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Labor and Product Market Reforms and External Imbalances: Evidence from Advanced Economies

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Abstract

We explore the impact of major labor and product market reforms on current account dynamics using a new "narrative" database of major changes in employment protection for regular workers and product market regulation for non-manufacturing industries covering 26 advanced economies over the past four decades. Our main finding is that product market deregulation is associated with a weakening of the current account, while labor market deregulation is associated with an improvement. These effects are transitory and driven by both saving and investment responses. Labor and product market reforms both have a more positive impact on the current account balance when implemented under weak macroeconomic conditions. Our results are broadly consistent with predictions from recent DSGE models with endogenous producer entry and labor market frictions.

JEL Classification Numbers: C33; E62; H63; J08; O43

Keywords: current account; external imbalances; structural reforms; product market; labor market.

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I. INTRODUCTION

Global current account imbalances, as measured by the absolute sum of individual country surpluses and deficits, have declined from their pre-2008-financial-crisis peak level of 6 percent of global GDP to about at 3 percent of global GDP, but they remain sizable and, for over a third of them, deemed "undesirable" by the International Monetary Fund (IMF, 2019). Perhaps more strikingly, imbalances have rotated toward advanced economies and shown strong persistence, leading to continued divergence in net foreign asset positions. Countries such as Germany, Japan, Korea or the Netherlands have been running regular surpluses; others such as the Australia, Canada, the United Kingdom or the United States have had persistent deficits; and yet others such as Southern European economies have shifted from deficit to surplus status alongside large output losses after the crisis, raising questions regarding the sustainability of their surpluses (Kang and Shambaugh, 2016).

The persistence of individual current account imbalances among advanced economies hints at the influence of structural forces. While the list of these forces is long, ranging from demographic trends to persistent cross-country differences in fiscal policies, one that has surfaced more recently in global policy debates (e.g. IMF, 2018, 2019), yet has been marginally studied empirically, is market regulation.[1] In particular, labor and product market regulations vary widely across OECD countries (OECD, 2019), but their effects on current accounts, if any, are not clearly established.

This paper contributes to fill this gap. Building on a new "narrative" database of major reforms of employment protection legislation (EPL) for regular workers and product market regulation (PMR) for non-manufacturing industries for 26 advanced economies over the past four decades, we estimate the dynamic short to medium-term response of current account balances—and aggregate saving and investment rates, to shed light on transmission channels—to each type of reform. To this end, we rely on the local projection method (Jordà, 2005), which has been used to study the dynamic impact of macroeconomic shocks such as financial crises (Romer and Romer, 2017) or fiscal shocks (Jordà and Taylor, 2016); here, we use this approach to estimate the response to major changes in EPL and PMR instead of financial crises or fiscal shocks. Because the short-term effects of these reforms on output may differ between expansions and recessions (Cacciatore et al., 2016; Duval and Furceri, 2018), we also explore the role of business conditions in shaping the response of current account balances to reforms, using the smooth transition function proposed by Auerbach and Gorodnichenko (2012) to estimate fiscal multipliers in expansions and recessions.

The main finding is that product market deregulation tends to weaken the current account, while labor market deregulation strengthens it. These impacts are statistically and economically significant; on average, major historical episodes of EPL deregulation improved the current account balance by about 0.5 percentage point of GDP after two years, while major

[1] The IMF has regularly highlighted that market reforms—of varying nature across different countries, depending on their current account balance and the stance of their market regulations, in particular—could help reduce excess global imbalances. For example, IMF (2019) notes that investment-enhancing product market reforms could contribute to bring Germany's external position down to the "level implied by medium-term fundamentals and desirable policies".

cuts in non-manufacturing PMR weakened the balance by about 0.7 percentage point of GDP at the same horizon. While, partly for identification purposes, we focus on the short-term impact of reforms, there is evidence that this impact is mostly transitory and starts declining after a few years.

Endogeneity is a potentially significant concern in our framework since the reforms we identify are not necessarily exogenous events. We try to address this issue by controlling for expected economic growth at the time of reform, and other possible short-term drivers of current account balances including structural reforms in other areas. In order to further mitigate potential endogeneity concerns, we also re-estimate our specifications using an Instrumental Variable (IV) approach, drawing instruments from the political economy literature on the drivers of reforms, and again find our main results to be robust.

Our empirical analysis also sheds some light on the underlying channels. Specifically, we find that both saving and investment contribute to the overall response of the current account to labor and product market reforms. EPL deregulation raises aggregate saving (as share of GDP) and lowers aggregate investment (as share of GDP), while major cuts in PMR increase investment and, to a minor extent, saving. Finally, when reforms are carried out under weak macroeconomic conditions, the response of saving is typically more positive (or less negative), while that of investment is typically less positive (or more negative); as a result, the impact of labor market deregulation on the current account balance in bad times tends to be more positive, while that of product market deregulation tends to be less negative.

Our findings are broadly consistent with the predictions from recent dynamic stochastic general equilibrium (DSGE) models with endogenous producer entry and labor market frictions (Cacciatore and Fiori, 2016; Cacciatore et al., 2016a,b). In this class of models, creating new jobs takes time due to matching frictions, while destroying existing ones is a more immediate process. As a result, deregulation leads to lower employment, consumption and output in the short-term, and the current account strengthens—even more so during a recession, in line with our results, as the response of job destruction to deregulation is then stronger while that of job creation is weaker (Cacciatore et al., 2016a). If EPL deregulation also weakens the bargaining position of workers, wages fall (for supportive empirical evidence, see Ciminelli, Duval and Furceri, 2020) and external price competitiveness improves further, while firms face greater incentives to substitute labor for capital; both effects further improve the current account balance. By contrast, cutting barriers to entry in product markets increases aggregate investment as new firms enter, while its impact on aggregate saving is less clear-cut; overall, the positive impact of deregulation on investment typically dominates and the current account balance weakens (see e,g, Cacciatore et al., 2016b). This investment effect is muted if the reform is implemented in a recession that lowers the expected returns from market entry and tightens the external borrowing constraint on new firms (Cacciatore et al., 2016a); this is again consistent with our finding that product market deregulation no longer weakens the current account if undertaken in poor macroeconomic conditions. Note that these theoretical models also predict that the impact of market reforms on current account balances is ultimately transitory, also broadly in line with our empirical findings.

This paper relates to two large strands of literature on the drivers of current account dynamics and the macroeconomic impact of market regulations, respectively. Many theoretical papers indirectly shed light on several potential channels through which structural reforms may affect aggregate saving, investment and the current account. First, reforms may be akin to a productivity shock, whose impact on the current account balance has been widely studied and depends on whether the productivity increase is permanent or temporary and occurs in the tradable or non-tradable sector (see e.g. Obstfeld and Rogoff, 1996); seen under this lens, the impact of a permanent increase in the productivity level of the non-tradable sector—resulting from product market deregulation in non-manufacturing industries, for example—is ambiguous and depends on the relative values of households' inter-temporal and intra-temporal rates of substitution (Fournier and Koske, 2010). A wide range of papers using DSGE models explore the dynamic effects of labor and product market reforms—typically modeled as wage and price markups declines, respectively (see the discussion in Section II below)—on various macroeconomic outcomes, including current accounts (see e.g. Everaert and Schule, 2008; Gomes et al., 2013; Kollmann et al., 2015). A few more recent studies explore more directly the effects of the specific market frictions covered in this paper, and show that modeling explicitly such frictions makes a difference to the predicted impact of reform (Cacciatore and Fiori, 2016; Cacciatore et al., 2016a,b). For example, when factoring in the fact that product market deregulation lowers entry costs and thereby strengthens investment incentives, its predicted impact on the current account balance is unambiguously more negative than if it were merely considered as a negative markup shock or a positive productivity shock.

The multiplicity of channels through which labor and product market reforms can affect saving, investment and current accounts means that sorting out their aggregate impact is primarily an empirical issue. Existing papers have explored this impact directly through cross-country time-series panel regressions using various indicators of labor and product market regulations, with wide variation in the sign, statistical significance and magnitude of the impact of individual regulations. Kennedy and Sløk (2005) find a small positive impact of tight product market regulation on the current account balance; Bertola and Lo Prete (2015) find a negative impact of stringent labor market regulation in some cases, as do Zemanek et al. (2010) in the context of intra-euro area current account balances; Kerdrain, Koske and Wanner (2010) find supportive evidence for both effects; by contrast, Culiuc and Kyobe (2017) do not find any conclusive evidence. In addition, these studies typically do not analyze the short-term effects of deregulation, even though these effects are predicted to be mostly transitory. Our paper makes an improvement over previous studies through a novel identification of the precise timing and nature of *major* legislative actions (reform 'shocks') and focuses explicitly on the dynamic response of the current account balance in the aftermath of these 'shocks'.

The remainder of the paper is structured as follows. As background and motivation for our empirical analysis, Section 2 provides a brief overview of existing theoretical evidence regarding the effects of job protection and product market deregulation on the current account. Sections 3 and 4 discuss our data on labor and product market reforms and the empirical strategy followed to study the dynamic response of current accounts to these reforms. Section 5 presents our baseline empirical results, extensions and robustness checks. Section 6 concludes.

II. THEORETICAL EVIDENCE: A BRIEF OVERVIEW

At the cost of simplification, two broad sets of theoretical models shed light on the dynamic effects of EPL and product market reforms on the current account balance.

The first set of models includes standard DSGE models with nominal wage and/or price rigidities, in which EPL and product market regulation are not modeled explicitly but are instead considered to be embedded implicitly in specific model parameters. These models typically feature monopolistically competitive product markets, with imperfect substitution between varieties capturing the extent of imperfect competition between firms. On the labor market side, EPL is implicitly captured either by the imperfect substitutability between different labor varieties in models with monopolistically competitive labor markets (e.g. Everaert and Schule, 2008; Gomes et al., 2013), or by the strength of workers' bargaining power in models with (Nash) bargaining between representative firms and workers (e.g. Kollmann et al., 2015). Both EPL and product market deregulation involves a reduction in wage and price markups stemming from an increase in the elasticity of substitution between different labor and product varieties, respectively—or from a reduction in workers' bargaining power, in the case of EPL reform under Nash bargaining. In this first class of models, a lower wage markup increases employment, capital and output in the long term. The associated permanent income effect increases the consumption of forward-looking households already in the short term, all else equal. However, if a fraction of households is credit-constrained, their consumption falls due to the short-term decline in wages and thereby in current income—partly offset by the positive impact of lower wages on firms' labor demand and employment; whether aggregate consumption rises, or instead declines, depends on the extent to which it is primarily driven by permanent, or instead current, income. Likewise, the response of aggregate investment to a lower wage markup is not clear-cut as it is the outcome of two offsetting forces: on the one hand, higher profitability stimulates investment, but on the other hand, lower wages induce firms to substitute labor for capital. Since effects on both aggregate consumption (and therefore saving) and investment are ambiguous *a priori*, so is the impact on the current account. In calibrated versions of these models, however, the current account typically strengthens (see e.g. Everaert and Schule, 2008; Kollmann et al., 2015). Consistent with this, the real effective exchange rate typically depreciates in the short term—either through lower wages and prices under a fixed exchange rate regime, or as a result of monetary policy easing and nominal exchange rate depreciation under a flexible regime. Over the longer term, as saving and investment adjust to their new steady-state paths, the current account gradually returns to its initial level and the reform does not affect steady-state saving and investment rates, resulting in a transitory effect on the current account.

The impact of a lower price markup on the current account is also ambiguous *a priori* in this first class of models, but typically negative in calibrated exercises. This is because, compared with a wage markup decline, a lower price markup has a larger positive impact on both consumption—as firms' demand for labor and capital increases and pushes up wages—and investment—as wages rise rather than fall, inducing firms to substitute capital for labor rather than the reverse. The short-term expansionary impact on the economy is associated with a real exchange rate appreciation and a weakening of the current account. Again, as all macroeconomic variables—capital, employment, consumption, investment—converge to their

new steady state, the current account balance gradually returns to its initial level, since steady-state saving and investment rates are typically unchanged.

The second class of DSGE models features EPL and product market regulation explicitly—in the form of worker layoff and firm entry costs, respectively—in the presence of labor market frictions and endogenous producer entry (Cacciatore and Fiori, 2016; Cacciatore et al., 2016a,b), building on key insights from the seminal paper of Blanchard and Giavazzi (2003). The explicit modeling of regulations yields more realistic insights regarding the short-term impact of deregulation—for example, cutting layoff costs has different effects from cutting unemployment benefits, while both reforms are captured indistinctively by a reduction in the wage markup in the first class of models above. As a result, this second class of models is more suitable for the analysis of the impact of market deregulation on current account dynamics.

The additional features of this second class of models—on top of those already present in the first class—strengthen the likelihood that EPL liberalization improves the current account while product market deregulation weakens it. As regards EPL, cutting layoff costs reduces the profitability of low-productivity job matches, leading to higher job destruction, but it also reduces the expected cost of terminating a job match in the future, leading to job creation. While creating new jobs take time due to matching frictions, destroying existing ones is a more immediate process. As a result, deregulation leads to lower employment, consumption and output in the short-term, strengthening the current account, all else equal. As regards product market deregulation, cutting barriers to entry leads new firms to pay the entry cost and build capital to start producing, all of which stimulates short-run investment more than if only an exogenous decline in price markups (through a higher elasticity of substitution between product varieties) were assumed. As a result, the current account balance is more likely to deteriorate, and typically does so in simulations of calibrated versions of these models.

This second class of models is also informative about the role of business conditions for the impact of market deregulation on current account dynamics, predicting it to be more positive (or less negative) in bad times. During a recession, EPL deregulation has a larger impact on job destruction and a smaller one on job creation, resulting in a larger short-term decline in consumption and output (for supportive empirical evidence, see Duval, Furceri and Jalles, 2020). As result, the current account balance is predicted to improve more than it would during an expansion. As regards product market deregulation, the net present value of market entry is lower in a recession, and insofar as the external borrowing constraint also tightens, the ability of firms to fund their entry costs by borrowing from abroad is reduced. As a result, the positive effect of deregulation on aggregate investment, and its negative impact on the current account balance, will be smaller than during an expansion (Cacciatore et al., 2016a).[2]

[2] There is a debate as to whether, and if so how, deregulating in a recession weakens the short-term consumption and investment impact of reform, and thereby improves the current account, more when monetary policy is constrained by a binding zero (or any effective) lower bound on interest rates. Using a standard DSGE model of the first class described above, Eggertsson, Ferrero and Raffo (2014) find weaker that market reforms can be counter-productive when the zero lower bound is binding, because lower inflation following deregulation pushes up the real interest rate, weakening aggregate demand. Using a DSGE model of the second class, Cacciatore et al. (2020) reach a different conclusion, finding very small (and if anything, slightly positive) demand effects of

(continued…)

Overall, existing theory—particularly the class of DSGE models with endogenous producer entry and labor market frictions that feature explicit worker layoff and firm entry costs—tends to deliver three consistent predictions. First, EPL deregulation tends to strengthen the current account, while product market deregulation weakens it. Second, the impact of market deregulation on the current account is more positive (or less negative) in bad times. Third, all of these effects are typically transitory; in the long run, the current account balance is generally expected to return to its pre-reform level, as neither aggregate saving nor investment rates are permanently affected. At the same time, some of these predictions are not unambiguous theoretically, and tend to show up more clearly only once calibrated models are simulated. And in any event, no single theoretical model captures all the relevant macroeconomic effects of labor and product market reforms. For example, labor market deregulation may increase the degree of uninsurable risk faced by households, leading them to increase their precautionary saving and thereby the likelihood that deregulation strengthens the current account balance (Carroll and Jeanne, 2009);[3] this channel is ignored in the classes of models discussed above. Therefore, the impact of EPL and product market reforms on current account balances is ultimately an empirical matter.

III. REFORM DATA

Our analysis focuses on major policy changes in product market regulation and employment protection legislation for regular workers. These are the key reforms that have been routinely advocated by think tanks and international organizations such as the IMF and the OECD (see for example IMF, 2016).

Major reforms of product market regulation and regular employment protection legislation are identified by Duval et al. (2018), who examine documented legislative and regulatory actions reported in all available *OECD Economic Surveys* for 26 individual advanced economies since 1970, as well as additional country-specific sources.[4] In this respect, the methodology is related to the "narrative approach" used by Romer and Romer (1989, 2004, 2010) and Devries et al.(2011) to identify monetary and fiscal shocks and periods of high financial distress. The approach also considers both reforms and "counter-reforms," namely policy changes in the opposite direction. Therefore, for each country, our reform variable in each area takes value 0 in non-reform years, 1 in reform years, and -1 in counter-reform years.

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the zero lower bound itself, relative to a market reform scenario in a regular recession where the zero lower bound is not binding. This is because, when explicitly modeled, market reforms are no longer necessarily deflationary—for example, product market deregulation triggers entry of new firms that invest and recruit, which is an inflationary force that offsets the deflationary impact of lower markups.

[3] There is ample evidence at the micro level that higher income uncertainty is associated with larger wealth holdings by households (or higher saving/lower consumption). Income risk is typically measured by either the variance of income over time (e.g. Guariglia and Rossi, 2002; Zhou, 2003; Hurst et al., 2005; Bartzsch, 2006) or by self-reported information on the future employment and/or earnings outlook (e.g. Lusardi, 1997; Harris et al., 2002; Carroll et al., 2003; Benito, 2006).

[4] The 26 countries covered are Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Slovak Republic, Spain, Sweden, Switzerland, United Kingdom and United States.

In a first step, Duval et al. (2018) identify all legislative and regulatory actions related to product market regulation, employment protection legislation and unemployment benefits mentioned in any *OECD Economic Survey* for any of the 26 countries over the entire sample. Over 1000 such actions are identified overall. In a second step, for any of these actions to qualify as a major reform or "counter-reform"—namely a major policy change in the opposite direction—one of the following three alternative criteria has to be met: (1) the *OECD Economic Survey* uses strong normative language to define the action, suggestive of an important measure (for example, "major reform"); (2) the policy action is mentioned repeatedly across different editions of the *OECD Economic Survey* for the country considered, and/or in the retrospective summaries of key past reforms that are featured in some editions, which is also indicative of a major action; or (3) the existing OECD indicator of the regulatory stance in the area considered displays a very large change (in the 5th percentile of the distribution of the change in the indicator). The OECD indicators used for this purpose are the seven indicators of product market regulation in seven key non-manufacturing industries (telecoms, electricity, gas, post, rail, air passenger transport, and road freight),[5] and the employment protection legislation index for regular workers. When only the third condition is met, an extensive search through other available domestic and national sources, including through the internet, is performed to identify the precise policy action underpinning the change in the indicator. In principle, reforms may be followed by counter-reforms (reform reversals), and *vice versa*. In practice, however, reform reversals are rare events in our sample, and the results we present below are robust to controlling for future shocks, be they positive (reforms, taking value 1) or negative (counter-reforms, taking value -1).

More broadly, in a context where our goal is to identify and trace out economies' current account responses to major reform shocks, this approach has several strengths compared to indirect methods used in other papers that rely exclusively on changes in OECD policy indicators. Specifically, the reform database: identifies the precise nature and exact timing of major legislative and regulatory actions in key labor and product market policy areas; identifies the precise reforms that underpin what otherwise looks like a gradual decline in OECD policy indicators without any obvious or noticeable break (for example, the series of reforms that took place in the telecommunications industry in many countries in the mid-late 1990s); captures reforms in areas for which OECD indicators exist but do not cover all relevant policy dimensions; covers a longer time period in some policy areas, such as regarding employment protection legislation; documents and describes the precise legislative and regulatory actions that underpin observed large changes in OECD indicators.

Finally, compared with other existing databases on policy actions in the area of labor market institutions, such as the European Commission's *Labref*, the Fondazione Rodolfo de Benedetti-IZA database, and the ILO's *EPLex* database, the approach taken by Duval et al. (2018) allows identifying a rather limited set of major legislative and regulatory reforms, as opposed to just a long list of actions that in some cases would be expected to have little or no

[5] The focus is on product market reforms in the non-manufacturing sector because the bulk of market regulations (including barriers to entry and public monopolies, for example) and their reforms are largely concentrated in that broad sector, rather than in manufacturing, over this sample of countries and time period.

bearing on macroeconomic outcomes. This is particularly useful for empirical analysis that seeks to identify, and then estimate, the dynamic effects of reform shocks.

The strengths of this narrative reform database come with one limitation; because two large reforms in a given area (for example, employment protection legislation) can involve different specific actions (for example, a major simplification of the procedures for individual and collective dismissals, respectively), only the average impact across major historical reforms can be estimated. It should also be highlighted that the reform database provides no information regarding the *stance* of current (or past) product and labor market regulations, which is not the purpose of this paper.

Tables 1-3 present stylized facts on reforms—that is, decreases in regulation.[6] Figure 1 provides the number of reforms identified in the sample and illustrates the heterogeneity of reforms efforts across regulatory areas. Product market reforms have been more frequently implemented, in particular in telecommunications and air transport. In general, fewer major reforms have been implemented in the areas of employment protection legislation for regular workers—about 35.

The vast majority of product and labor market reforms in our sample were implemented during the 1990s and the 2000s (Table 1). Exceptions are reforms in the area of rail transport, which were also undertaken in the 1980s. In terms of geographical distribution, EU countries took more actions than non-EU countries on average, reflecting the greater scope for action in the former group. For example, the frequency of major reforms of employment protection legislation in Southern European countries—that is, Greece, Italy, Portugal and Spain—stands out (Table 2). Finally, while product market reforms have been more frequently implemented during periods of higher economic growth—that is when the real GDP growth in each country was above its historical average—the implementation of labor market reforms has not depended significantly on prevailing economic conditions (Table 3).

Descriptive statistics on the current account-GDP ratio before and after the beginning of these reform episodes suggest that EPL reforms have on average been associated with an increase in current account, while the opposite holds true for product market reforms (Figure 2). The next section checks whether this suggestive evidence holds up to more formal tests.

[6] We do not present stylized facts on counter-reforms—that is, increases in regulation—as these are typically rare events in our sample, with the exception for employment protection legislation. In particular, the number of counter reforms are: i) 0 for telecommunications, postal services, electricity, gas and road transport; 3 for airline transport; 1 for road transport, 20 for employment protection legislation; and 9 for unemployment benefits.

Figure 1. Number of reforms shocks (26 advanced economies, 1970-2013)

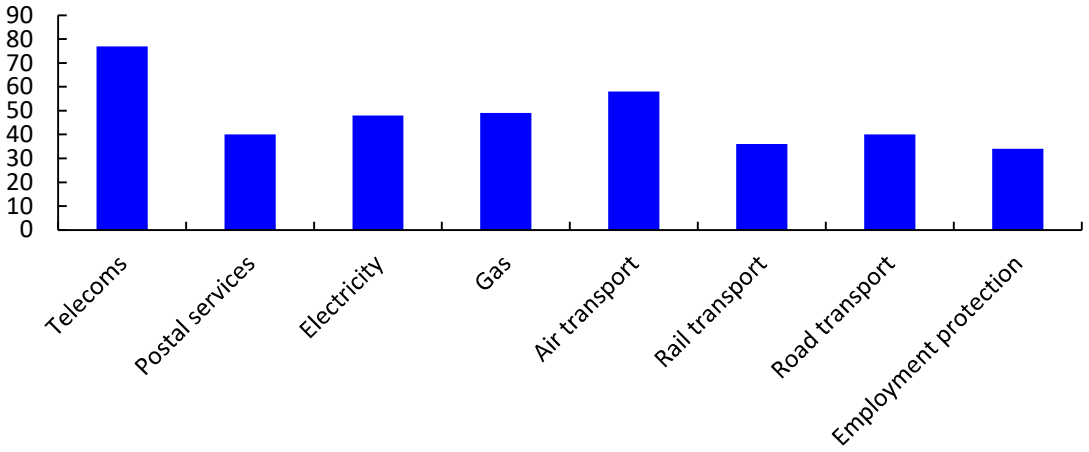
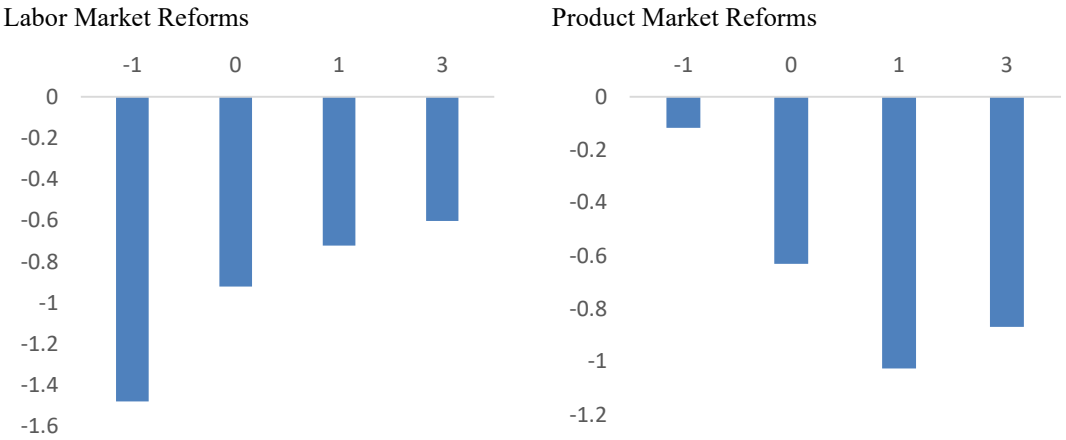


Figure 2. Evolution of the Current Account around Labor and Product Market Reforms (% of GDP)



Note: x-axis in years; t=0 is the year of the shock.

Table 1. Reform shocks by period (%)

	1970s	1980s	1990s	2000-2014
Telecoms	0	9.1	53.2	28.1
Postal services	0	5.0	40.0	55.0
Electricity	0	2.1	41.7	56.2
Gas	0	22.0	23.7	54.3
Air transport	1.7	13.8	51.7	32.8
Rail transport	0	45.0	35.0	20.0
Road Transport	0	18	12	10
Employment protection legislation	8.6	11.4	31.4	48.6

Table 2. Reform shocks by geographical region (%)

	Non-EU	Southern EU	Northern EU	Other EU
Number of countries	6	4	7	7
Telecoms	24.3	18.6	30.0	27.1
Postal services	15.0	12.5	25.0	47.5
Electricity	20.8	18.8	27.1	33.3
Gas	10.2	16.9	20.3	52.5
Air transport	24.1	13.8	19.0	43.1
Rail transport	22.2	16.7	25.0	36.1
Road Transport	20.0	15.0	35.0	30.0
Employment protection legislation	11.4	45.7	11.4	31.4

Note: Non-EU=Australia; Canada; Japan; Korea, New Zealand and the United States. Southern EU= Greece, Italy, Portugal and Spain; Northern EU= Denmark; Finland; Iceland; Ireland; Norway, Sweden and the United Kingdom. Other EU= Austria, Belgium, Czech Republic; France; Germany; Luxembourg; Slovak Republic.

Table 3. Reform shocks over the business cycle (%)

	Lower economic growth	Higher economic growth
Telecoms	35.1	64.9
Postal services	50.0	50.0
Electricity	27.1	72.9
Gas	38.8	61.2
Air transport	50.0	50.0
Rail transport	30.6	69.4
Road Transport	37.5	62.5
Employment protection legislation	48.6	51.4

Note: lower (higher) economic growth = real GDP growth below (above) the reforming country's historical average.

IV. EMPIRICAL METHODOLOGY

In order to estimate the dynamic response of the current account balance, saving and investment—all expressed as shares of GDP—to reforms, we follow the local projection method proposed by Jordà (2005) to estimate impulse-response functions. This approach has been advocated by Auerbach and Gorodnichenko (2013) and Romer and Romer (2015), among others, as a flexible alternative to vector autoregression (autoregressive distributed lag) specifications since it does not impose dynamic restrictions. It is better suited to estimating nonlinearities in the dynamic response—such as, in our context, interactions between reform shocks and macroeconomic conditions. The baseline specification is:

$$y_{t+k,i} - y_{t-1,i} = \alpha_i + \gamma_t + \beta_k R_{i,t} + \theta X_{i,t} + \varepsilon_{i,t} \quad (1)$$

in which y is the variable of interest, namely the current account balance, saving or investment (as ratios to GDP); β_k denotes the (cumulative) response of the variable of interest in each k year after the reform; α_i are country fixed effects, included to take account of differences in countries' average current account balances—which typically differ at the start of their reform episodes; $R_{i,t}$ denotes the reform shock in the area considered;[7] and $X_{i,t}$ is a set a of control variables including three lags of reform shocks, as well as three lags of the dependent variable.

Equation (1) is estimated using OLS. Impulse response functions (IRFs) are then obtained by plotting the estimated β_k for k= 0,1,..3, with 90 (60) percent confidence bands computed using the standard deviations associated with the estimated coefficients β_k—based on robust standard errors clustered at the country level.[8] Since the current account balance is the difference of saving and investment, and since we use strictly identical econometric specifications for each of these three variables, the estimated responses to reform will be additive by property of OLS—that is, the response of the current account balance will be equal to the difference of responses of saving and investment.

A potential limitation of the methodological approach is that reforms are not exogenous shocks as they could be potentially anticipated, correlated with past changes in economic activity as well to other macroeconomic variables and reforms, and implemented because of concerns regarding future weak economic growth. We address these limitations in Section V.B on robustness checks, including the use of an Instrumental Variable (IV) approach drawing our instruments from the political economy literature on the drivers of reforms, and we show that our main results are robust and remain qualitatively unchanged.

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[7] All reform shocks featured in our database are country-wide shocks, except for product market reform shocks which are constructed at the country-sector level for seven different network industries. The latter are converted into country-wide product market reform shocks by summing the reform in each network sector.

[8] Another advantage of the local projection method compared to vector autoregression (autoregressive distributed lag) specifications is that the computation of confidence bands does not require Monte Carlo simulations or asymptotic approximations. One limitation, however, is that confidence bands at longer horizons tend to be wider than those estimated in vector autoregression specifications.

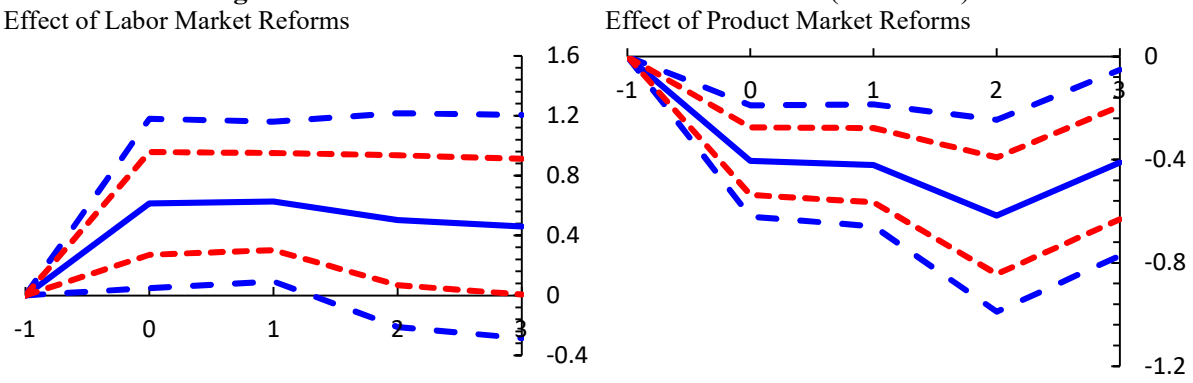
V. RESULTS

A. Baseline

Figure 3 shows the estimated dynamic response of the current account balance (as ratio to GDP) to employment protection legislation (EPL) and product market (PMR) reform shocks over the three-year horizon following the reform implementation, together with both the 90 percent and 68 percent confidence intervals around the point estimates. Results suggest that product market deregulation are associated with a weakening of the current account, while labor market deregulation with an improvement. The short-term effects are statistically and economically significant; on average, major historical episodes of EPL deregulation improved the current account balance by about 0.5 percentage point of GDP after two years, while major cuts in non-manufacturing PMR weakened the current account balance by about 0.7 percentage point of GDP at the same horizon. To give a sense on the order of the magnitude of the effects of EPL and PMR reforms on the current account, these effects are broadly similar to the effect of a 1 percentage point of GDP improvement in the fiscal balance found in the literature (e.g., Bluedorn and Leigh, 2011; Furceri and Zdzienicka, 2020).

The effects of reforms on the current account start declining after a few years and become statistically insignificant seven years after the reforms.[9] Overall, in terms of both sign and duration, our results are broadly consistent with theoretical predictions from recent DSGE models with endogenous producer entry and labor market frictions (Cacciatore and Fiori, 2016; Cacciatore et al., 2016a,b): job protection deregulation strengthens the current account while product market deregulation weakens it, and in both cases these effects, while persistent, are ultimately transitory.

Figure 3. Effect of Reforms on the Current Account (% of GDP)



Note: x-axis in years; t=0 is the year of the shock. Solid lines denote the response to a major historical reform, blue dashed lines denote 90 percent confidence bands and red dashed lines denote 68 percent confidence bands, based on standard errors clustered at country level.

[9] For EPL reform the 7-year (medium-term) current account effect is 0.49 percent of GDP with a t-statistics of 0.9; for PMR reform it is -0.38 percent of GDP with a t-statistics of 1.2. The temporary, rather than permanent (or at least highly persistent) current account impact of product market reforms is consistent with temporary, rather than permanent effects of such reforms on economic growth. For empirical evidence that such growth effects are indeed transitory, see e.g. Bouis, Duval and Eugster (2020), and Duval and Furceri (2018).

B. Sensitivity and Robustness checks

Several sensitivity exercises and robustness checks were conducted—see the Annex for detailed description and discussion. First, we re-estimated equation (1) including year fixed effects and country-specific time trends as additional control variables (Figures A1 and A2 in the Annex). Results are similar to, and not statistically different from, the baseline results. Given the possible concern that results may suffer from omitted variable bias - reforms may be carried out because of past economic conditions or at the same time of other macroeconomic policy actions affecting the current account - we expanded the set of controls to include other macroeconomic variables that have been typically found to affect the current account (see e.g. IMF, 2018, 2019). Results suggest that this source of omitted variable bias is likely to be negligible in practice (Figure A3 in the Annex). Since EPL and PMR reforms may be implemented as part of broader packages, we also re-estimated our main regression controlling for reforms in the following additional areas: labor tax wedge, unemployment benefits replacement rate, and EPL for temporary contracts (Figures A4 and A5 in the Annex). Such augmentation of the vector of controls does not change the basic thrust of our results. In addition, we controlled for GDP growth expectations and also inspected if reform reversals played a role. Results remained robust to the baseline ones reported earlier (Figure A6 in the Annex). We also checked if focusing solely on reforms (and omitting "counter-reforms") would change the results (Figure A7 in the Annex). Next, we re-estimated our main regression for reforms in the each of the following individual PMR areas: telecoms, postal services, electricity, gas, air transport, rail transport, and road transport (Figure A8 in the Annex). Finally, to mitigate endogeneity concerns, we re-estimated equation (1) with an Instrumental Variable (IV) approach, using as instruments political economy variables found in the literature to induce reforms (Duval, Furceri and Miethe, 2020). The IV results are similar to, and not statistically different from, those obtained using OLS, suggesting that endogeneity is not a serious concern in our case (Figure A9 in the Annex).

C. Saving and investment

To shed some light on the underlying channels through which structural reforms affect the current account, we re-estimate equation (1) for saving and investment, separately. Results suggest that both saving and investment contribute to the overall response of the current account to labor and product market reforms. After 3 years, EPL deregulation raises aggregate saving (as a share of GDP) and lowers aggregate investment (as a share of GDP)—even though these effects are not statistically different from zero—while major cuts in PMR statistically significantly increase investment and, to a lesser extent, saving (Figure 4). In particular, we find that major historical episodes of EPL deregulation are associated with an improvement in saving of about 0.3 percentage point of GDP and a decline in investment of about 0.2 percentage point of GDP three years after the reform. In contrast, major cuts in non-manufacturing PMR are associated with an improvement in investment and saving of about 1 and 0.4 percentage points of GDP after two years, respectively.[10]

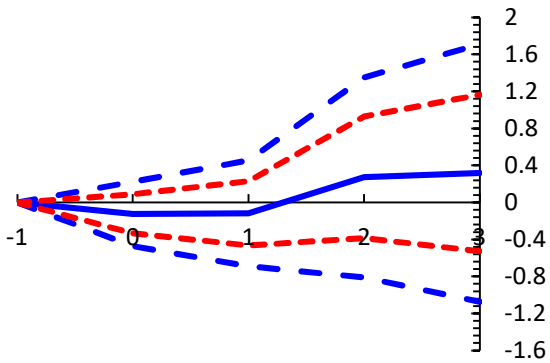
[10] An alternative way to disentangle the effect of reforms on the current account it to examine the response of exports and imports separately. The results presented in Figure A10 in the Annex show that while EPL reforms are associated with a significant increase in both exports and imports (with the effect on exports being larger than

(continued…)

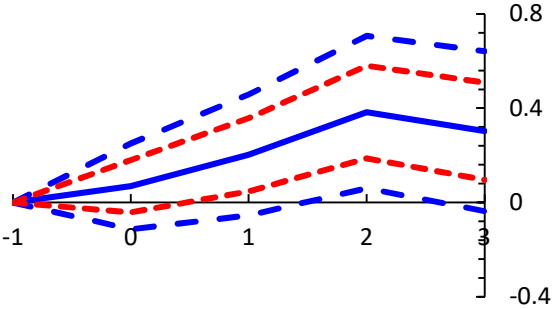
Figure 4. Effect of Reforms on Saving and Investment (% of GDP)

Saving (% of GDP)

Effect of Labor Market Reforms

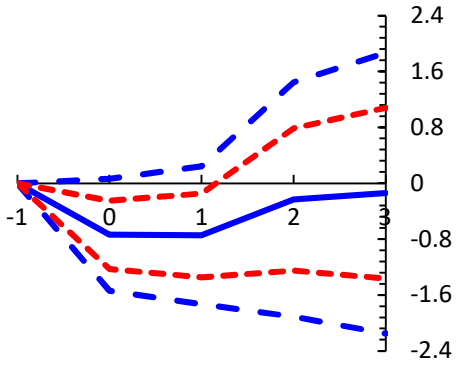


Effect of Product Market Reforms

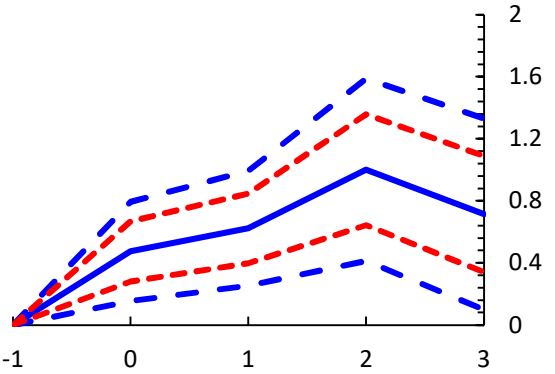


Investment (% of GDP)

Effect of Labor Market Reforms



Effect of Product Market Reforms



Note: x-axis in years; t=0 is the year of the shock. Solid lines denote the response to a major historical reform, blue dashed lines denote 90 percent confidence bands and red dashed lines denote 68 percent confidence bands, based on standard errors clustered at country level.

D. The Role of Business Cycle conditions

To explore the role of business cycle conditions for the effect of reforms on the current account (and its transmission channels), the dynamic response is now allowed to vary with the state of the economy, as follows:

$$y_{i,t+k} - y_{i,t-1} = \alpha_i + \beta_k^L F(z_{i,t}) R_{i,t} + \beta_k^H (1 - F(z_{i,t})) R_{i,t} + \theta M_{i,t} + \varepsilon_{i,t} \qquad (2)$$

with

$$F(z_{it}) = \frac{\exp(-\gamma z_{it})}{1+\exp(-\gamma z_{it})}, \quad \gamma > 0$$

in which z_{it} is an indicator of the state of the economy (the output gap[11]) normalized to have zero mean and unit variance. The weights assigned to each regime vary between 0 and 1 according to the weighting function $F(.)$, so that $F(z_{it})$ can be interpreted as the probability of being in a given state of the economy. The coefficients β_L^k and β_H^k capture the current account

that on imports), the effects of PMR reforms are smaller and less precisely estimated (in this case, with the effect on imports being larger than that on exports).

[11] The output gap, expressed in percentage of potential GDP, is retrieved from the *IMF World Economic Outlook.*

impact of reforms at each horizon k in cases of extreme recessions ($F(z_{it}) \approx 1$ when z goes to minus infinity) and booms ($1 - F(z_{it}) \approx 1$ when z goes to plus infinity), respectively.[12] We choose $\gamma = 1.5$, following Auerbach and Gorodnichenko (2012), so that the economy spends about 20 percent of the time in a recessionary regime—defined as $F(z_{it}) > 0.8$—close to the typical business cycle pattern of many advanced economies.[13]

As discussed in Auerbach and Gorodnichenko (2012, 2013), the local projection approach to estimating non-linear effects is equivalent to the smooth transition autoregressive (STAR) model developed by Granger and Teräsvirta (1993). The advantage of this approach is twofold. First, compared with a model in which each dependent variable would be interacted with a measure of the business cycle position, it permits a direct test of whether the effect of reform varies across different regimes such as recessions and expansions. Second, compared with estimating structural vector autoregressions for each regime, it allows the effect of reforms to change smoothly between recessions and expansions by considering a continuum of states to compute the impulse response functions, thus making the response more stable and precise.

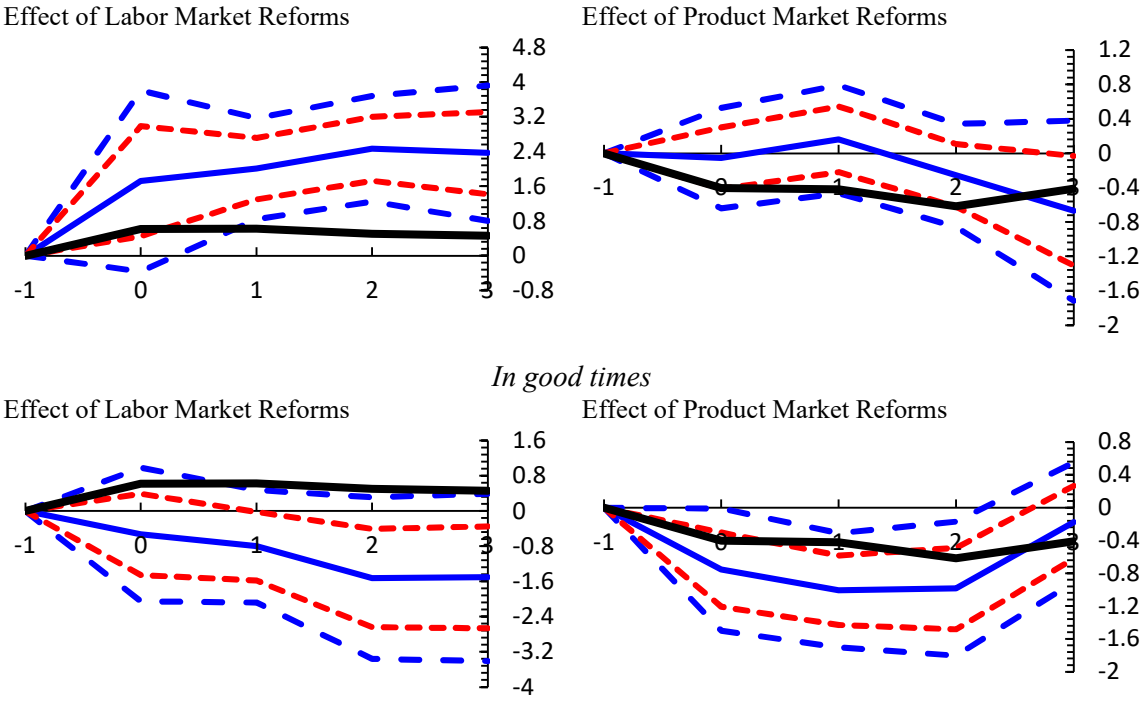
Results suggest that the response of the current account to EPL and PMR reforms varies significantly depending on prevailing business conditions (Figure 5). In recessions, reforms have a sizable positive and statistically significant impact on the current account balance, whereas they have a negative and statistically significant impact in a boom—the difference in the response across the two economic regimes is statistically significant as regards PMR reforms. The main reason is that reforms—especially of EPL—tend to have a larger positive effect on saving in bad times, as agents tend to borrow more for precautionary motives (Figure 6), and they have larger positive effect on investment during economic expansions (Figure 7).

These results are consistent with predictions from recent DSGE models with endogenous producer entry and labor market frictions. During a recession, EPL deregulation has a larger impact on job destruction and a smaller one on job creation, resulting in a larger short-term decline in consumption (increase in saving), and a larger positive effect on the current account. As regards product market deregulation, the net present value of market entry is lower in a recession, leading to a smaller positive effect on investment and weakening of the current account.

The results are also robust to re-estimating equation (2) without measuring business cycle conditions through a smooth transition function, but instead more simply through a dummy variable that takes value 1 when the GDP growth rate of the country considered is below its sample average and zero otherwise (Figure 8).

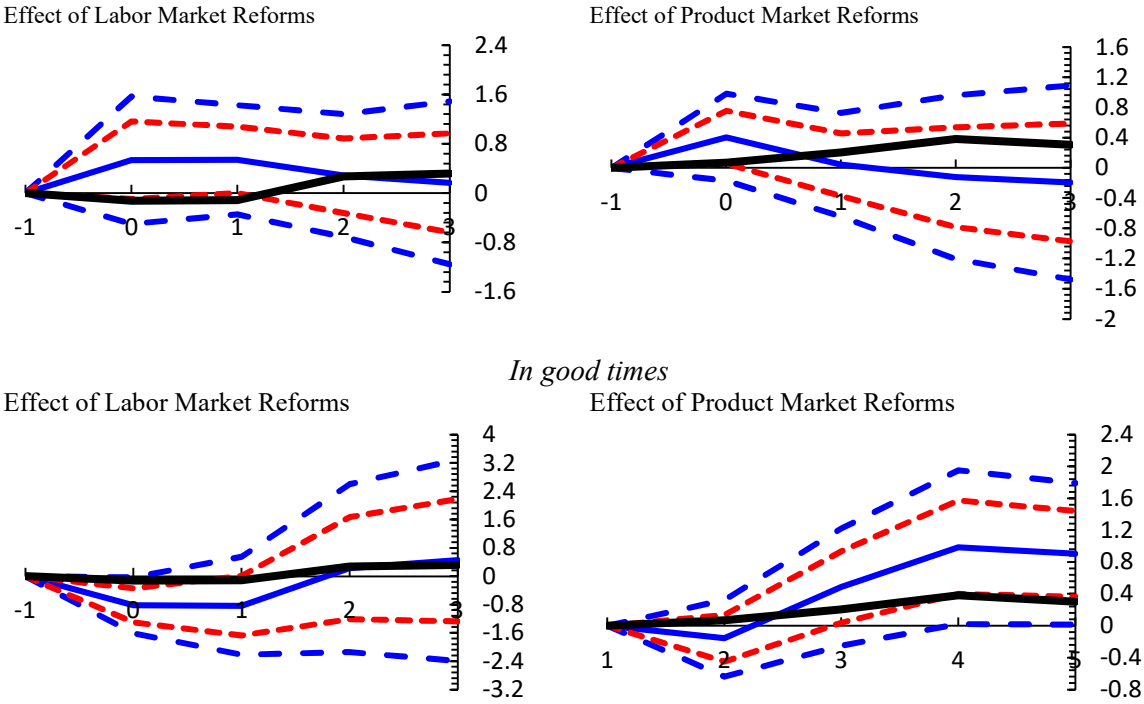
[12] $F(z_{it})$=0.5 is the cutoff between weak and strong economic activity.
[13] Our results hardly change when using alternative values of the parameter γ, between 1 and 6.

Figure 5. Effect of Reforms on the Current Account (% of GDP) – the role of the business cycle



Note: x-axis in years; t=0 is the year of the shock. Solid blue lines denote the response to a major historical reform, blue dashed lines denote 90 percent confidence bands and red dashed lines denote 68 percent confidence bands, based on standard errors clustered at country level. The solid black lines denote the unconditional (baseline) result for the current account.

Figure 6. Effect of Reforms on Saving (% of GDP) – the role of the business cycle

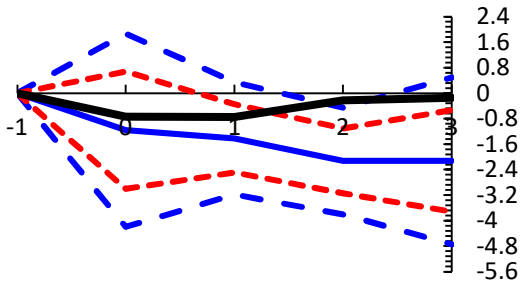


Note: x-axis in years; t=0 is the year of the shock. Solid blue lines denote the response to a major historical reform, blue dashed lines denote 90 percent confidence bands and red dashed lines denote 68 percent confidence bands, based on standard errors clustered at country level. The solid black lines denote the unconditional (baseline) result for saving.

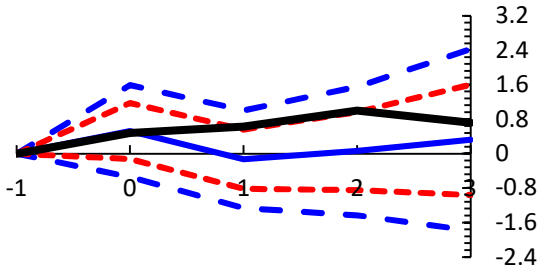
Figure 7. Effect of Reforms on Investment (% of GDP) – the role of the business cycle

In bad times

Effect of Labor Market Reforms

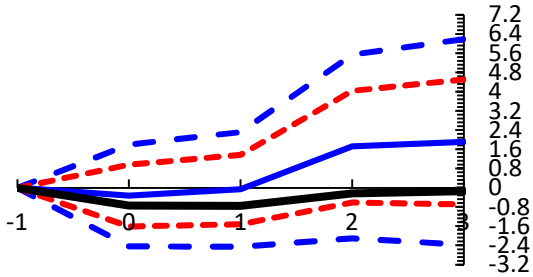


Effect of Product Market Reforms

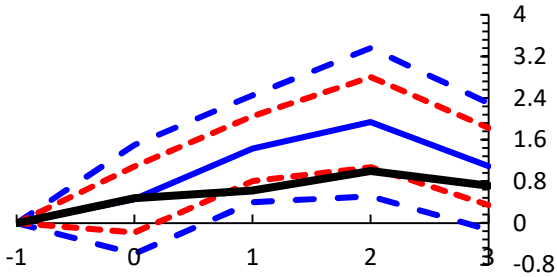


In good times

Effect of Labor Market Reforms



Effect of Product Market Reforms

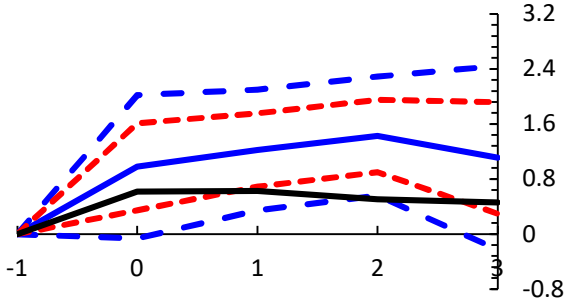


Note: x-axis in years; t=0 is the year of the shock. Solid blue lines denote the response to a major historical reform, blue dashed lines denote 90 percent confidence bands and red dashed lines denote 68 percent confidence bands, based on standard errors clustered at country level. The solid black lines denote the unconditional (baseline) result for investment.

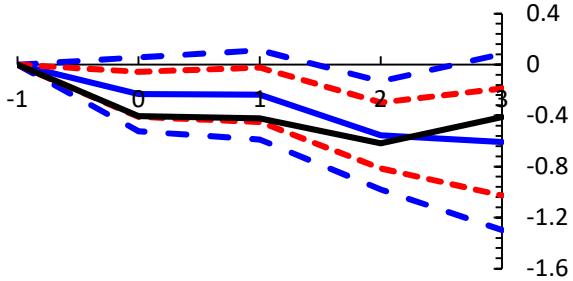
Figure 8. Effect of Reforms on the Current Account (% of GDP) – the role of the business cycle, robustness check (using simple dummy variable for bad times rather than smooth transition function)

In bad times

Effect of Labor Market Reforms

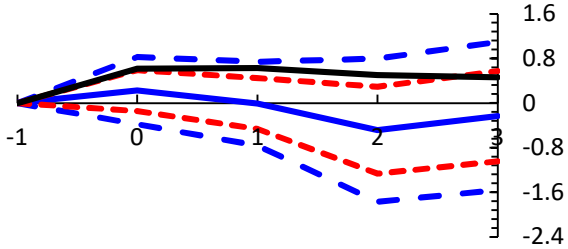


Effect of Product Market Reforms

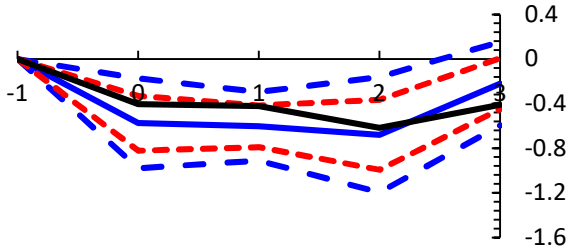


In good times

Effect of Labor Market Reforms



Effect of Product Market Reforms



Note: x-axis in years; t=0 is the year of the shock. Solid blue lines denote the response to a major historical reform, blue dashed lines denote 90 percent confidence bands and red dashed lines denote 68 percent confidence bands, based on standard errors clustered at country level. The solid black lines denote the unconditional (baseline) result for the current account.

VI. CONCLUSION

This paper shows new evidence that product market deregulation is associated with a deterioration in the current account while labor market deregulation with an improvement, using a new "narrative" database of major changes in employment protection for regular workers and product market regulation for non-manufacturing industries that covers 26 countries over the past four decades. These effects are both statistically and economically significant in the short term and tend to decline over the medium term. Overall, in terms of both sign and duration, these results are broadly consistent with theoretical predictions from recent DSGE models with endogenous producer entry and labor market frictions (Cacciatore and Fiori, 2016; Cacciatore et al., 2016a,b).

Our results leave some questions open for future research. Perhaps most importantly, cross-country differences in market regulations go way beyond the two (important) areas covered in this paper and include, among others, regulations in areas such as financial markets, pension and healthcare systems, and international trade and foreign direct investment. A more systematic investigation of their aggregate effects on saving, investment and the current account than has been the case to date seems warranted to better understand the broad role of structural policies for global imbalances. In addition, the effect of reforms on macroeconomic conditions, and thereby on the current account, is likely to vary across countries depending on their specific structural characteristics. Further investigating these could shed light on the extent and underlying drivers of cross-country heterogeneity in the current account impacts of reforms. Finally, this broad macroeconomic research agenda should be supported by more micro-econometric analyses at household (saving) and firm (investment) levels, in order to shed light on the mechanisms through which labor and product market reforms affect the current account.

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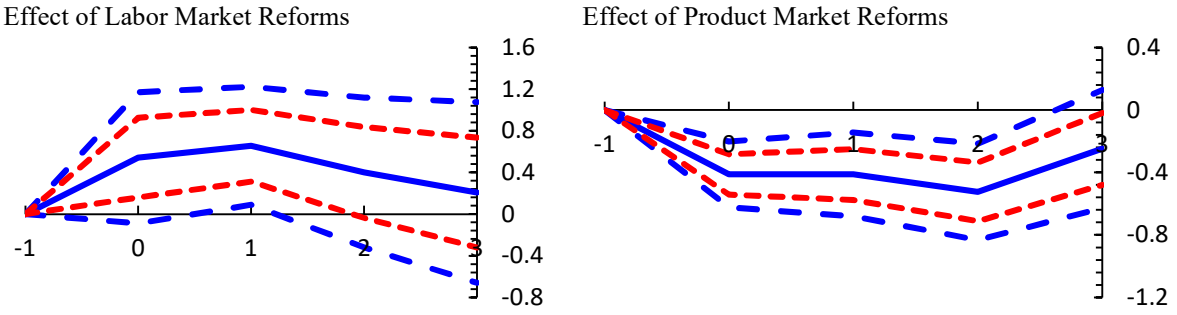
ANNEX

Sensitivity and Robustness checks

Controlling for year fixed effects and country-specific time trends

The baseline specification does not include year fixed effects to allow for waves of reforms—that is, the possibility that both labor and product market reforms may occur within the same year in many countries. Indeed, in these circumstances, including time fixed effects would "partial-out" these reforms and affect the overall estimated effects of reforms on the current account balance. To check the robustness of our results, we re-estimate equation (1) including year fixed effects. The estimated effects of reforms, which are presented in Figure A1, are qualitatively similar to, although less persistent than those obtained without year fixed effects.

Figure A1. Effect of Reforms on the Current Account (% of GDP) – controlling for year fixed effects

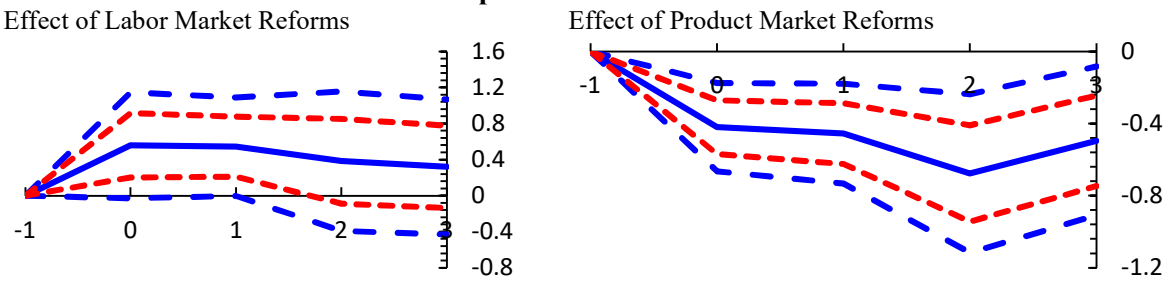


Note: x-axis in years; t=0 is the year of the shock. Solid lines denote the response to a major historical reform, blue dashed lines denote 90 percent confidence bands and red dashed lines denote 68 percent confidence bands, based on standard errors clustered at country level.

To estimate the causal impact of reforms on the current account balance, it is important to control for previous trends in the current account that could lead to reforms. The baseline specification attempts to do this by controlling for up to three lags in the current account balance.[14] To further mitigate this concern, we re-estimate equation (1) by including country-specific time trends as additional control variables. Also in this case, the results are similar to, and not statistically different from, the baseline results (Figure A2).

[14] Similar results are obtained when using alternative lag parametrizations.

Figure A2. Effect of Reforms on the Current Account (% of GDP) – controlling for country-specific time trends



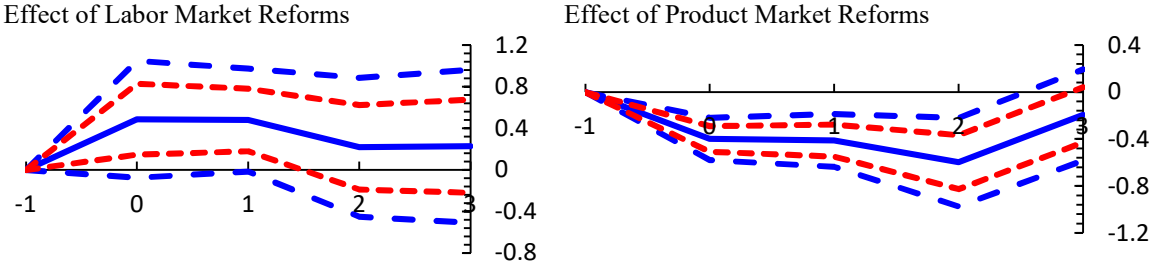
Note: x-axis in years; t=0 is the year of the shock. Solid lines denote the response to a major historical reform, blue dashed lines denote 90 percent confidence bands and red dashed lines denote 68 percent confidence bands, based on standard errors clustered at country level.

Controlling for additional short-term drivers of the current account

As discussed in the main text, a possible concern regarding the analysis is that the results may suffer from omitted variable bias, as reforms may be carried out because of past economic conditions or at the same time of other macroeconomic policy actions affecting the current account. To address this issue, we expand the set of controls to include other macroeconomic variables that have been typically found to affect the current account (see e.g. IMF, 2018, 2019). In particular, we include lagged changes of (i) domestic demand; (ii) foreign demand; (iii) real exchange rates; (iv) term of trade; and current and lagged changes in (iv) short-term interest rates—to capture monetary policy actions; (v) general government primary budget balance—to capture fiscal policy actions; (iv) the Chinn-Ito index of capital controls; (vii) and EPL and PMR reforms in major trading partners.[15]

The results obtained with this analysis are very similar to, and not statistically different from, those obtained in the baseline specification, suggesting that this source of omitted variable bias is likely to be negligible in our setting (Figure A3).

Figure A3. Effect of Reforms on the Current Account (% of GDP) – controlling for other current account determinants



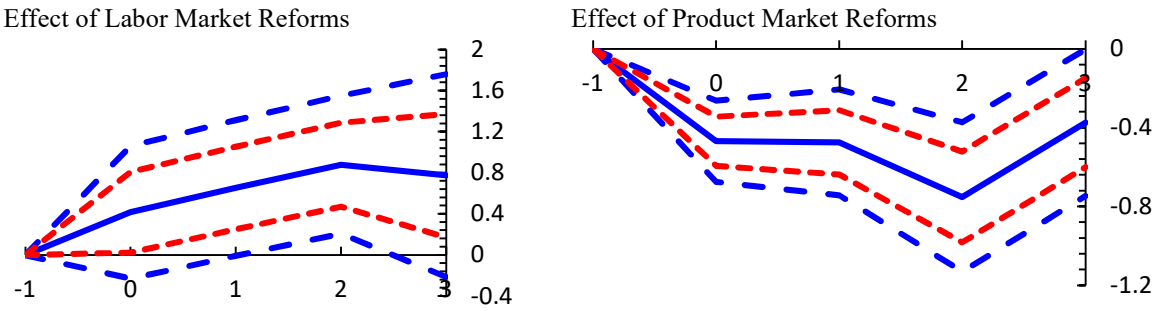
Note: x-axis in years; t=0 is the year of the shock. Solid lines denote the response to a major historical reform, blue dashed lines denote 90 percent confidence bands and red dashed lines denote 68 percent confidence bands, based on standard errors clustered at country level.

[15] The series (i)-(v) are taken from the IMF World Economic Outlook database. The Chinn-Ito index is taken from http://web.pdx.edu/~ito/Chinn-Ito_website.htm; EPL and PMR reforms in trading partners are based on our calculations.

Controlling for other reforms

Another potential source of omitted variable bias is that EPL and PMR reforms may be implemented as part of broader packages of labor and product market reforms. To address this issue, we re-estimate our main regression by controlling for reforms in the following additional areas: labor tax wedge, unemployment benefits replacement rate, and EPL for temporary contracts. [16] Annual labor tax wedge changes (in percent) are sourced from the OECD's Taxing Wages, while major reforms in the areas of unemployment benefits and EPL for temporary contracts are drawn from Duval et al. (2018), based on the same methodology used to identify our major regular EPL reforms. Figure A4 shows that such augmentation of the vector of controls does not change the basic thrust of our results. Among the other reforms considered, we find that a one percentage point reduction in the tax wedge is associated with a statistically significant and persistent deterioration in the current account balance, in line with the direct negative effect of such tax cuts on net public saving. The effects of reforms in the areas of unemployment benefits and EPL for temporary contracts are not found to be statistically significant (Figure A5).

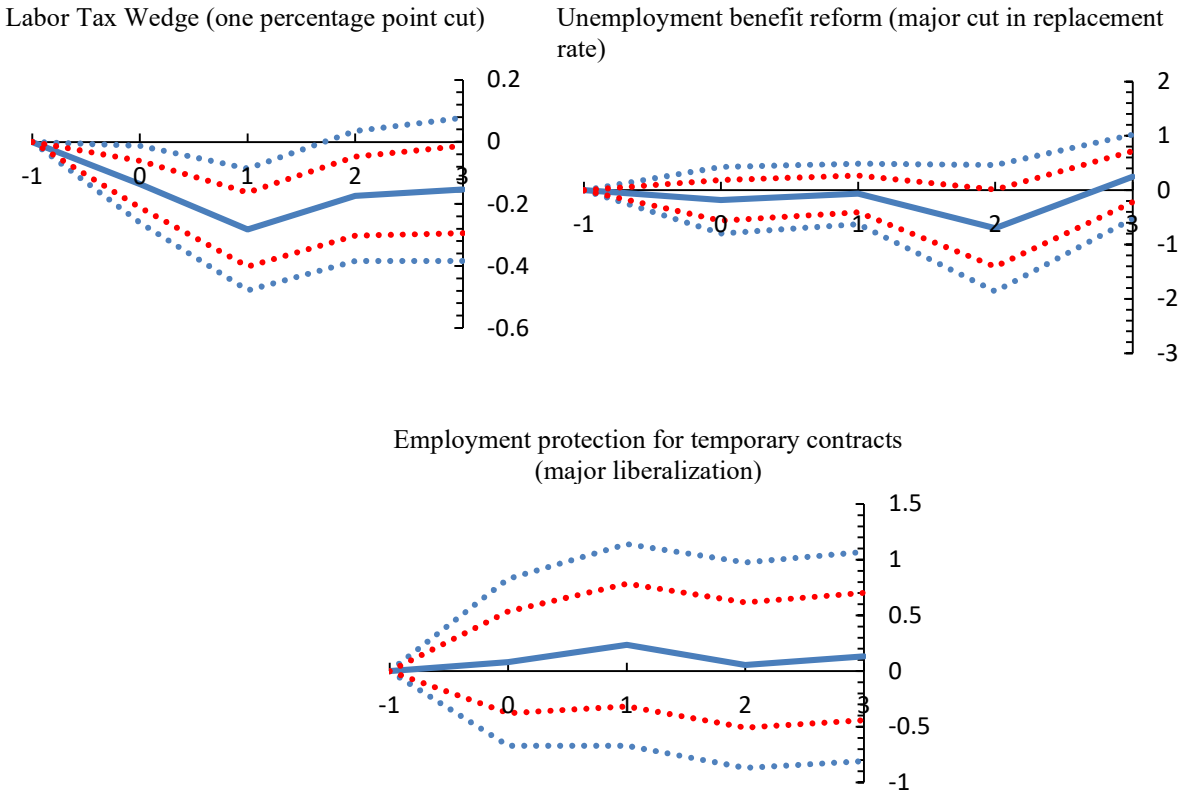
Figure A4. Effect of Reforms on the Current Account (% of GDP) – controlling for other reforms



Note: x-axis in years; t=0 is the year of the shock. Solid lines denote the response to a major historical reform, blue dashed lines denote 90 percent confidence bands and red dashed lines denote 68 percent confidence bands, based on standard errors clustered at country level.

[16] The vector $X_{i,t}$ in equation (1) was augmented to include up to three lags of the additional reforms mentioned.

Figure A5. Effect of Other Labor Market Reforms on the Current account (% of GDP)

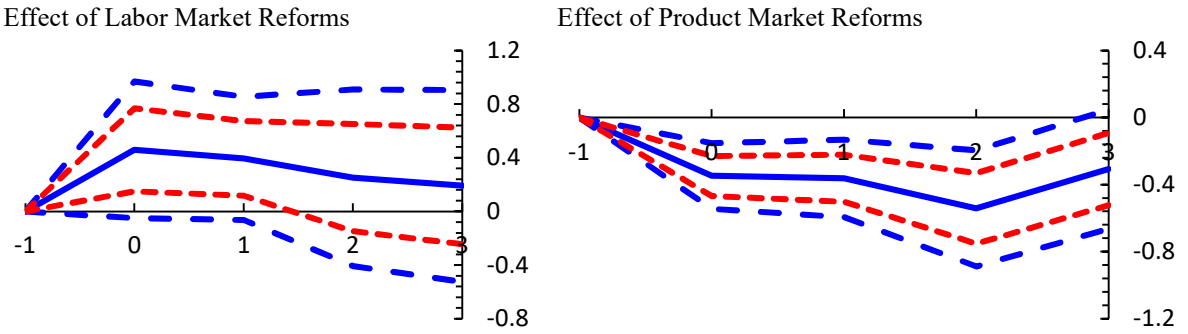


Note: x-axis in years; t=0 is the year of the shock. Solid lines denote the response to a major historical reform, blue dashed lines denote 90 percent confidence bands and red dashed lines denote 68 percent confidence bands, based on standard errors clustered at country level.

Controlling for GDP growth expectations

Another source of endogeneity is that reforms may be implemented because of concerns regarding future economic growth. To address this issue, we control for the expected values in *t-1* of future real GDP growth rates over periods *t* to *t+k*—that is, the time horizon over which the impulse response functions are computed. These are taken from the fall issue of the *IMF World Economic Outlook* for year *t-1*. Results in Figure A6 show that controlling for expectations of current and future growth delivers results that are very similar to, and not statistically significantly different from, those reported earlier.

Figure A6. Effect of Reforms on the Current Account (% of GDP) – controlling for growth expectations

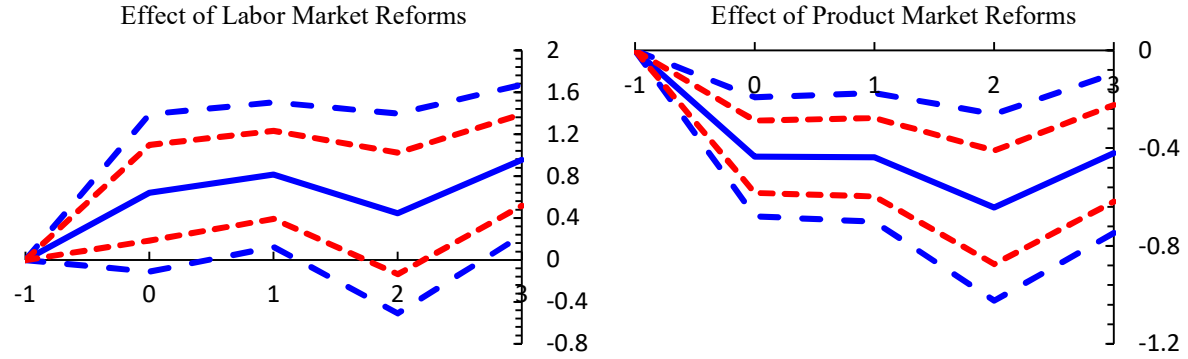


Note: x-axis in years; t=0 is the year of the shock. Solid lines denote the response to a major historical reform, blue dashed lines denote 90 percent confidence bands and red dashed lines denote 68 percent confidence bands, based on standard errors clustered at country level.

Reform reversals and reforms vs "counter-reforms"

Estimates could be biased if reforms are followed by subsequent reversals. In practice, however, this bias is negligible, as there are only very few such cases in our sample, as mentioned earlier. Furthermore, results are robust to controlling for future reforms (major liberalization measures) and "counter-reforms" (major increases in the stringency of regulation). Results are also robust to focusing only on reform episodes—as opposed to both reforms and "counter-reforms" as the baseline regression does (Figure A7).

Figure A7. Effect of Reforms on the Current Account (% of GDP) – liberalizing reforms only



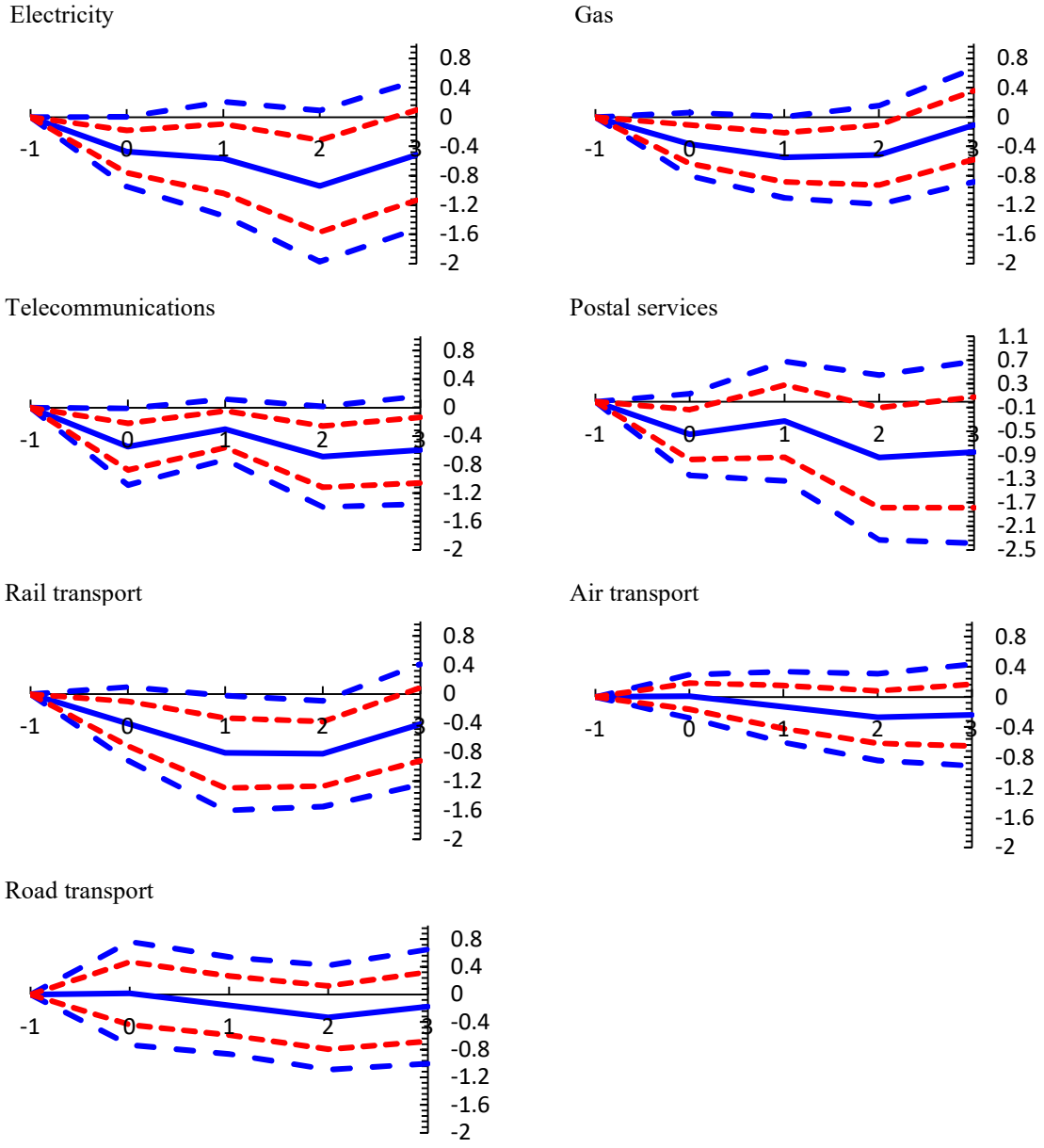
Note: x-axis in years; t=0 is the year of the shock. Solid lines denote the response to a major historical reform, blue dashed lines denote 90 percent confidence bands and red dashed lines denote 68 percent confidence bands, based on standard errors clustered at country level.

Sectoral PMR reforms

In the analysis, we compute the economy-wide PMR reform variable by aggregating (summing up) PMR reforms in each sector. An interesting question is whether the effect of product market deregulation on the current account varies across sectors. To address this question, we re-estimate our main regression for reforms in the each of the following individual areas: telecoms, postal services, electricity, gas, air transport, rail transport, and road transport. The results suggest that reforms in all of these individual sectors are associated with a decline

in the current account balance, with the effect being larger (in absolute value) for postal services, telecom, electricity and rail transport (Figure A8). Statistical significance is less than when considering our aggregate reform indicator (that adds up all of the reforms in all individual areas) because some of these individual sector reforms were implemented simultaneously—some countries liberalized gas and electricity simultaneously, for example.

Figure A8. Effect of Different PMR Reforms on the Current Account (% of GDP)



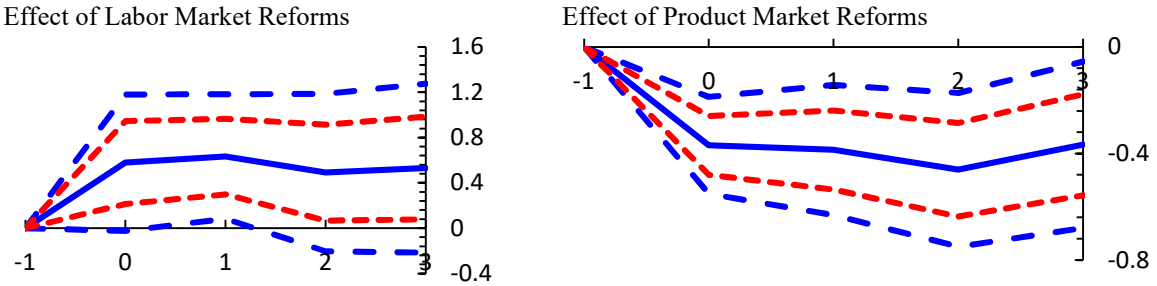
Note: x-axis in years; t=0 is the year of the shock. Solid lines denote the response to a major historical reform, blue dashed lines denote 90 percent confidence bands and red dashed lines denote 68 percent confidence bands, based on standard errors clustered at country level.

Instrumental Variable Estimation

While the previous robustness checks go a long way toward mitigating endogeneity concerns, we still check the robustness of our results by using an IV approach. The literature has put forward several theories to rationalize why and when reforms (do not) happen. We focus on one broad factor examined in the literature: *political institutions* (see Duval, Furceri and Miethe (2018) for a recent contribution). Specifically, we use the following set of political economy variables as external instruments which we divide in four categories: i) ideology of the governing party/ies, using a discrete variable to distinguish between left, center and right (3, 2 and 1, respectively) (*Parties*);[17] ii) political system, using a discrete variable for parliamentary, assembly-elected and presidential forms of governments (2, 1 and 0, respectively) (*System*);[18] iii) party fragmentation, using a continuous variable bounded between 0 (no fragmentation) and 1 (maximum fragmentation) to capture the number of political parties in the lower house of the legislative assembly (*Fragmentation*);[19] iv) the strength of democratic institutions (measured as polity IV and normalized between 0 and 1) (*Democ*).[20] Data on these variables are taken from the World Bank Database of Political Institutions.

By means of a two-stage least squares estimator, we re-estimate equation (1) using up to two lags of the four political economy instruments described above.[21] The results reported in Figure A9 are similar to, and not statistically different from those obtained using OLS, confirming that endogeneity is not a serious concern in our case.

Figure A9. Effect of Reforms on the Current Account (% of GDP) – Instrumental Variables



Note: x-axis in years; t=0 is the year of the shock. Solid lines denote the response to a major historical reform, blue dashed lines denote 90 percent confidence bands and red dashed lines denote 68 percent confidence bands, based on standard errors clustered at country level.

[17] Some papers have found right-wing governments to be generally associated with more market-oriented reforms (Alesina and Roubini 1992).

[18] Persson (2002) argues that in countries with presidential forms of government, reform implementation faces less effective opposition than in countries with parliamentary systems.

[19] In countries where with higher political fragmentation the government may find it more difficult to implement reforms (Haggard and Webb, 1994; Roubini and Sachs, 1989).

[20] While democracy can hinder reforms if special interests prevail on general welfare, democratic rulers are typically more sensitive to the interest of the public, and so more prone to implement reforms that benefit a large share of the population (Giuliano et al. 2013).

[21] To check the validity of our instruments and assess the strength of our identification, we rely on the Kleibergen-Paap (KP) and Hansen statistics. The KP statistics rejects the null that the different equations are unidentified (using Stock-Yogo critical values). The Hansen test statistics suggests that the set of instruments is valid—that is, uncorrelated with the error term.