0050)	0.001 (0.0050)	0.001 (0.0050)	0.001 (0.0051)	0.000 (0.0051)	0.002 (0.0051)	0.001 (0.0046)	0.001 (0.0046)	-0.001 (0.0047)	-0.004 (0.0045)	-0.004 (0.0046)	-0.004 (0.0046)	-0.008* (0.0046)			
Years left in current term								0.000 (0.0000)	0.000 (0.0000)	0.000 (0.0000)	0.000 (0.0000)	0.000 (0.0000)	0.000 (0.0000)	0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	0.000 (0.0000)
Government polarization											-0.000*** (0.0000)	-0.000*** (0.0000)	-0.000*** (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)
Checks and balances												0.002 (0.0013)	0.003** (0.0013)	0.002* (0.0012)	0.001 (0.0012)	0.001 (0.0012)	0.002 (0.0012)	0.002 (0.0012)	0.001 (0.0012)	0.002** (0.0012)	0.002** (0.0012)	0.002** (0.0013)	0.001 (0.0011)	0.001 (0.0011)	0.001 (0.0011)	0.000 (0.0011)	0.000 (0.0011)	
Real exchange rate													-0.000*** (0.0000)	-0.000*** (0.0000)	-0.000*** (0.0000)	-0.000*** (0.0000)	-0.000*** (0.0000)	-0.000*** (0.0000)	-0.000*** (0.0000)	-0.000*** (0.0000)	-0.000*** (0.0000)	-0.000*** (0.0000)	-0.000*** (0.0000)	-0.000*** (0.0000)	-0.000*** (0.0000)	-0.000*** (0.0000)	-0.000*** (0.0000)	
Exchange rate regime														-0.004*** (0.0008)	-0.005*** (0.0008)	-0.005*** (0.0008)	-0.005*** (0.0008)	-0.005*** (0.0007)	-0.005*** (0.0007)	-0.003*** (0.0007)	-0.003*** (0.0007)	-0.002** (0.0008)	-0.001 (0.0008)	-0.001 (0.0008)	-0.001 (0.0008)	-0.001 (0.0009)	-0.001 (0.0009)	
Inflation														-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	0.000 (0.0000)	0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	-0.000 (0.0000)	
Financial crisis														-0.007 (0.0049)	-0.006 (0.0050)	-0.005 (0.0049)	-0.005 (0.0048)	0.003 (0.0044)	0.004 (0.0045)	0.008* (0.0046)	0.010** (0.0045)	0.010** (0.0045)	0.010** (0.0045)	0.011** (0.0045)	0.011** (0.0046)			
Democracy																	-0.001 (0.0007)	-0.000 (0.0007)	-0.000 (0.0007)	-0.001 (0.0007)	-0.001 (0.0007)	-0.001** (0.0007)	-0.002** (0.0007)	-0.002** (0.0007)	-0.001 (0.0008)	-0.001 (0.0008)	-0.001 (0.0008)	
Trade openness																		-0.001*** (0.0001)	-0.000*** (0.0001)	-0.000 (0.0001)	-0.000 (0.0001)	-0.000 (0.0001)	-0.000** (0.0001)	-0.000* (0.0001)	-0.000* (0.0002)	-0.000** (0.0002)		
Current account balance																				-0.003*** (0.0005)	-0.002*** (0.0004)	-0.002*** (0.0004)	-0.002*** (0.0004)	-0.002*** (0.0004)	-0.002*** (0.0004)	-0.002*** (0.0004)	-0.002*** (0.0005)	
Financial openness																					0.031*** (0.0025)	0.031*** (0.0025)	0.031*** (0.0025)	0.026*** (0.0027)	0.026*** (0.0026)	0.019** (0.0027)		
Sovereign CDS dummy																					0.006 (0.0068)	0.002 (0.0068)	0.002 (0.0066)	0.009 (0.0068)	-0.005 (0.0065)			
Growth volatility																						-0.001 (0.0010)	-0.002* (0.0010)	-0.002* (0.0010)	-0.001 (0.0011)			
Gini index (market)																							0.006*** (0.0016)	-0.009 (0.0053)	-0.004 (0.0054)			
Gini index (net)																									0.014*** (0.0050)	0.012** (0.0052)		
Education																										0.020*** (0.0057)		
Observations	2023	1955	1669	1589	1583	1583	1390	1366	1366	1363	1362	1335	1335	1289	1189	1189	1156	1154	1154	1146	1146	1026	959	959	825			
R <sup>2</sup>	0.855	0.866	0.868	0.877	0.880	0.880	0.883	0.885	0.885	0.885	0.885	0.893	0.893	0.893	0.909	0.909	0.909	0.911	0.913	0.930	0.930	0.927	0.929	0.930	0.931			

Note: unreported constant included. Standard errors in parentheses. \*\*\*  $p \leq 0.01$ , \*\*  $p \leq 0.05$ , \*  $p \leq 0.1$ . Time and country fixed effects are included in each specification.

Figure A1: Average number of conditionality by categories



Source: authors' illustration based on data from Kentikelenis et al. (2016).



Table A4: Structural reforms dimensions description

Reforms	Dimension	Dimension description	Aggregate measure descriptions
Domestic finance	[1] Credit controls	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	Aggregate index on domestic finance regulations is a composite of the six sub-indicators
	[2] Interest rate controls	It captures government interventions in setting deposit and lending rates.	
	[3] Bank entry barriers	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	
	[4] Banking supervision	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.	
	[5] Privatization	It captures the market shares of state-owned banks in the domestic financial system.	
External finance (Capital account)	[6] Security market development	It considers whether a country has taken measures to develop securities markets.	Aggregate index of external finance is a composite of an index on capital outflow restrictions and an index on capital inflow restrictions
	[1] Foreign direct investment	It quantifies the degree of government restrictions on exchange payments (receipts) of capital classified as FDI outflows (inflows).	
	[2] Portfolio investment	It quantifies the degree of government restrictions on exchange (receipts) payments of capital classified as portfolio equity outflows (inflows)	
	[3] Bond market	It quantifies the degree of government restrictions on exchange payments (receipts) of capital through transactions of bonds or other debt securities.	
	[4] Money markets	It quantifies the degree of government restrictions on exchange payments (receipts) of capital through transactions of money market instruments.	
Product market	[5] Finance and lending markets	It quantifies the degree of government restrictions on exchange payments (receipts) of capital through financial credits.	Aggregated index is constructed as the sum of two sub-indicators (telecommunication and electricity) and is normalized from zero to one.
	[1] Access (Telecommunication)	It captures the degree of government intervention in the access to electricity.	
	[2] Competition (Telecommunication)	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)	
	[3] Regulation (Telecommunication)	It examines whether there is an independent regulatory agency	
	[4] Ownership (Telecommunication)	It quantifies the extent of state-owned firms in the market	
Trade	[1] Wholesale (Electricity)	It examines whether there is a liberalized wholesale market	Aggregated index of trade openness is the simple average of an aggregated index on tariff rates and an aggregated index on current account transactions
	[2] Unbundling (Electricity)	It captures the degree of vertical integration in the market that is, whether generation, transmission, and distribution are unbundled	
	[3] Regulation (Electricity)	It examines whether there is an independent regulatory agency.	
	[4] Ownership (Electricity)	It quantifies the extent of state-owned firms in the market.	
	[1] Tariff rates	It provides the simple average tariff rates across products.	
Labour market reforms (LMR)	[2] Current account transactions	It quantifies the degree of government restrictions on the payments for external trade.	Aggregated index is constructed as the sum of the five subindicators and is normalized from zero to one.
	[1] Valid grounds	It captures the freedom of the employer in deciding when to dismiss workers and which workers to dismiss.	
	[2] Procedural inconvenience	It includes provisions such as consultation with workers' representatives and third-party approval.	
	[3] Firing costs	It consists of minimum notice periods and severance payments.	
	[4] Redress measures	It concerns provisions such as the possibility for the worker of being reinstated in employment or to receive a compensation following an unfair dismissal.	
	[5] Additional requirements for collective dismissals	It accounts for additional restrictions imposed to the employer when dismissing a large number of workers for economic reasons.	

Note: unreported constant included. Standard errors in parentheses. \*\*\*  $p \leq 0.01$ , \*\*  $p \leq 0.05$ , \*  $p \leq 0.1$ . Time and country fixed effects are included in each specification.

Table A5: Data sources

Variables	Sources
Structural reforms index	Alesina et al. (2020)
IMF conditionality	Kentikelenis et al. (2016)
Trade (% of GDP)	WDI
Foreign direct investment, net inflows (% of GDP)	WDI
Unemployment, total (% of total labour force)	WDI
Inflation (average consumer prices)	WDI
General government final consumption expenditure (% of GDP)	WDI
Unemployment, total (% of total labour force)	WDI
ICRG institutional quality	Teorell et al. (2020)
Gross fixed capital formation (% of GDP)	WDI
IMF programme dummy	Dreher (2006)
GDP growth (annual %)	WDI
Age dependency ratio, young (% of working-age population)	WDI
Reforms gap vis-à-vis of USA	Authors' calculation based on Kentikelenis et al. (2016)
Reform in neighbouring countries	Authors' calculation based on Kentikelenis et al. (2016)
Legislative or executive election	Database of Political Institutions 2020 (DPI2020)
Gini coefficient	UNU-WIDER (WIID Companion, version March 2021)
Cyclical component of GDP (output gap)	Authors' calculation based on WDI
Human capital index	PTW

Table A6: Countries list (64)

Albania(ALB)	Dominican Republic(DOM)	Kyrgyzstan(KGZ)	Romania(ROU)
Algeria(DZA)	Ecuador(ECU)	Latvia(LVA)	Russia(RUS)
Argentina(ARG)	Egypt(EGY)	Lithuania(LTU)	Senegal(SEN)
Azerbaijan(AZE)	El Salvador(SLV)	Madagascar(MDG)	South Africa(ZAF)
Bangladesh(BGD)	Estonia(EST)	Malaysia(MYS)	Sri Lanka(LKA)
Belarus(BLR)	Ethiopia(ETH)	Mexico(MEX)	Tanzania(TZA)
Bolivia(BOL)	Georgia(GEO)	Morocco(MAR)	Thailand(THA)
Brazil(BRA)	Ghana(GHA)	Mozambique(MOZ)	Tunisia(TUN)
Bulgaria(BGR)	Guatemala(GTM)	Nepal(NPL)	Turkey(TUR)
Burkina Faso(BFA)	Hungary(HUN)	Nicaragua(NIC)	Uganda(UGA)
Cameroon(CMR)	India(IND)	Nigeria(NGA)	Ukraine(UKR)
Chile(CHL)	Indonesia(IDN)	Pakistan(PAK)	Uruguay(URY)
China(CHN)	Jamaica(JAM)	Paraguay(PRY)	Uzbekistan(UZB)
Colombia(COL)	Jordan(JOR)	Peru(PER)	Venezuela(VEN)
Costa Rica(CRI)	Kazakhstan(KAZ)	Philippines(PHL)	Vietnam(VNM)
Cote d'Ivoire(CIV)	Kenya(KEN)	Poland(POL)	Zimbabwe(ZWE)

Note: country codes in parentheses.