WP/20/195

IMF Working Paper

The Macroeconomic Effects of Structural Reforms in Latin America and the Caribbean

by Antonio C. David, Takuji Komatsuzaki, and Samuel Pienknagura

INTERNATIONAL MONETARY FUND

 WP/20/195

IMF Working Paper

Western Hemisphere Department

The Macroeconomic Effects of Structural Reforms in Latin America and the Caribbean[1]

Prepared by Antonio C. David, Takuji Komatsuzaki, and Samuel Pienknagura

Authorized for distribution by Jorge Roldos

September 2020

Abstract

This paper estimates the macroeconomic effects of structural reforms in Latin America and the Caribbean (LAC) using the dataset constructed by Alesina et al. (2020). We find that large changes in the reform index have positive effects on GDP and employment that reach 2 percent after 5 years. Furthermore, reforms boost investment, exports, imports, and reduce export concentration, in addition to favoring tradable sectors. Nonetheless, the results also indicate that the effects of reforms have not been uniform across different segments of the population. These findings bring to the forefront the need to consider accompanying policies to ensure that reforms promote inclusive growth. Moreover, evidence from country case studies using the synthetic control method point to heterogeneous effects of reforms on income per capita.

JEL Classification Numbers: E20, O11, O40

Keywords: Structural Reforms, Latin America, Macroeconomic Effects.

Author's E-Mail Address: adavid@imf.org, TKomatsuzaki@imf.org, spienknagura@imf.org

[1] We thank Chris Papageorgiou for kindly sharing the dataset on structural reforms. We are also grateful to Romain Duval, Dmitry Gershenson, and Jorge Roldos for helpful comments. Genevieve Lindow provided outstanding research assistance.

I. INTRODUCTION

Economic growth in Latin America and the Caribbean (LAC) has been sluggish for a prolonged period, even before countries in the region faced the major disruptions caused by COVID-19. Labor and total factor productivity growth have lagged other emerging markets and developing economies. This is in part linked to significant structural constraints, including inadequate infrastructure, high levels of informality, low levels of human capital, and weak governance (Bakker et al., 2020).

The COVID-19 shock will further depress economic activity in the region and puts a premium on policies that secure a sustained recovery and higher long-term growth in the aftermath of the crisis. The policy response to the shock entailed significant government interventions to contain the pandemic and mitigate its economic effects. The unprecedented scale of the shock often engendered policy actions of historical proportions in terms of size and scope encompassing the fiscal, monetary, and financial areas. These extraordinary and often unorthodox policy measures were typically announced as being temporary actions to prevent an economic collapse. But these policies are not necessarily suited to tackle the region's longstanding growth challenges. Thus, as policy makers are setting the stage to sustain the economic recovery, this might be an opportune moment to implement structural reforms to tackle the fundamental distortions that were hindering productivity growth before the crisis.

In the past, countries in the region have undertaken important efforts to liberalize key markets, particularly over the 1990s and 2000s (as illustrated in the next section). These efforts were followed by reform "fatigue"—and, in some cases, reversals. Could this pattern be partly grounded in a perception by the general public and policy makers that reforms failed to deliver? Does the empirical evidence validate such perceptions regarding disappointing gains from past reforms? Or have reforms in fact delivered positive outcomes, but not for all segments of the population?

This paper will tackle some of these questions. It assesses the effects of specific reforms, namely trade, product, labor market[2], and domestic financial liberalization, on key macroeconomic and social variables with a focus on LAC countries. It is related to recent studies, such as Alesina et al. (2020) and IMF (2019), that estimate the effects of structural reforms on economic growth in emerging markets and developing economies. Compared to these studies, this paper zooms into key transmission channels through which reforms affect growth over the short to medium-term, including channels that have not been analyzed before, namely total investment and foreign direct investment, and business confidence. Also, structural reforms with significant negative effects on inequality and poverty are

[2] More specifically, we consider reforms to employment protection legislation, which is one among many other types of labor market reforms.

unlikely to be sustainable. Therefore, the paper also studies the potential "collateral damage" of reforms.

Using the structural reform index proposed by Alesina et al. (2020), the paper finds that large changes in the index (towards reforms) have positive effects on GDP and employment in LAC countries that reach 2 percent after 5 years. Nonetheless, the results also suggest that reforms have had economically small, but statistically significant adverse effects on inequality and poverty.

The positive effects of reforms on aggregate growth appears to operate through specific channels, namely higher investment and *de facto* openness. Reforms boost investment, real exports, real imports, and reduce export concentration, in addition of favoring tradable sectors. Structural reforms also increase total factor productivity, but their effects are more imprecisely measured. The evidence on the effects of reforms on business confidence is more mixed. There is also evidence of complementarities between reforms. While the effects of the aggregate reform index do not vary much with the state of the economy, reforms in certain dimensions appear to have larger effects when they are implemented during booms.

Country case studies using the synthetic control method indicate heterogeneous results. A counterfactual analysis of intense structural reform periods for Chile, Colombia, and Mexico shows that the reforms have led to superior growth performance in Chile, but not in Colombia and Mexico. In addition to the degree of advancement of structural reforms, other factors such as microeconomic distortions and macroeconomic stability may explain this heterogeneity.

This paper is related to a longstanding literature studying the state of the structural reform agenda in developing countries and its effects on growth (see Zettelmeyer, 2006, for a summary of the effects of reforms in LAC). It is closely linked to IMF (2019) and Alesina et al. (2020), which studies the effects of structural reforms on growth and informality in a large set of countries. This paper expands their analysis by zooming into some of the potential channels through which reforms may affect growth and focuses exclusively on LAC countries. As in Lora (2012) and IMF (2019), the analysis here unbundles the state of the reform agenda along different dimensions. Doing so allows us to study the differential effects of specific reform areas on GDP and other variables of interest.

In this regard, the paper is also related to Biljanovska and Sandri (2018), who study the effects of different reforms on TFP growth in Brazil. This paper broadens the focus to a larger set of countries and focuses on the dynamic response of macroeconomic variables following reform episodes. The effects of reforms on economic development are also studied in Bergoeing et al. (2001). The authors compare the economic development path of Chile and Mexico in the 1980s and 1990s and argue that policy reforms implemented in Chile fostered faster productivity growth. The findings in Billimeier and Nannicini (2013) also provide

support to the link between reforms (liberalization) and growth, especially during the first wave of reforms of the 1980s. In addition, Prati, Onorato, and Papageorgiou (2013) find that while reforms are positively associated with higher growth on average, this link is highly heterogeneous and seems to be influenced by a country's institutions and distance from the technology frontier.

The paper is structured as follows. Section II presents some stylized facts about structural reforms (i.e. domestic finance, product, trade, and employment protection reforms) in LAC since the 1970s, including a discussion of drivers of reforms and public opinion surveys gauging support for reforms in the region. Section III quantifies the effects of reforms on GDP, on employment and on total factor productivity. Subsequently we assess whether the effects of reforms vary with the state of the economic cycle and whether there are complementarities between reforms. This section also looks at a number of "transmission channels" that might mediate the effects of reforms on GDP, such as investment, FDI, informality, business confidence as well as external trade and the shares of different sectors in the economy. We also consider the effects of reforms on poverty and inequality. Subsequently, Section IV presents some case studies of structural reforms in LAC using the synthetic control method. Finally, Section V concludes.

II. Structural Reform Efforts in LAC since the 1970s

It is important to bear in mind that structural reform efforts are difficult to measure in a consistent manner across countries and time. This paper follows the approach of IMF (2019) and Alesina et al. (2020) by focusing on some specific aspects of structural reforms that aim to liberalize certain markets. The analysis is mostly based on the dataset on structural reforms constructed by Alesina et al. (2020), which was updated up to 2018 for the trade liberalization component. The dataset covers reforms implemented in 90 countries (68 Emerging Markets and Developing Economies-EMDEs- of which 17 LAC countries) over the period 1973-2014 at an annual frequency. The analysis that follows excludes Venezuela, which for some years has been embroiled in a deep humanitarian and economic crisis.

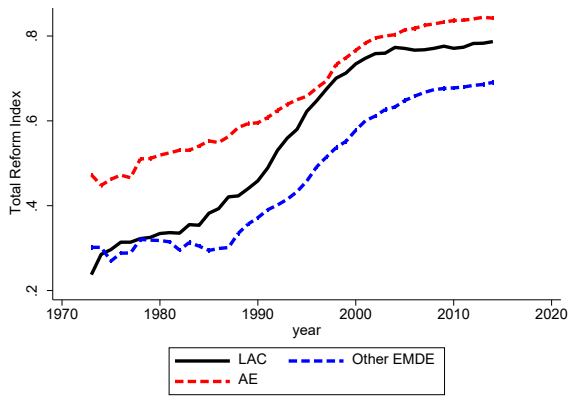
Using this data, we analyze reforms implemented in four broad areas: *i) Domestic finance*, the index for this area includes six dimensions of domestic finance regulation (credit controls, interest rate controls, entry barriers, supervision, privatization, and security markets development); *ii) Trade,* the index is based on average tariff levels*; iii) Product market,* the index considers liberalization and regulation in two network sectors (telecommunications and electricity) covering three broad areas (privatization, entry barriers, and supervision and regulation)*; iv) Labor market,* which provides a measure of employment protection legislation covering four areas (procedural requirements, firing costs, valid grounds for dismissal, and redress measures). IMF (2019) provides a description of the indicators and criteria used to build the reform indices along these four dimensions.

Figure 1 depicts an overall index of reforms in the region as the simple average of the four dimensions outlined above normalized to take a value between 0 and 1, with 1 being the most liberalized and better regulated. Data shows that the typical country in the region has undertaken substantial reforms over the 1990s and early 2000s, but reform impetus has stalled somewhat in more recent periods.

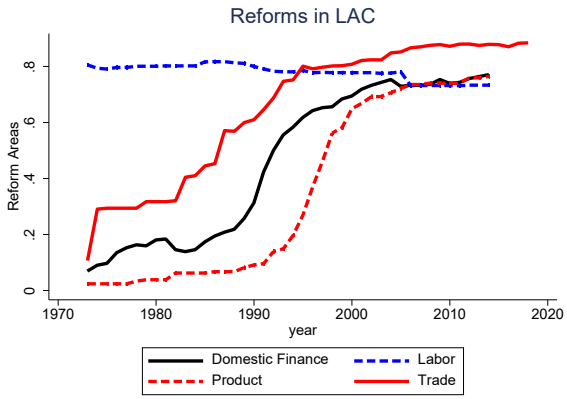
Despite notable progress, the region lags Advanced Economies (AE) for the overall index and in some reform dimensions. When considering specific reform areas, on average, countries in the region have taken steps to liberalize trade, product markets and domestic finance over the 1990s and 2000s, while reforms to employment protection legislation have been less frequent.[3]

Figure 1. Trends in the Structural Reforms Index

1. ***Regional Averages and Averages by Income Group***



2. LAC Average by Type of Reform

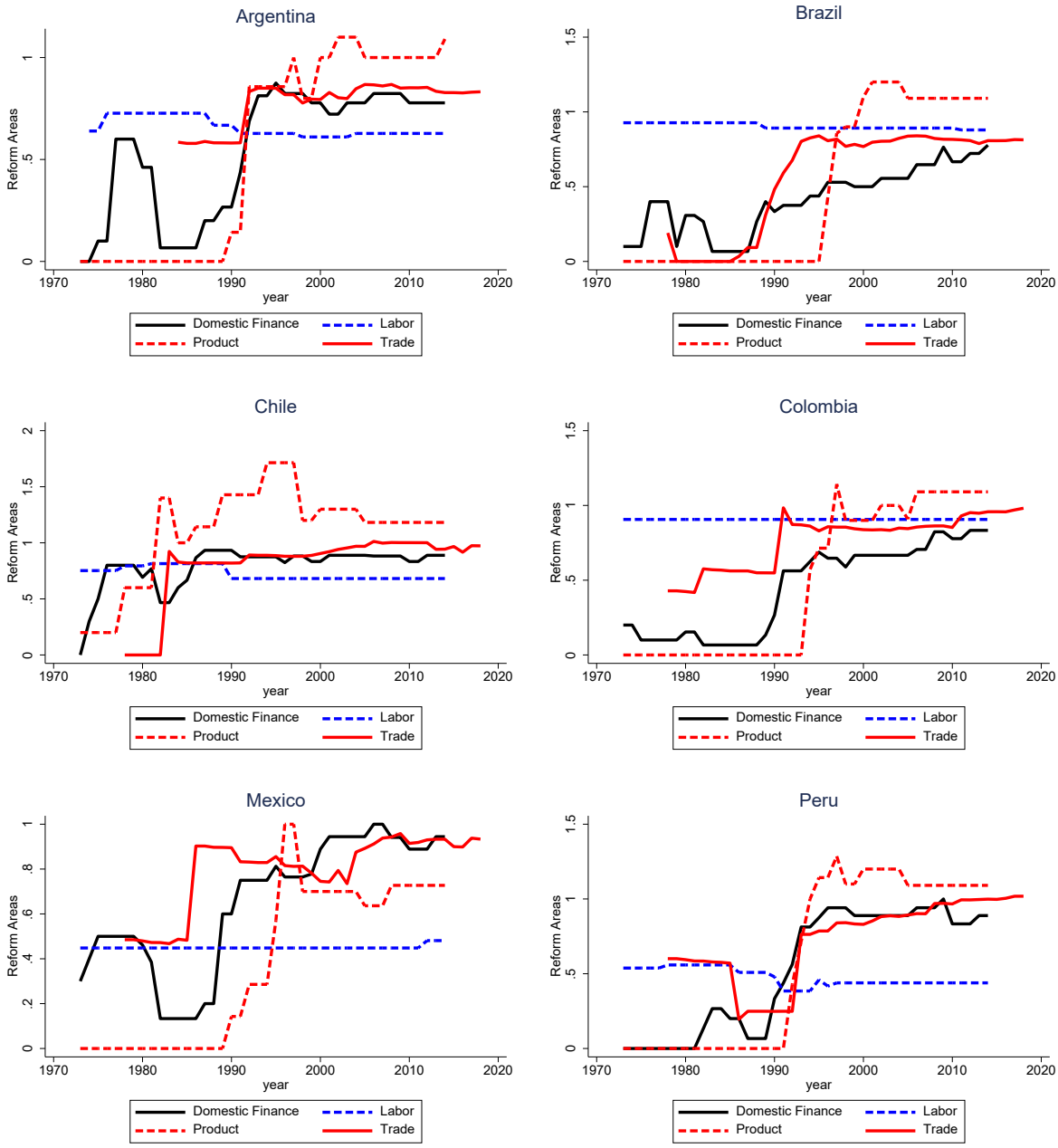


Excludes Venezuela.

Regional averages mask significant heterogeneity across countries. As illustrated in Figure 2, progress in terms of specific reform areas varies substantially across some of the largest economies in LAC. The Figure depicts the ratios of specific reform indexes in a given country relative to the United States, hence indicating whether a LAC country is more/less liberalized in one particular area. For example, Brazil still has ground to cover in terms of trade and domestic financial liberalization, while Mexico lags in the areas of labor and product market reforms. Moreover, several countries still seem to have particularly stringent employment protection legislation including Argentina, Chile, Mexico, and Peru.

[3] As explained in IMF (2019), by the nature of the indicators, one cannot directly compare a country's regulatory stance across different areas. All comparisons need to be made relative to other countries. Therefore, increases in the indices for the different areas point to steps taken towards liberalization, but it is not possible to claim, for example, that trade is more liberalized than labor markets just by directly comparing the levels of these indicators. For this reason, we turn to ratios relative to the United States next.

Figure 2. Ratios Relative to the United States for Different Reform Areas (Selected Countries)



What drives the implementation of reforms? From an empirical perspective, Da Silva et al. (2017) find that reforms are more likely during deep recessions and when the unemployment rate is high in a sample of 40 OECD and EU countries. Distance from the frontier ("best practices") is also an important empirical determinant of reforms. The presence of an IMF-supported program or other forms of external conditionality also facilitates reforms, but there is no clear link between fiscal policies and reforms. Prati, Onorato, and Papageorgiou (2013) also find for a broader sample of countries, some evidence that severe growth downturns are associated with subsequent reform upticks.

These findings are broadly confirmed by Duval, Furceri and Miethe (2020) in a sample of Advanced Economies for product and labor market reforms using Bayesian model averaging techniques. They find evidence to support the hypothesis that economic crises induce reforms and also conclude that there is reform convergence (countries with tighter regulation are more prone to liberalize). Reforms are also more likely when other countries also undertake them and when there is external pressure to implement them (such as during IMF-supported programs).

In contrast, Ciminelli et al. (2019), in a study for a broad sample of countries, find that during periods of low growth, reversals in reforms are relatively common. The effects of economic downturns on reforms also tend to vary depending on the reform area (IMF, 2019). Recessions foster trade, labor market, and domestic financial liberalization, but banking crises are linked to reversals in domestic and external financial liberalization.

For our sample of LAC economies, panel regressions with country and time fixed effects confirm some of these general findings (Table 1).[4] Changes in the structural reform indices are negatively associated with past levels of the index. This is an intuitive result, suggesting that reforms are less likely to take place if significant liberalization has already occurred and reform reversals are more likely for higher levels of the index. Reforms are also negatively linked to a dummy variable for recessions (defined as periods with a negative output gap, where trend output is estimated using an HP filter).

In addition, reforms are positively associated with IMF-supported programs in LAC countries (specification 1), especially domestic finance reforms. But this does not hold for the whole sample of countries. While there is no statistically significant association between the index for total reforms and a dummy variable for crises from the database built by Laeven and Valencia (2020) in the sample of LAC economies, reforms are negatively associated to crises when all countries are included. Moreover, domestic finance reforms are negatively related to the crises dummy for the sample of LAC economies.

Some of these conclusions are confirmed with logit models focusing on large reforms (one standard deviation changes in the reform index) with country and time-fixed effects. Average partial effects from these models indicate that the presence of an IMF-supported program increases the probability of a reform taking place by 13 percent in LAC countries (see Annex B).

[4] See Annex A for sources and definitions for the variables used throughout the paper.

Table 1. Fixed-Effects Panel Regressions of the Drivers of Reforms

	(1) Total Reforms LAC	(2) Total Reforms All	(3) Domestic Finance LAC	(4) Product Market LAC	(5) Trade LAC	(6) Labor All
Lagged level of index	-0.117***	-0.120***	-0.172***	-0.115**	-0.221***	-0.107***
	(0.0315)	(0.0216)	(0.0480)	(0.0437)	(0.0488)	(0.0364)
$(\text{GDP growth})_{t-1}$	-0.000282	-2.77e-05	0.000776	0.000848	-0.000582	-0.000212
	(0.000911)	(0.000191)	(0.000737)	(0.000781)	(0.00234)	(0.000297)
Terms of Trade Change	-0.000136	0.000382	0.000644	-0.000494	6.57e-05	0.000326
	(0.000660)	(0.000230)	(0.00201)	(0.000729)	(0.000729)	(0.000405)
$(\text{Terms of Trade Change})_{t-1}$	-0.00134	-0.000343	-0.00114	-0.000925	-0.000775	-0.000196
	(0.000818)	(0.000333)	(0.000972)	(0.00161)	(0.00175)	(0.000670)
IMF program dummy	0.0118***	0.00255	0.0234***	0.00303	0.0163**	-0.00203
	(0.00397)	(0.00239)	(0.00635)	(0.00436)	(0.00787)	(0.00146)
Recession dummy	-0.00484**	-0.00333*	0.00289	-0.00870*	-0.00687*	-0.000163
	(0.00222)	(0.00178)	(0.00349)	(0.00448)	(0.00380)	(0.00117)
Crises dummy	-0.00637	-0.00536***	-0.0267***	0.00296	-0.00142	-0.00265
	(0.00558)	(0.00169)	(0.00458)	(0.00612)	(0.0169)	(0.00536)
Constant	0.0435***	0.0507***	0.110***	0.0867***	0.0809***	0.0771***
	(0.00980)	(0.00820)	(0.0358)	(0.0317)	(0.0173)	(0.0261)
Observations	466	2,345	528	528	549	2,528
R-squared	0.244	0.158	0.358	0.284	0.244	0.0640
Number of countries	16	90	16	16	16	90

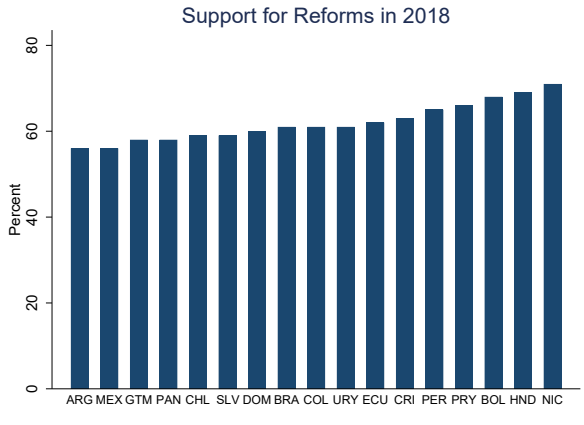
Driscoll-Kraay standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Is the decrease in the impetus for reform that set out in several countries in the region since the 2000s, partly grounded in a perception by the general public and policy makers that reforms failed to deliver? To illustrate this discussion, we follow Biljanovska and Sandri (2018) and use information from the *Latinobarómetro* public opinion surveys over several years to gauge support for reforms in the region. Overall support for structural reforms is proxied by the share of respondents in the surveys that express support for the market system by indicating whether they agree or strongly agree with the statement that: "*The market economy is the only system with which the country can become developed*".

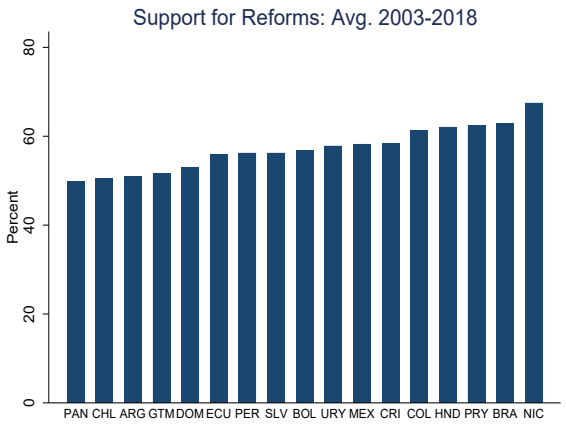
Figure 3 shows that there is broad support for market liberalization across countries in the region and support has remained fairly constant across the period 2003-2018. Nevertheless, the bottom two panels of the figure also indicate that a significant share of the population, between a quarter to a third of respondents, in several countries have expressed skepticism regarding the role of reforms, which is proxied by the share of respondents that disagree or strongly disagree with the statement.

Figure 3. Overall Support for Reforms

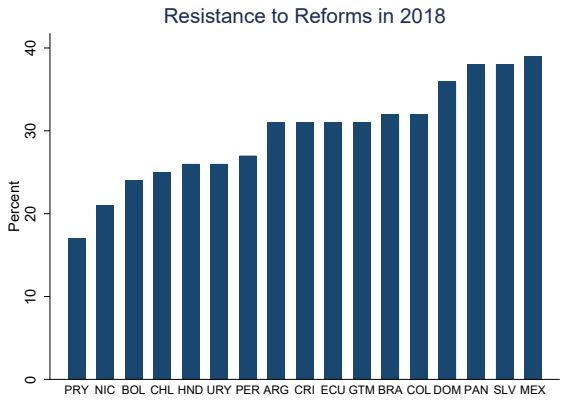
1. *Share of respondents expressing support for market system*



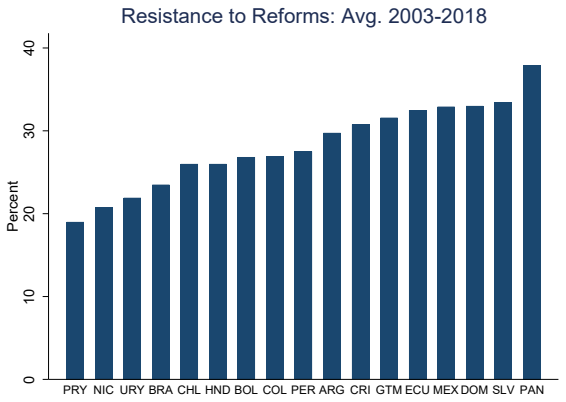
2. Average *share of respondents supporting market system*



3. *Share of respondents skeptical of market system*



4. Average *share of respondents skeptical of market system*



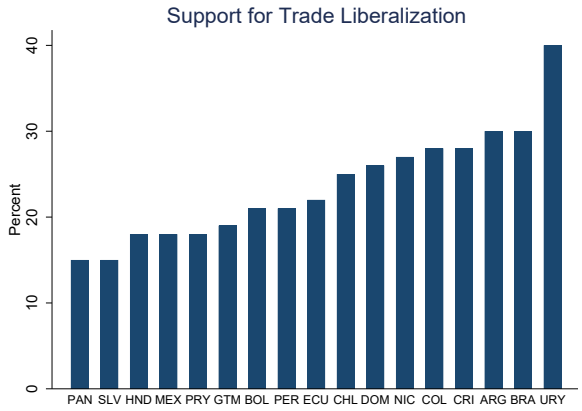
Source: *Latinobarometro.*

When considering specific reform areas, we can note that the share of respondents supporting trade liberalization is generally low across the region, but particularly so for countries in Central America and Mexico (Figure 4). Support for finance and product market reforms (proxied by the share of respondents supporting innovation and productivity following Biljanovska and Sandri, 2018) is higher than support for trade integration across the region, but it is particularly high in South American countries and Costa Rica.

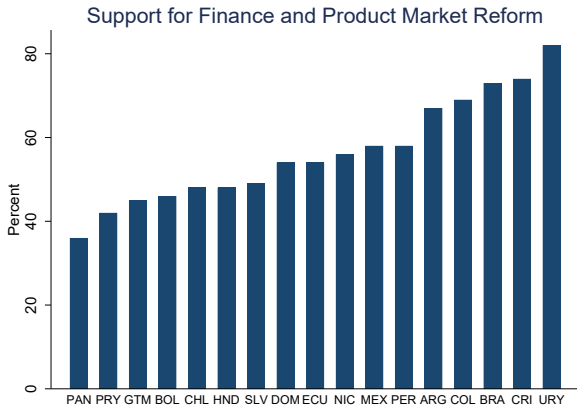
Therefore, while there is, in general, broad support for reforms across countries in the region, opinion surveys also suggest that a significant share of the population remains skeptical regarding the benefit of reforms, particular in areas such as trade liberalization. In that context, an empirical assessment of the economic effects of reforms becomes particularly relevant. We turn to this issue in the next section.

Figure 4. Support for Specific Reforms

1. Share supporting trade integration (2017)



2. Share supporting innovation and productivity (2017)



Source: *Latinobarometro.*

III. Quantifying the Effects of Structural Reforms

A. The Effects on Economic Growth, Employment, and Total Factor Productivity

Structural reforms are typically implemented to boost growth and employment. Whether this goal is achieved is ultimately an empirical question. With this in mind, this section studies the effects of structural reforms on real GDP, employment, and total factor productivity over the medium-term for the 16 LAC countries in the dataset using the local projection method. This procedure does not constrain the shape of the impulse response functions and is therefore less sensitive to misspecification than estimates of VAR models (Jordà and Taylor, 2016). The benchmark specification at an annual frequency is as follows:

$$y_{i,t+h} - y_{i,t-1} = \alpha_i^h + \gamma_t^h + \beta^h \Delta \mathrm{SR}_{i,t} + \delta X_{i,t} + \varepsilon_{i,t+h} \quad (1)$$

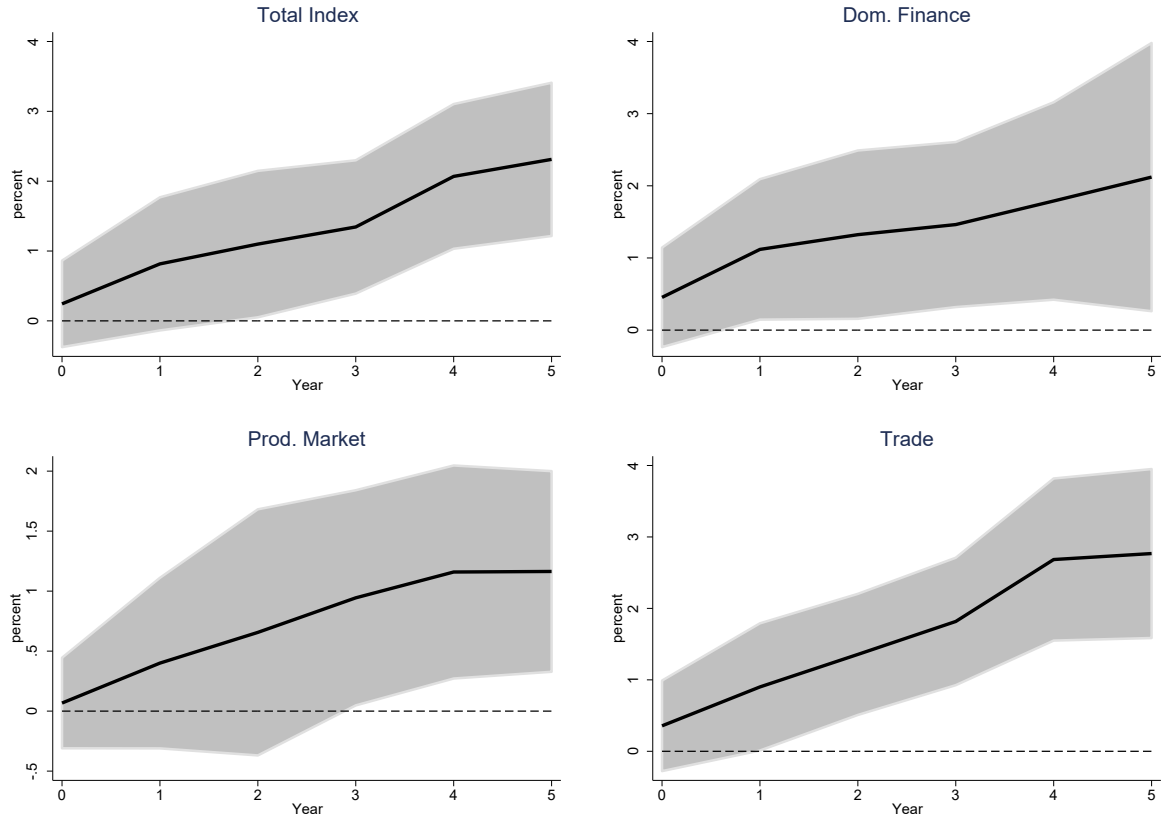
where y denotes the macroeconomic aggregate of interest (real GDP, employment, total factor productivity); $\mathrm{SR}_{i,t}$ denotes the structural reforms index; and h denotes the time horizons considered. $X_{i,t}$ denotes a set of control variables, which includes lagged values of the dependent variable and of the reform index as well as changes in the commodities terms of trade. The specification also includes time (γ_t^h) and country (α_i^h) fixed effects to capture common shocks and time-invariant country features, respectively.[5] We present impulse responses for large changes in the reform indexes (two standard deviations) in the Figures below. Annex A provides definitions and sources for the main variables used in the analysis.

[5] For specifications that consider specific reforms (rather than the total reform index) we also add as controls lagged values of the changes in the other reform indexes to control for complementarities. It is important to note that there are only 25 instances of non-zero changes for the labor reform indicator in LAC.

Figure 5 shows the results for large changes in the reform index on real GDP. Reforms in LAC countries have positive effects on GDP that reach 2 percent after 5 years (first panel of the Figure). This estimated magnitude of the effects of reforms are in line with the average findings of IMF (2019) for a broader set of EMDEs.

We also consider specifications for reforms in specific areas in which in addition to the control variables discussed in Equation 1, we add lagged changes of the other reform indicators to control for possible complementarities across reforms. Domestic finance reforms present a similar impulse response to the overall reform index, while product market reforms have positive effects on GDP that tend to take longer to materialize and are only statistically significant after two years. The effects of trade reforms on GDP are somewhat larger than the ones obtained for the overall index, reaching close to 3 percent after 5 years. The effects of labor market reforms on GDP for the sample of LAC countries are not statistically significant and it is not reported to save space.

Figure 5. Effects of Structural Reforms on Real GDP

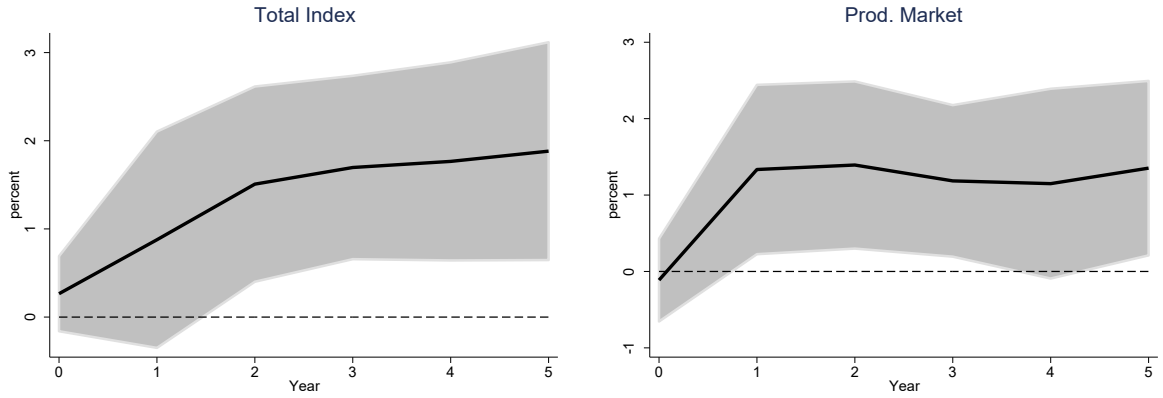


Shaded area is 90 percent confidence interval for Driscoll-Kraay standard errors.

Figure 6 presents the results of the effects of reforms on employment (defined as the log of employment in thousands of persons from the World Bank's World Development Indicators). Structural reforms also tend to boost employment in LAC countries with large changes in the total reform index being associated with increases in employment of about 2 percent after 5

years (hence similar in magnitude to the effects on GDP), even if such increases tend to take time to materialize. Product market reforms in particular are linked to statistically and economically significant increases in employment one year after implementation.

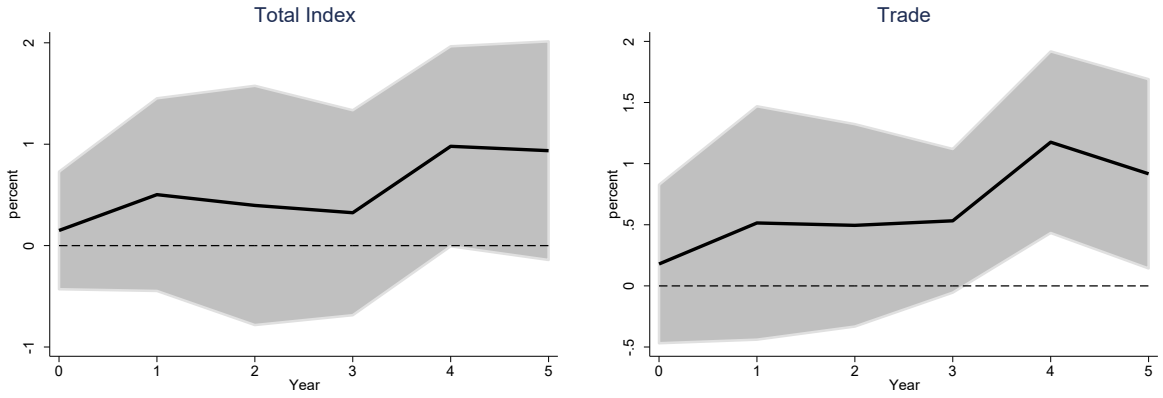
Figure 6. Effects of Structural Reforms on Employment



Shaded area is 90 percent confidence interval for Driscoll-Kraay standard errors.

We now turn to evidence on the effects of reforms on total factor productivity (TFP). We take the TFP measure directly from Feenstra, Inklaar, and Timmer (2015). The impulse responses depicted in Figure 7 show that reforms have a positive effect on TFP that is imprecisely measured for the total reform index (the confidence interval is wide). Nevertheless, when we focus on the trade reform index, the positive effects are statistically significant after two years, reaching about 1 percent after 5 years.

Figure 7. Effects of Structural Reforms on Total Factor Productivity



Shaded area is 90 percent confidence interval for Driscoll-Kraay standard errors.

Overall, we find that structural reforms that move towards greater liberalization can have positive effects on output and employment for countries in LAC, but these benefits tend to take time to materialize. There is also evidence of positive effects in terms of TFP, but these effects are not precisely estimated.

B. Do initial conditions matter?

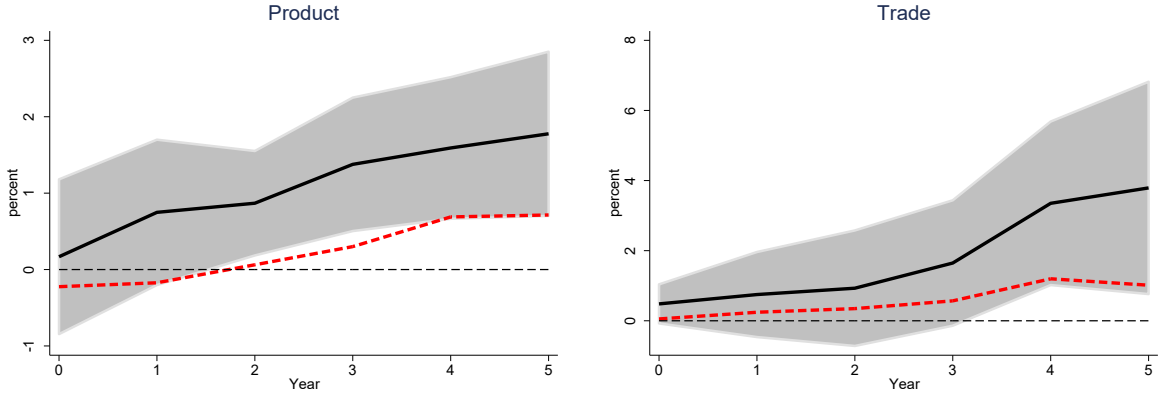
This section examines whether the baseline results change depending on conditions prevailing at the time of reform implementation. One of the main advantages of the local projection method in is its flexibility in dealing with non-linearities and state dependency. The typical state-dependent specification will take the following form, with $S_{i,t-1}$ being an indicator variable taking the value of 0 or 1 depending on the state-dependency being considered:

$$y_{i,t+h} - y_{i,t-1} = S_{i,t-1}\left[\alpha^h_{high,i} + \gamma^h_{high,t} + \beta^h_{high}\Delta \mathrm{SR}_{i,t} + \delta_{high}X_{i,t}\right] + (1 - S_{i,t-1})\left[\alpha^h_{low,i} + \gamma^h_{low,t} + \beta^h_{low}\Delta \mathrm{SR}_{i,t} + \delta_{low}X_{i,t}\right] + \varepsilon_{i,t+h} \quad (2)$$

We begin by analyzing if the effects of reforms change depending on whether they were implemented in periods of economic expansion ("boom"/"high") or contractions ("slump"/"low"). These periods were identified such that "boom" periods are years in which the output gap is positive (above trend with trend GDP being estimated using the HP filter) and conversely "slump" periods are years in which the output gap is negative.

While we do not find that the effects vary much according to the state of the economy for the index of total reforms in the sample of LAC economies, results differ for some specific reforms. In particular, for product markets and trade reforms, the effects on GDP are somewhat larger when they are implemented in boom times (Figure 8). This is somewhat different from the general findings of IMF (2019) for a large sample of EMDEs. That study found a marked contrast of the effects of reforms on GDP, if reforms were implemented in booms rather than recessions.

Figure 8. Effects of Structural Reforms on GDP Depending on the State of the Economy

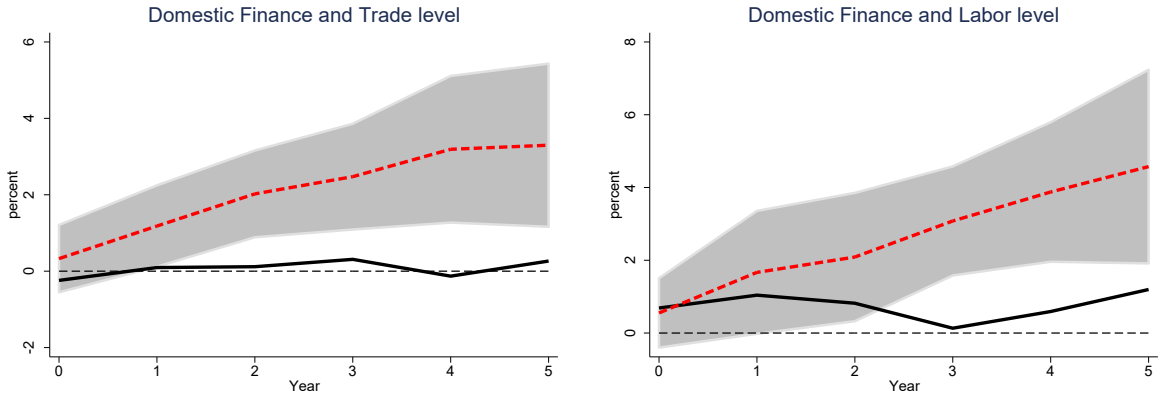


Shaded area is 90 percent confidence interval. Solid lines refer to the effects of reforms implemented during "boom" periods and dashed lines to the effects of reforms implemented during "slumps".

We also use the state-dependent specification outlined previously to explore the role of possible complementarities between the different reform areas. To do so, we condition the impulse responses for a given reform (say domestic finance) on whether the level of the reform index for other areas (trade, product market, and labor) is above or below the median for our sample of LAC countries in the year before the implementation of the reform of interest. Figure 9 depicts the results of this exercise for the effects of domestic finance reforms on GDP, conditioned on the level of trade liberalization and on the level of employment protection liberalization.

The impulse responses on the left-hand-side of the Figure show that domestic finance reforms in LAC countries have a positive effect on GDP, even when they are implemented at times when the economy is relatively more closed (i.e. conditioning on lower levels of the trade liberalization index). Moreover, as the right-hand-side panel of the Figure suggests, domestic finance reforms also have a positive effect on GDP even when labor markets are relatively rigid.

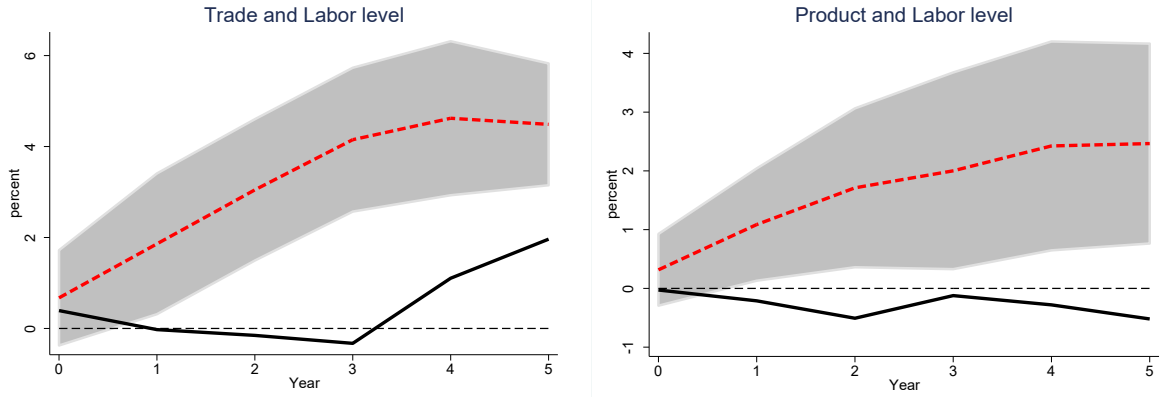
Figure 9. Effects of Domestic Finance Reforms on GDP Conditioned on the Level of Liberalization



Shaded area is 90 percent confidence interval. Solid lines refer to the effects of reforms implemented when the level of the index is "high" and dashed lines to the effects of reforms implemented during times when the level of the index is "low".

Taken together, these results indicate that positive payoffs of domestic finance reforms are not precluded by the presence of significant distortions in other areas (namely trade and labor markets). Similarly, as illustrated in Figure 10, the effects of trade liberalization on GDP are positive even when reductions in tariffs take place during times when employment protection legislation is relatively more rigid. In the first few years after trade reform implementation, it even appears that gains in terms of GDP are higher when the reform takes place under rigid employment protection legislation. In addition, the effects of product market reforms are also positive and significant even when implemented in periods of rigid employment protection legislation.

Figure 10. Effects of Trade and Product Market Reforms on GDP Conditioned on the Level of Labor Market Liberalization



Shaded area is 90 percent confidence interval. Solid lines refer to the effects of reforms implemented when the level of the index is "high" and dashed lines to the effects of reforms implemented during times when the level of the index is "low".

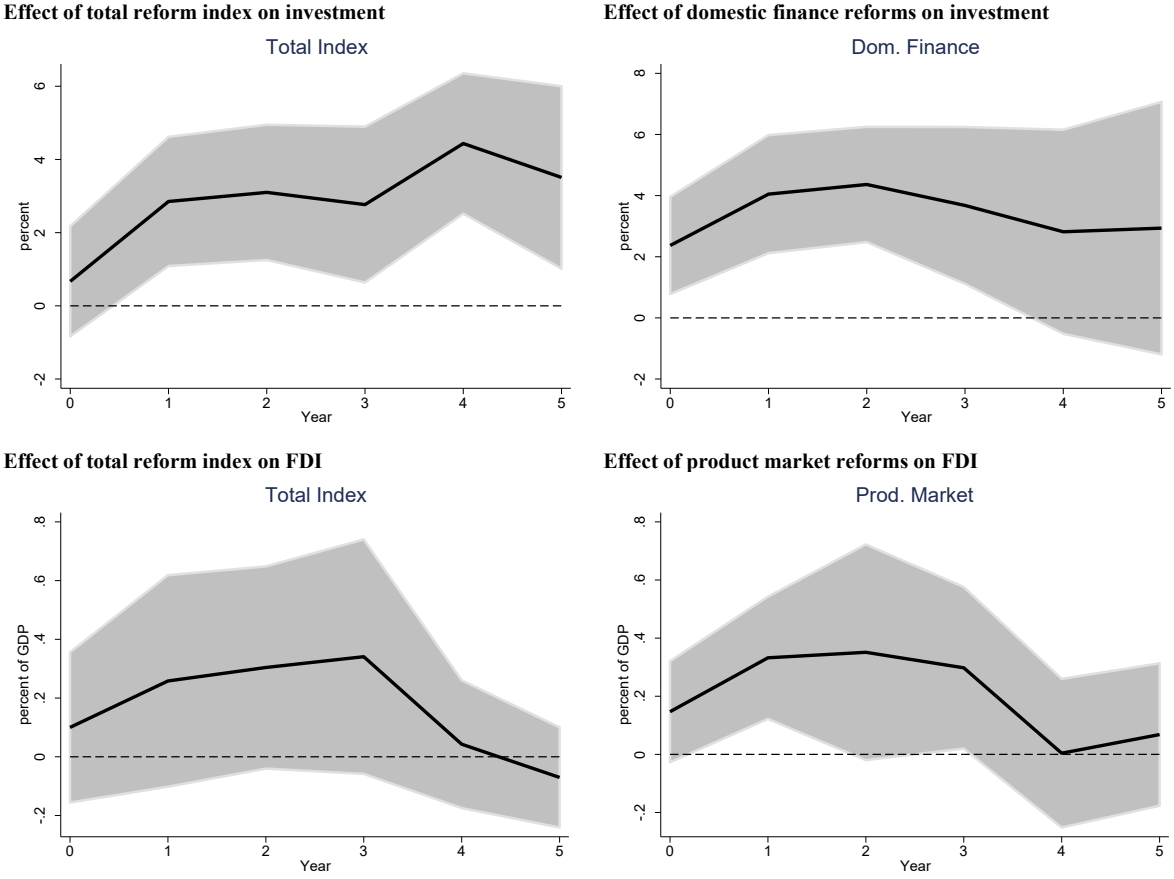
C. Inspecting the Mechanisms: Investment, FDI, Informality, and Confidence

This section considers the empirical effects of reforms on investment, FDI, informality as well as business confidence indicators using a similar specification to Equation 1. The purpose is to identify the mechanisms through which reforms affect GDP and employment. Typically, these channels have not received much attention in the literature on the effects of reforms.

Figure 11 presents the results of the effects of reforms on total investment (in log real terms) and foreign direct investment (as a share of GDP). Large changes in the total structural reforms index increase total investment by over 3.5 percent in a 5-year period. The effects of domestic finance reforms on investment are particularly apparent, leading to increases on impact of over 2 percent (but over the medium-term the confidence interval becomes wide and the effects are no longer statistically significant in this case).

Reforms also boost FDI although the effects tend to be economically small and only marginally significant from a statistical point of view (Bottom panels of Figure 11). In the particular case of product market reforms, the effects are statistically significant up to three years after the reform, but remain economically small with a two standard deviation change in the reform index being linked to an increase in FDI of a little more than 0.2 percent of GDP (and a peak increase of less than 0.4 percent of GDP).

Figure 11. Effects of Structural Reforms on Investment and FDI

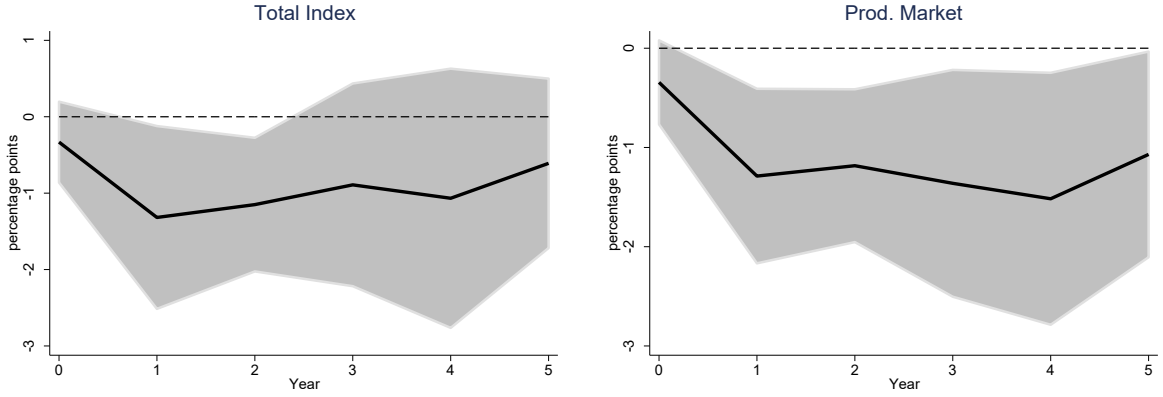


Shaded area is 90 percent confidence interval for Driscoll-Kraay standard errors.

LAC economies are marked by high levels of informality with important macroeconomic implications, including regarding the adjustment to shocks (David, Roldos, and Pienknagura, 2020). Therefore, the effects of structural reforms on informality are of particular policy relevance to the region. Figure 12 depicts how the informality rate (defined as the share of active workers not contributing to social security) responds to changes in the structural reforms index. Changes in the total reform index are associated with a decrease in informality, but it is not statistically significant over the medium-term.

Nevertheless, when we consider, product market reforms more specifically, the effects become statistically significant, albeit still economically small with large reforms reducing the informality rate by about one percentage point over 5-years. IMF (2019) also found that large reforms lead to a reduction in informality rates of the same magnitude (about 1 percent over a 5-year horizon) for a broader set of countries.

Figure 12. Effects of Structural Reforms on Informality Rate

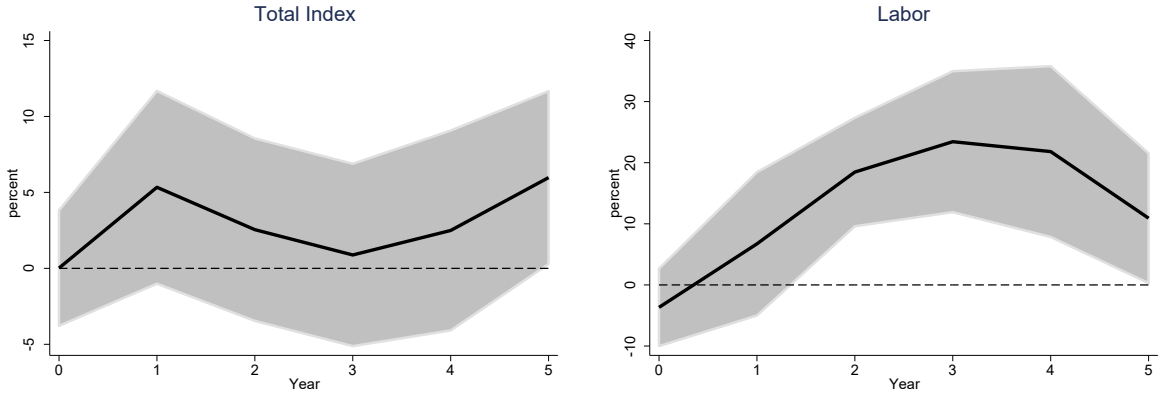


Shaded area is 90 percent confidence interval for Driscoll-Kraay standard errors.

Policymakers frequently argue that structural reforms have important effects on business confidence. Furthermore, it is argued that the boost in confidence associated with reforms could even offset the fiscal costs associated with their implementation. To tackle this question, we estimate impulse responses for an index of business confidence from Haver Analytics for a sample of 15 countries, which includes both advanced economies and emerging markets. We do not restrict ourselves to the sample of LAC economies in this case due to the limited data availability for the business confidence indicators for these economies (the index is only available in a comparable manner for Brazil, Chile, Mexico, and Peru).

Figure 13 presents impulse responses for changes in the total reforms index and in the employment protection index. Overall, the effects of large reforms on business confidence are not statistically significant. But, when focusing on reforms to job protection legislation, we find positive effects on confidence that take time to materialize and only become apparent two years after changes in the reform index occur (there are 43 changes in the labor reform index over the sample considered). Thus, the data does not seem to support the view that reforms lead to substantial immediate improvements in business confidence. Effects can be positive and significant, but seem to take time to materialize.

Figure 13. Effects of Structural Reforms on Business Confidence (14 Economies)

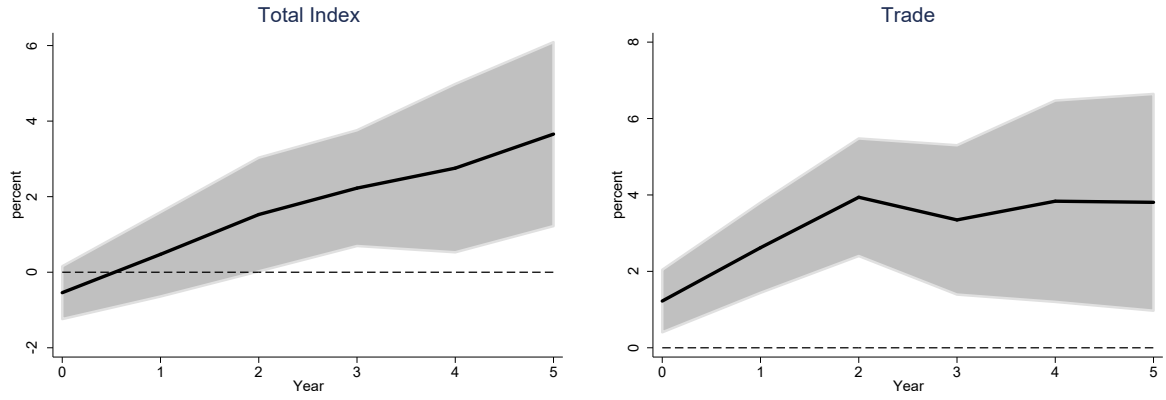


Shaded area is 90 percent confidence interval for Driscoll-Kraay standard errors.

D. Structural Reforms and External Trade

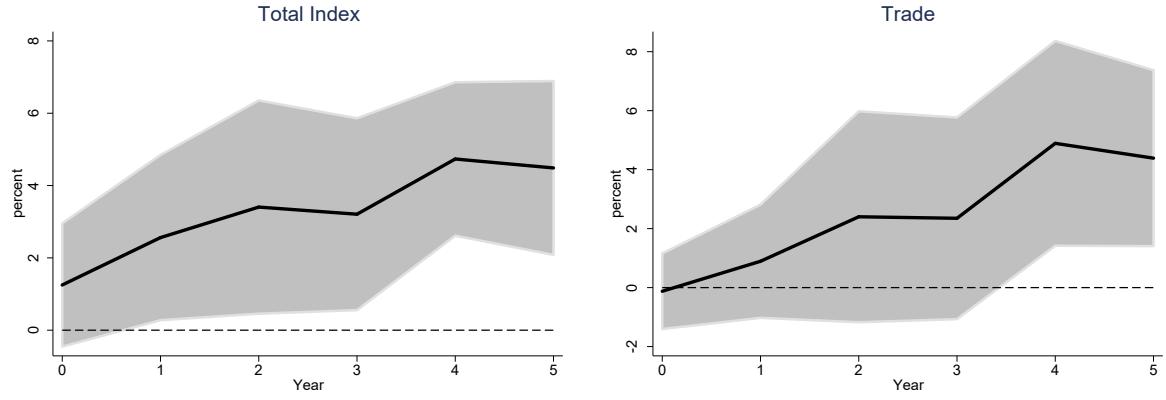
We now turn to the effects of reforms on external trade. Overall, reforms boost growth in real exports over the medium-term (Figure 14) and, naturally, the effects of trade liberalization are particularly prominent, even if other reforms such as product market liberalization (not shown) also increase real exports. Similarly, reforms increase real imports (Figure 15), but the effect of trade reforms seems to take somewhat longer to materialize in this case. These conclusions also hold when we consider the export and import to GDP ratios rather than the real variables, suggesting that the growth accelerations of exports and imports following reforms is larger than the acceleration of GDP growth.

Figure 14. Effects of Structural Reforms on Real Exports



Shaded area is 90 percent confidence interval for Driscoll-Kraay standard errors.

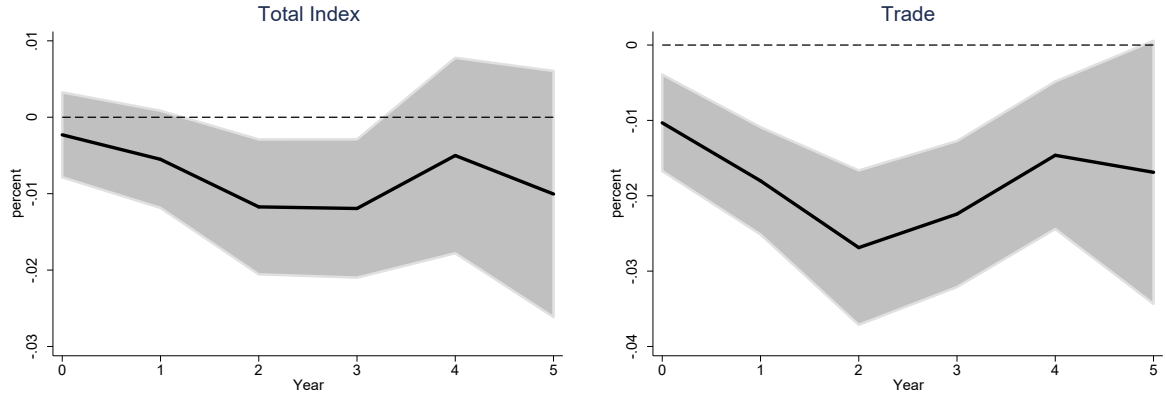
Figure 15. Effects of Structural Reforms on Real Imports



Shaded area is 90 percent confidence interval for Driscoll-Kraay standard errors.

Moreover, structural reforms also appear to contribute to export diversification (Figure 16). The Theil index for exports (a measure of concentration) declines after reforms, especially after trade liberalization. This supports an argument frequently advanced in the international trade literature that high tariffs introduce an anti-export bias in some sectors, which liberalization appears to remove.

Figure 16. Effects of Structural Reforms on Export concentration (Theil index)



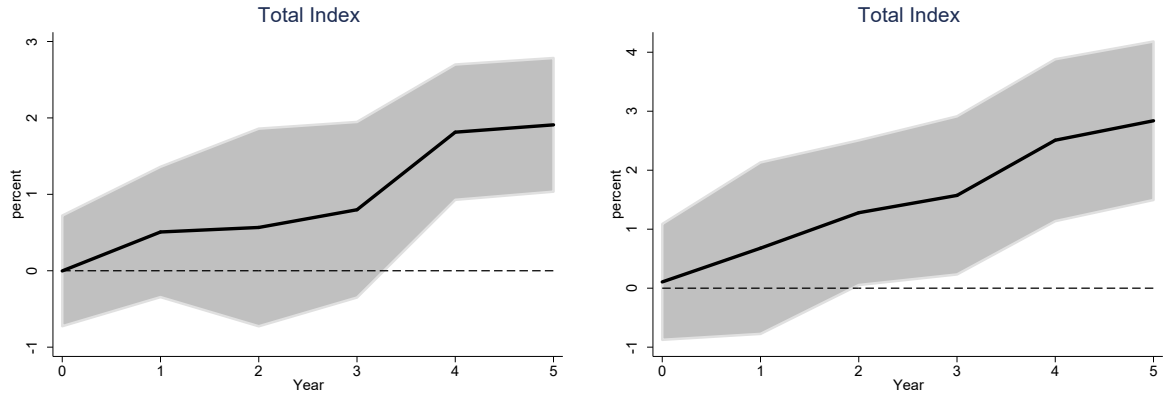
Shaded area is 90 percent confidence interval for Driscoll-Kraay standard errors.

E. The Sectoral Effects of Reforms

We turn to examine whether structural reforms affect disproportionately specific sectors relative to others. This could happen if reforms relax distortions/constraints that disproportionately affect some sectors. The results depicted in Figure 17 show that changes in the aggregate index of reforms lead to increased real value added in manufacturing and agriculture.

Figure 17. Effects of Structural Reforms on Agriculture and Manufacturing Value Added

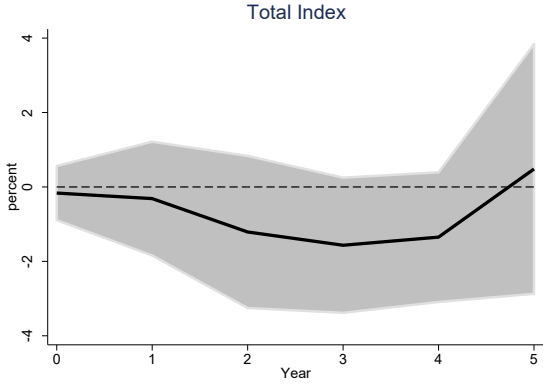
Effects on Agriculture **Effects on Manufacturing**



Shaded area is 90 percent confidence interval for Driscoll-Kraay standard errors.

By contrast, the effects of reforms on real value added in services are statistically not different from zero (Figure 18). This suggests that reforms tend to favor tradable sectors. As with GDP, the effects on manufacturing and agriculture value added tend to be significantly different from zero 2-3 years after the reforms are implemented.

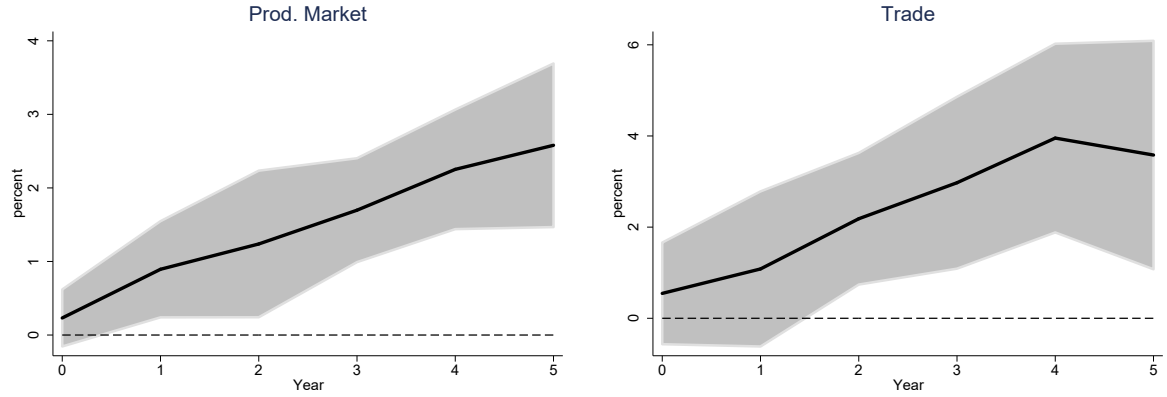
Figure 18. Effects of Structural Reforms on Services Value Added



Shaded area is 90 percent confidence interval for Driscoll-Kraay standard errors.

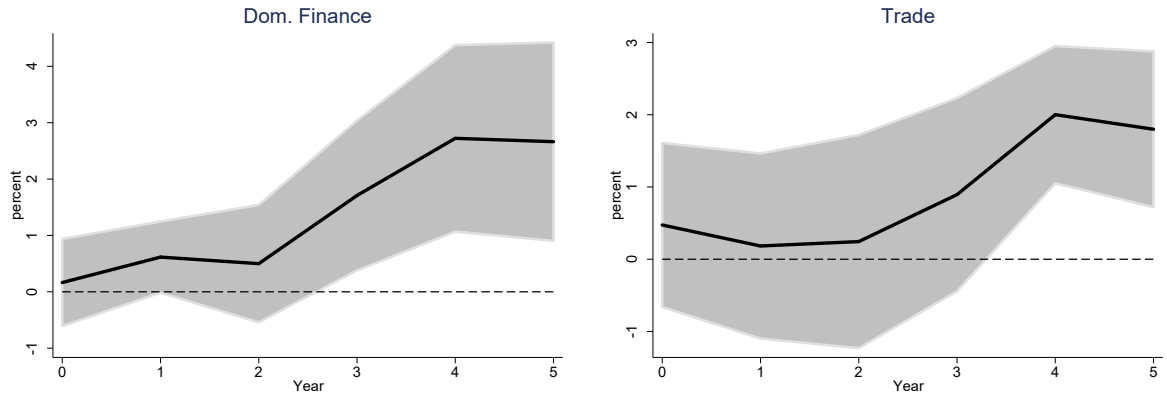
When we consider specific reform sub-indexes, it appears that each sector is affected by different reform clusters. Manufacturing value added increases after trade and product market reforms (Figure 19). In turn, agricultural value added and services value-added tends to increase following domestic finance and trade liberalization (Figures 20 and 21).

Figure 19. Effects of Structural Reforms on Manufacturing Value Added



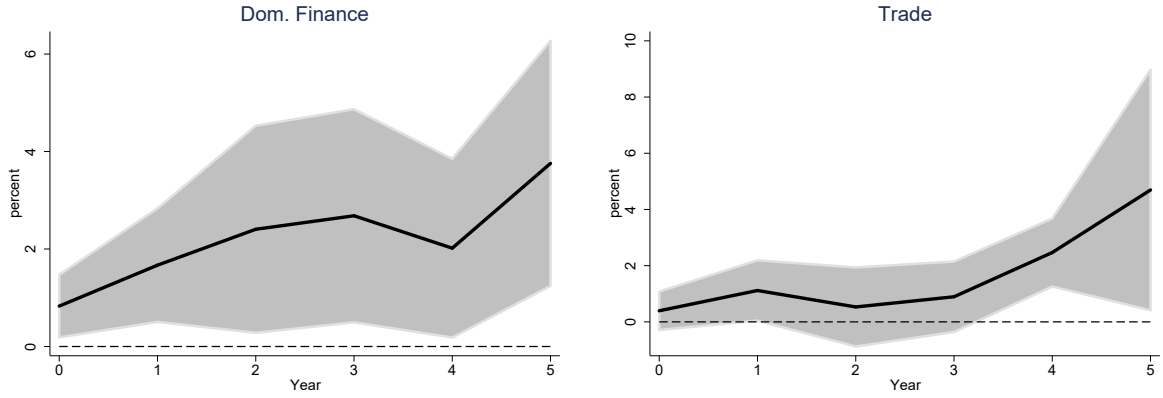
Shaded area is 90 percent confidence interval for Driscoll-Kraay standard errors.

Figure 20. Effects of Structural Reforms on Agriculture Value Added



Shaded area is 90 percent confidence interval for Driscoll-Kraay standard errors.

Figure 21. Effects of Structural Reforms on Services Value Added



Shaded area is 90 percent confidence interval for Driscoll-Kraay standard errors.

F. Collateral Damage? The Effects of Reforms on Poverty and Inequality

Structural reforms are likely to affect different segments of society in distinct ways, which may partly explain resistance to reforms and reversals. This section examines whether structural reforms might have deleterious effects over the short to medium term on inequality and poverty indicators in our sample of LAC countries using the same econometric framework outlined in previous sections. To measure the effects on the poverty rate, we use data on the poverty headcount ratio at $3.20 a day (2011 PPP terms) from the World Bank's World Development Indicators database. To assess the effects on inequality, we use the Gini index from the same source.

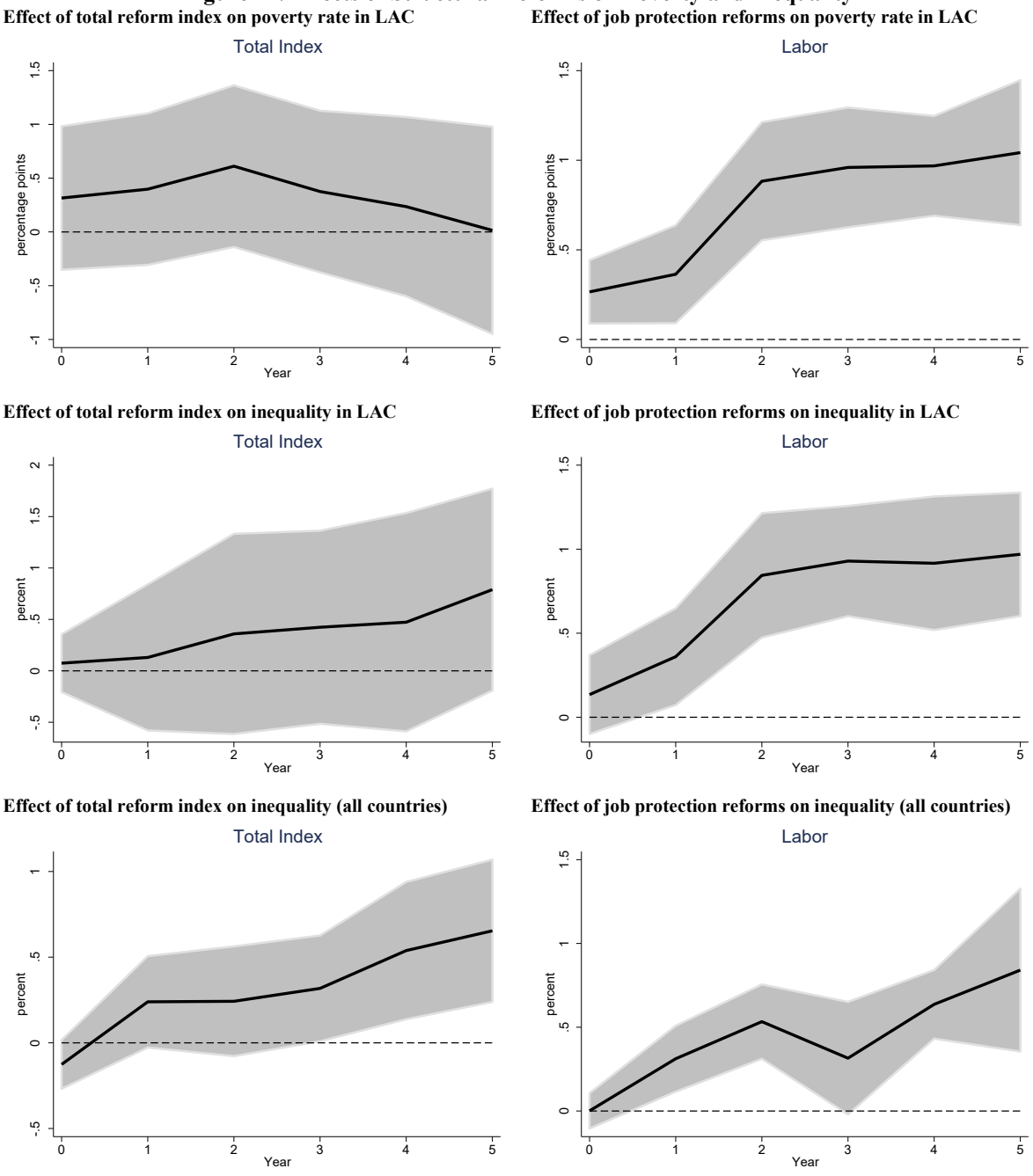
As illustrated in Figure 22, we do not find statistically significant effects for the total reforms index on poverty and inequality in our sample of LAC countries. Nevertheless, reforms to job protection legislation are associated with statistically significant increases in both poverty and inequality indicators over the medium-term. These effects appear to be economically small. Large changes in the employment protection reforms index lead to increases in poverty rates of about one percentage point over five years. Similarly, inequality increases by about 1 percent over the same period.

The bottom charts in the panel reproduce the inequality regressions for the full sample of countries and confirm some of the results obtained for LAC economies. In the case of total reforms, the deleterious effects on inequality are now statistically significant, but remain of similar magnitude to the ones reported for LAC over the medium-term.

Furceri and Rehman (2020) also report that reforms can be linked to increases in the Gini index when reforming countries have low intergenerational mobility and uneven access to opportunities, albeit the coefficients reported by these authors are smaller than the ones that we present in the case of employment protection reforms. Nevertheless, they argue that for

countries with high mobility and access to opportunities the correlation between reforms and inequality tends to be insignificant or negative.

Figure 22. Effects of Structural Reforms on Poverty and Inequality



Shaded area is 90 percent confidence interval for Driscoll-Kraay standard errors.

These results bring to the forefront the need to consider policy instruments to mitigate the potential negative effects of reforms, including measures to enhance access to opportunities. They strengthen the case for accompanying job protection liberalization with measures that

protect workers, such as extending unemployment insurance schemes, for example as discussed in Duval and Loungani (2019).

IV. Country Case Studies using the Synthetic Control Method

This section uses the synthetic control method (Abadie and Gardeazabal, 2003) to assess the effects of reforms in specific country cases. The synthetic control method is a data-driven way to construct a relevant counterfactual (i.e. the evolution of the macroeconomic variable had the reform not taken place). The method provides a systematic way to identify the control unit, which is selected as the linear combination of all potential comparison units that have similar characteristics to those of the country of interest before treatment. For each treated unit, the linear combination generates the control unit by an iterative optimization procedure, which matches the outcome variable and its determinants for the pre-intervention periods.[6] As the treated unit and the control unit are matched both in terms of the outcome and its determinants, the divergence in the outcome after the intervention started is interpreted as the effect of the intervention.

We chose Chile, Colombia, and Mexico as case studies. The outcome variable is real GDP per capita in PPP terms, and the predictor variables are the investment to GDP ratio, population growth, secondary school enrollment, annual inflation, a democracy dummy, the level of the reform index, and GDP per capita in 1973 and the last two years before the reform started, following Billmeier and Nannicini (2013) and Kaul et al. (2018).

The reform year is chosen as the starting year of the largest 5-year change in the aggregate reform index. This is 1983 for Chile, 1990 for Colombia, and 1986 for Mexico.[7] The control unit is chosen from a global pool of countries, but countries with substantial reforms on their own are excluded from the pool. In particular, those that had an increase in the reform index of more than 0.05 during the 5-year reform periods of the treated unit are excluded.

Of the three countries, growth acceleration relative to the synthetic control unit was recognizable only for Chile (Figures 23, 24, and 25), where 10 years after the reform real GDP per capita was higher than the synthetic control unit by 18.4 percent (Figure 23). In contrast, growth performance for Colombia and Mexico were disappointing, as their real GDP capita was lower than the control units by 11.5 percent and 14.5 percent, respectively.

---

[6] We use synth and synth_runner programs in STATA for our estimation.

[7] Reassuringly, the identified reform years are consistent with historical narratives documented in the literature. For example, in 1983 Chile embarked on a reform program after a major economic crisis. A wide spectrum of structural reforms took place, including privatization and reduction in import tariffs (Ffrench-Davis 2002, Laban and Larrain 1995). In Colombia, a series of new laws since 1990 drastically modified the regimes related to trade, foreign exchange, foreign investment, social security, and health (Cardenas and Gutierrez, 1996). Mexico acceded to GATT in 1985 and transformed itself from a closed economy into an open economy, while starting deregulations in a wide range of industries in 1989 (Tornell 1995, Fernandez 1995).

Placebo analysis shows that effect of the structural reforms are statistically significant for Chile, but not for Colombia and Mexico.

Figure 23. Chile: Synthetic Control and Placebo

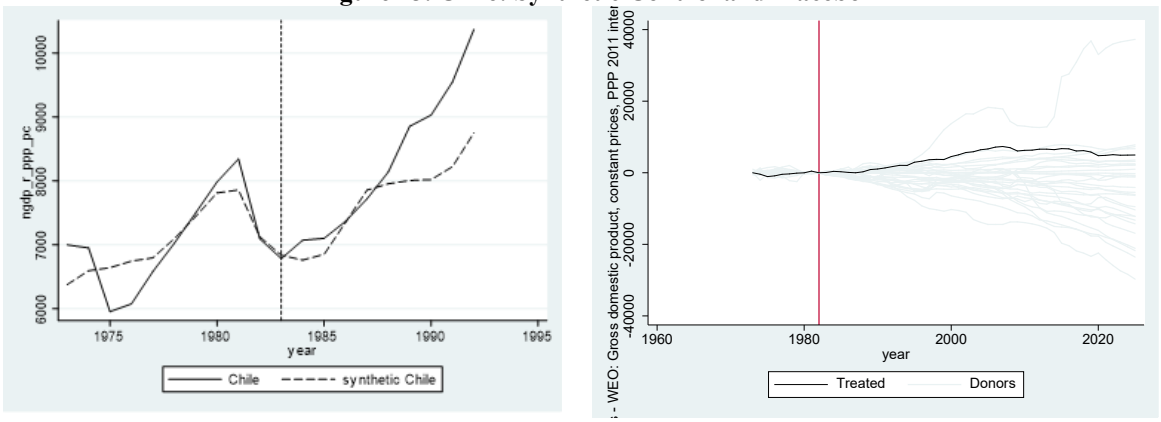


Figure 24. Colombia: Synthetic Control and Placebo

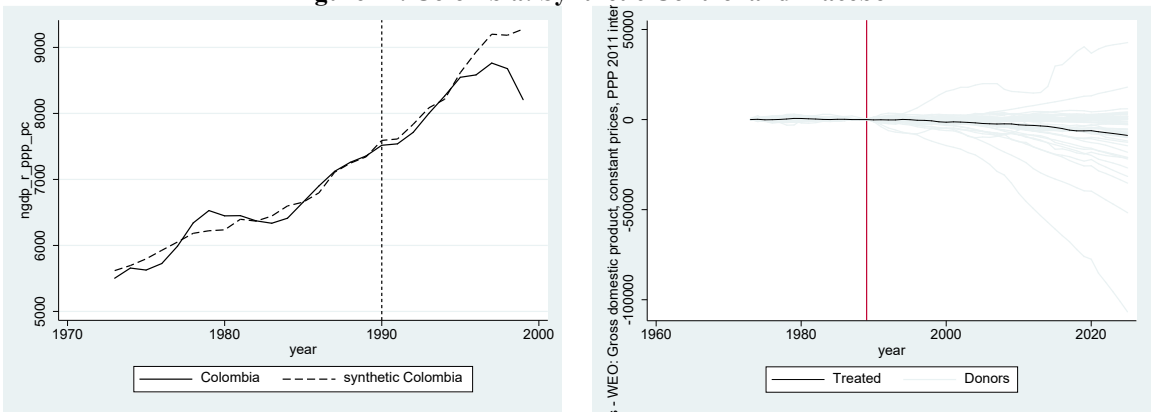
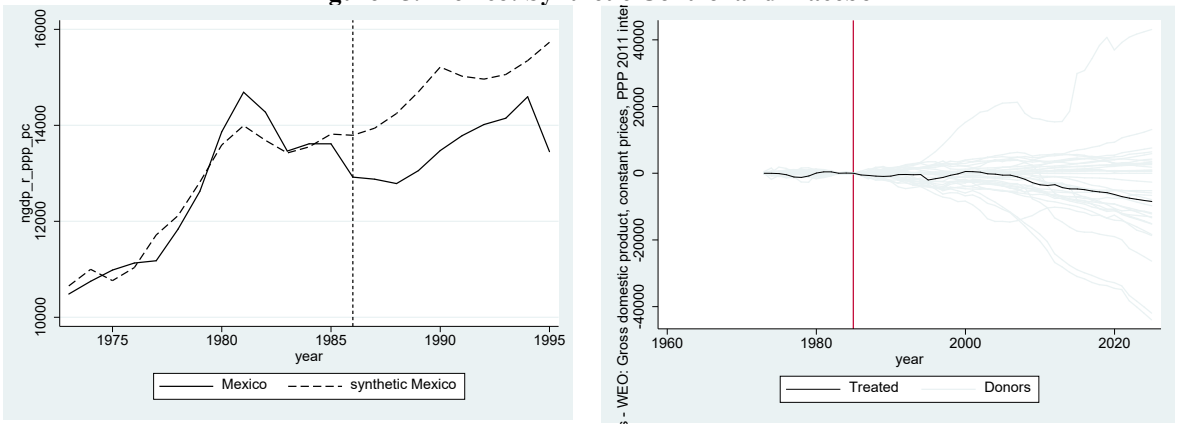


Figure 25. Mexico: Synthetic Control and Placebo



The heterogeneous results highlight the influence of the degree of advancement of structural reforms as well as factors other than the ones considered in this paper. For example, Bergoeing et al. (2001) compare the economic performance of Mexico and Chile in the 1980s and 1990s and conclude that the earlier advancement of structural reforms in privatization, banking, and bankruptcy laws in Chile can account for the better economic performance in that country. Separately, Levy (2018) argues that despite trade liberalization, macroeconomic stability, investment in human and physical capital, and efforts to increase efficiency including privatization, continued resource misallocation has hindered growth acceleration in Mexico.

Colombia's growth was relatively robust in the first half of the 1990s. However, fiscal and external imbalances accumulated as the current account deficit related to both public and private sector demand was increasingly financed by capital inflows. These macroeconomic imbalances, combined with a deterioration in the terms of trade and the turbulence in the international financial markets related to the Asian financial crisis, led to a rapid deterioration in growth in the late 1990s and financial crises in 1994 and 1999, respectively (IMF, 1999; IMF, 2001; Ocampo, 2013).

V. Policy Implications and Conclusions

Throughout this paper we have provided evidence suggesting that structural reforms have had broadly positive macroeconomic effects on a number of dimensions in LAC countries. Nevertheless, reforms in some areas remain highly controversial in the region. Despite the potentially positive effects of trade, product and financial market reforms documented in this paper, there is still significant resistance from the public in the region towards reform efforts in these areas, in particular as far as trade liberalization is concerned. This could be explained by a number of factors that have been considered in the political economy literature.

Resistance to reform could arise from economic losses associated with them being concentrated in certain (vocal) groups, while gains from reforms are diffuse across many individuals. Uncertainty over who will gain or lose from reforms is another source of resistance, creating a bias towards the status quo (Fernandez and Rodrik, 1991). Such uncertainty could increase with the complexity of reforms. Moreover, following the "war of attrition" argument put forward by Alesina and Drazen (1991), if reforms have significant distributional implications, different groups will attempt to shift the burden onto other groups, thus delaying the process. Reform will only occur when one group concedes and is forced to bear a disproportionate share of the burden.

Another potential obstacle to reforms could stem from concerns about their effects on electoral outcomes and the political costs associated with reform efforts. Alesina et al. (2020) find that "timing" matters in this regard. If reforms are implemented earlier in the political cycle, they are less likely to entail electoral costs. In fact, empirically, reforms only are

associated with electoral costs if they are implemented the year before the election. Moreover, overall economic conditions also matter. Reforms implemented in periods of strong economic activity typically are not penalized by the electorate.

The paper also discussed evidence that the effects of reforms are not uniform across different segments of the population. In that context, the adoption of policies to mitigate adverse effects on reforms is crucial and will help to foster the sustainability of reforms. For example, when discussing reforms to liberalize labor markets, Duval and Loungani (2019) highlight the importance of strengthening unemployment insurance and other social benefits at the same time to guarantee adequate protection of workers. Moreover, the tax system could also be used to redistribute some of the gains from reform. In most countries in LAC there is scope to increase the role of progressive (non-linear) personal income taxes in the tax structure, while enhancing redistributive policies on the expenditure side.

References

Abadie, A. and Gardeazabal, J. 2003. "The Economic Costs of Conflict: A Case Study of the Basque Country." *The American Economic Review* 93: 113-132.

Alesina, A., Furceri, D., Ostry, J., Papageorgiou, C. and Quinn, D., 2020. "Structural Reforms and Electoral Outcomes: Evidence from a World-Wide Dataset" NBER Working Paper 26720, Cambridge, MA.

Alesina, A., and Drazen, A., 1991. "Why are Stabilizations Delayed?" *The American Economic Review*, 81: 1170-1188.

Bakker, B., Ghazanchyan, M., Ho, A., Nanda, V. , 2020. " The Lack of Convergence of Latin-America Compared with CESEE: Is Low Investment to Blame?" IMF Working Paper 20/98. International Monetary Fund, Washington, DC.

Bergoeing, R., P. Kehoe, T. Kehoe, and R. Soto, 2001. "A Decade Lost and Found: Mexico and Chile in the 1980s," NBER Working Paper No. 8520.

Biljanovska, N. and Sandri, D., 2018. "Structural Reform Priorities for Brazil" IMF Working Paper 18/224. International Monetary Fund, Washington, DC.

Billmeier, A. and Nannicini, T., 2013."Assessing Economic Liberalization Episodes: A Synthetic Control Approach", *Review of Economics and Statistics* 95: 983-1001.

Ciminelli, G., Furceri, D., Ge, J., Ostry, J. D., and Papageorgiou, C., 2019. "The Political Costs of Reforms: Fear or Reality" IMF Staff Discussion Note 19/08. International Monetary Fund, Washington, DC.

Cardenas, M., and Gutierrez, C., 1996. "Efficiency and Equity Effects of Structural Reform" Fundacion para la Education Superior y el Desarrollo.

Da Silva, A., Givone, A., and Sondermann, D., 2017. "When Do Countries Implement Structural Reforms" ECB Working Paper No. 2078, European Central Bank.

David, A. C., Roldos, J. and Pienknagura, S., 2020. "Labor Market Dynamics, Informality, and Regulations in Latin America" IMF Working Paper 19/230, Washington: DC, January.

Duval, R. and Loungani, P., 2019. "Designing Labor Market Institutions in Emerging and Frontier Economies: Evidence and IMF Advice" IMF Staff Discussion Note 19/04.

Duval, R., Furceri, D., and Miethe, J., 2020. "Robust political economy correlates of major product and labor market reforms in advanced economies: Evidence from BAMLE for Logit Models" *Journal of Applied Econometrics,* https://doi.org/10.1002/jae.2791.

Feenstra, R. C., Inklaar, R. and Timmer, M. P., 2015. "The Next Generation of the Penn World Table." American Economic Review 105: 3150-3182.

Fernandez, A. 1995, "Deregulation as a Source of Growth in Mexico", NBER, in Reform, Recovery, and Growth: Latin America and the Middle East, Dornbusch, R., and Edwards, S., eds., (National Bureau of Economic Research)

Fernandez, R. and Rodrik, D., 1991. "Resistance to Reform: Status Quo Bias in the Presence of Individual-Specific Uncertainty" *The American Economic Review*, 81: 1146-1155.

Ffrench-Davis, R., 2002. "Economic Reforms in Chile: From Dictatorship to Democracy" University of Michigan Press, Ann Arbor, MI

Furceri, D. and S. Rehman, 2020. "What's Opportunity Got to Do with It?", mimeo.

IMF, 1999 "Colombia: Selected Issues and Statistical Appendix" IMF Staff Country Report No.99/6 International Monetary Fund, Washington, DC.

IMF, 2001 "Colombia: Selected Issues and Statistical Appendix" IMF Staff Country Report No.01/68 International Monetary Fund, Washington, DC.

IMF, 2019 "Reigniting Growth in Emerging Market and Low-Income Economies: What Role for Structural Reforms?" Chapter 3 of the October 2019 World Economic Outlook. International Monetary Fund, Washington, DC.

Jordà, Ò. and A. Taylor. 2016. "The Time for Austerity: Estimating the Average Treatment Effect of Fiscal Policy," *Economic Journal* 126: 219–55.

Kaul, A. Klobner, S., Pfeifer, G. and Schieler, M., 2018 "Synthetic Control Methods: Never Use All Pre-Intervention Outcomes as Economic Predictors", University of Hohenheim, mimeo.

Laban, R. and F. Larrain, 1995, "Continuity, Change, and the Political Economy of Transition in Chile", NBER, in Reform, Recovery, and Growth: Latin America and the Middle East, Dornbusch, R., and Edwards, S., eds., (National Bureau of Economic Research)

Levy, S., 2018 "Under-Rewarded Efforts: The Elusive Quest for Prosperity in Mexico" (Washington: Inter-American Development Bank)

Lora, E., 2012. "Las Reformas Estructurales en America Latina: Que se ha Reformado y Como Medirlo (Version Actualizada)," IDB Working Paper No. 346.

Prati, A., Onorato, M., and Papageorgiou, C., 2013. "Which Reforms Work and Under What Institutional Environment? Evidence from a New Data Set on Structural Reforms." *Review of Economics and Statistics* 95: 946-968.

Ocampo, J. A., 2013 "Performance and Challenges of the Colombian Economy" Initiative for Policy Dialogue Network Paper

Tornell, A., 1995, "Are Economic Crises Necessary for Trade Liberalization and Fiscal Reform? The Mexican Experience", NBER, in Reform, Recovery, and Growth: Latin America and the Middle East, Dornbusch, R., and Edwards, S., eds., (National Bureau of Economic Research)

Zettelmeyer, J., 2006. "Growth and Reforms in Latin America: A Survey of Facts and Arguments," IMF Working Paper 06/210. International Monetary Fund, Washington, DC.

VI. ANNEX A: DEFINITIONS AND SOURCES FOR SELECTED VARIABLES

Variable	Definition	Source
Structural Reforms Index	See main text.	Alesina et al. (2020) and authors' calculations.
Real GDP	Log of real GDP (in billions of local currency units).	World Economic Outlook database
Employment	Log of employment (in thousands of people)	World Economic Outlook database
Total Factor Productivity	TFP at constant national prices (2011=1)	Feenstra et al. (2015).
Real Investment	Log of real gross capital formation (in billions of local currency units).	World Economic Outlook database
Foreign Direct Investment	FDI inflows, percent of GDP in U.S. dollars.	IMF, Financial Flows Analytics Database
Informality Rate	Share of active workers contributing to social security.	IDB's Social Security Information System (SIMS) database.
Business Confidence	Log of index number. 100+ = optimistic.	Haver Analytics
Poverty Rate	Poverty headcount ratio at $3.20 a day (2011 PPP).	World Development Indicators
Inequality Index	Gini index (World Bank estimate)	World Development Indicators
Crises dates	Dummy variable for year of a banking, currency, or debt crisis.	Laeven and Valencia (2020)
Real exports	Exports of Goods and Services, in 2010 US$.	World Development Indicators
Real imports	Imports of Goods and Services, in 2010 US$.	World Development Indicators
Export concentration	Theil entropy index	Authors' calculations based on the Standard International Trade Classification (SITC), Revision 2.
Real sectoral value added	Sectoral value added, constant 2010 US$.	World Development Indicators

ANNEX B: ADDITIONAL REGRESSIONS ON DETERMINANTS OF REFORMS

Fixed-effects Logit Regressions for Determinants of Reforms
Average Partial Effects

	(1) Total Reforms All	(2) Total Reforms LAC	(3) Domestic Finance LAC	(4) Product Market LAC	(5) Trade LAC	(6) Labor All
Lagged level of index	0.078***	0.125*	0.08	0.248***	0.201*	0.068*
$(\text{GDP growth})_{t-1}$	0.001	-0.001	0.005	0.003	-0.001	0.001
Terms of Trade Change	0.008	0.006	-0.006	0.002	-0.013	-0.001
$(\text{Terms of Trade Change})_{t-1}$	-0.006	-0.019	-0.013	-0.004	0.001	-0.001
IMF program dummy	0.048	0.131*	0.130**	-0.039	0.099*	0.016
Recession dummy	-0.021	-0.006	0.038	-0.018	0.018	-0.006
Crises dummy	-0.03	-0.034	-0.098	0.045	-0.006	-0.011
Observations	2254	337	480	352	229	870
R-squared	0.163	0.175	0.178	0.247	0.184	0.083
Number of countries	86	15	16	16	16	40

*** p<0.01, ** p<0.05, * p<0.1. Dependent variable equals to 1 if change in reform index is larger than one standard deviation. Zero otherwise.