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Labor and Product Market Reforms in Advanced Economies: Fiscal Costs, Gains, and Support

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I. DATA AND EMPIRICAL METHODOLOGY

A. Data

Major reforms in the areas of product market regulation, employment protection, unemployment benefits, active labor market polices, and labor taxation are identified following a "narrative approach" described in Chapter 3 of the April 2016 IMF World Economic Outlook (for details, see Duval and others, 2016; IMF, 2016). The dataset covers major policy changes in each of these areas for 26 advanced economies over the period 1970-2013—or that covered by OECD Economic Surveys, where shorter. Reform areas include: product market regulation (e.g., deregulating retail trade, professional services, and certain segments of network industries, primarily by reducing barriers to entry); employment protection legislation reforms (e.g., easing hiring and dismissal regulations for regular workers); increasing the ability of and incentives for the unemployed to find jobs by reducing the level or duration of unemployment benefits or by increasing the resources for and the efficiency of active labor market policies (ALMPs), including targeted policies to boost participation of underrepresented groups; and cutting labor tax wedges.

The main advantage of the reform dataset used in this note is to identify the precise nature and timing of significant legislative and regulatory actions taken by advanced economies since the early 1970s in key individual labor and product market policy areas. These four major gains (nature and timing of policy actions, coverage length and breadth) come with two main drawbacks that are common in any cross-country time-series analysis of the impact of structural reforms. First, two large reforms in a given area (for example, employment protection legislation) can involve different specific actions (for example, a major simplifications of the procedures for individual and collective dismissals, respectively). Furthermore, the approach does not rely on a common single metric to identify reforms. As a result, only the average historical impact of major reforms on budgetary outcomes can be estimated. For example, it could well be that product market reforms entail no upfront fiscal cost on average across countries over the sample considered, even though fiscal costs were clearly incurred in specific cases. A second potential drawback of the analysis is that reforms may be themselves driven by macroeconomic outcomes, including budgetary outcomes, and may be coincident with reforms in other areas—this issue will be addressed in the empirical analysis.

Empirical strategy. The empirical methodology used to estimate the dynamic impact of major policy changes—both reforms and "counter-reforms"—on budgetary outcomes follows the approach proposed by Jordà (2005) to estimate impulse-response functions. This approach has been advocated by Stock and Watson (2007) and Auerbach and Gorodnichencko (2012), among others, as a flexible alternative to vector autoregression (autoregressive distributed lag) specifications since it does not impose dynamic restrictions. It is also particularly suited to estimating nonlinearities (including interactions between shocks and other variables of interest, such as prevailing macroeconomic conditions at the time of reform or the stance of fiscal policy) in the dynamic response. 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 a particular budgetary outcome (debt-to-GDP ratio); α_i are country fixed effects, included to take account of differences in countries' average budgetary outcomes; γ_t are time fixed effects, included to take account of global shocks such as shifts in the global business cycle; R denotes the reform; and X is a set of control variables including past budgetary outcomes, past reforms, and recession dummies. In order to assess the extent to which the response of budgetary outcomes to reforms varies with the state of the economy and the stance of fiscal policy, the baseline specification is extended as follows:

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

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

in which z is an indicator of the state of the economy (or the stance of fiscal policy) normalized to have zero mean and unit variance, and Z is a set a of control variables including past budgetary outcomes, past reforms, recession dummies, and the state of the economy or the stance of fiscal policy.[1] The indicator of the state of the economy considered in the analysis is GDP growth.[2] The indicator of the stance of fiscal policy is a government consumption shock, identified as the forecast error of government consumption expenditure relative to GDP (for a similar approach see, for example, Auerbach and Gorodnichenko 2012, 2013; Abiad, Furceri, and Topalova 2015).[3]

Equations (1) and (2) are estimated for each $k = 0, \ldots, 4$. Impulse response functions are computed using the estimated coefficients β_k, and the confidence bands associated with the estimated impulse-response functions are obtained using the estimated standard errors of the coefficients β_k, based on clustered robust standard errors. The macroeconomic series used in the analysis come from the OECD's *Economic Outlook* database, which covers an unbalanced sample of 26 OECD economies over the period 1970–2014. The forecasts of government consumption used in the analysis are those reported in the fall issue of the OECD's *Economic Outlook* for the same year, and are taken from the OECD's Statistics and Projections database.

[1] The advantage of this approach is twofold. First, compared with a model in which each dependent variable is interacted with the level of unemployment rate or business cycle measures it allows to directly test whether the budgetary effect of reforms varies across different regimes such as recessions (for example, output growth below a given threshold) and expansions. Second, compared with estimating structural vector autoregressions for each regime, it allows the budgetary 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.

[2] Following Auerbach and Gorodichencko (2012) we use $\gamma = 1.5$ for the analysis of recessions and expansions. Periods of very low (high) growth identified in this analysis also correspond to periods of large negative (positive) output gaps.

[3] This procedure also overcomes the problem of fiscal foresight because it aligns the economic agents' and the econometrician's information sets. We use $\gamma = 1$ to assess the role of the fiscal policy stance.

We address endogeneity and omitted variable bias concerns as follows. Endogeneity could result from the impact of expected budgetary outcomes—for instance, fast-growing public debt—on the likelihood of reforms. Omitted variable bias may arise from the fact that reforms can occur across different areas at the same time. In order to address this, we check for the robustness of the results to including all reforms across all areas simultaneously in the estimated equation. Finally, estimates could be biased in the event of reform reversals. In practice, however, this bias is negligible, as there are only very few such cases.

II. COST BENEFIT ANALYSIS OF STRUCTURAL REFORMS: A CONCEPTUAL FRAMEWORK

The simulations of the net fiscal benefits associated with various structural reforms are based on a theoretical framework inspired by DeLong and Summer (2012). Specifically, the DeLong-Summer (D-S) model is modified on two fronts. First, instead of analyzing the long-term fiscal impact of fiscal stimulus, we focus on the effect of structural reform shocks, with or without complement fiscal stimulus. Second, we make a more conservation assumption in assuming that when reform is accompanied by fiscal stimulus, the medium-term effect of the latter is zero—I other words, we do not consider output and tax revenue gains that may materialize if fiscal stimulus raises potential output, as may happen if there is hysteresis or if stimulus increases supply e.g. through infrastructure projects. The framework captures both the direct and indirect fiscal costs of various structural reforms. This appendix first briefly presents the basic features of the D-S model, before turning to the main equations of the modified model used to capture the impact of structural reforms on public finances.

A. DeLong and Summers (D-S) Framework

The D-S model examines the role of discretionary fiscal policy during a severe downturn when interest rates reach the zero nominal lower bound. In the short term, discretionary fiscal policy (e.g., higher spending) affects the debt-to-potential GDP ratio through its impact on the numerator, while the denominator (potential GDP) remains unaffected. The change in the numerator reflects the increase in spending minus the additional taxes that are collected as a result of a temporary increase in output captured by the short-term fiscal multiplier. More formally, in the short term, the dynamics of the debt-to-potential GDP ratio is governed by the following equation:

$$(1)\ \Delta D = (1-\mu_S\tau)\Delta G,$$

where D is the debt-to-potential-GDP ratio, G is the government spending-to-potential GDP ratio, μ_S represents the short-term fiscal multiplier, and τ stands for the marginal tax rate. In the medium-term, the financing burden imposed by the additional debt incurred to finance the fiscal expansion is capture by following equation:

$$(2)\ (r-g)\Delta D = (r-g)(1-\mu_S\tau)\Delta G,$$

where r is real government borrowing and g the economy's long run growth rate, both of which are assumed to exogenous.
At the same time, discretionary fiscal policy expansion generates a tax dividend given by:

(3) $\tau\Delta Y = \tau\eta\mu_S\Delta G$,

where η is the spillover effect of the short-term increase in GDP that will persist in the medium/long term, and captures a hysteresis effect (of changes in current output on potential output).

As a result of the above, discretionary fiscal policy is self-financing over the medium/long term when the revenue dividend identified in (3) exceeds the cost of additional borrowing incurred to finance discretionary fiscal policy (2). Specifically, combining (2) and (3), the following self-financing condition must hold:

(4) $(r-g)(1-\mu_S\tau) - \tau\eta\mu < 0$

B. Adapting the Framework to the Case of Structural Reforms

The D-S model is modified to examine how structural reforms affect public finances in the short and medium term, as well as the impact on public finances of packages combining temporary upfront fiscal policy stimulus with structural reforms. The reforms considered here are discussed in the previous section and include: product market deregulation (PMR), changes to employment protection legislation for regular workers (EPL), tax wedge reductions, and active labor market policy (ALMPs).[4] In addition, for simplicity and to obtain conservative estimates of the fiscal net benefits associated with different reforms, any direct effects of changes in short-term output on medium-term output are ignored. In other words, unlike in the D-L framework, we assume that there are no hysteresis effects. A distinction is made between the short-term fiscal multiplier, which is assumed to positive, and the medium-term fiscal multiplier, which is set equal to zero (see Table AI below). The self-financing conditions for each reform type are derived below.

Product Market Reforms (PMR)

The short-term impact on output of PMR and fiscal expansion (including their interaction) is given by:

(5) $\Delta Y = \mu_S\Delta G + \epsilon_S Y_0 R$,

[4] Fiscal support affects the probability of PMR by helping overcome political economy obstacles to their implementation but does not seem to have an impact on the response of output to such reforms. On the other hand, fiscal support is assumed to affect the output response to EPL reforms.

Where Y and G are output and public spending in levels, ϵ_S is the short-term impact of reforms on output, Y_0 is the initial output at the time of the reform, and R is a reform dummy that takes value 1 when reform is implemented. At the same time, the short-term impact of reform and fiscal expansion on public debt (also in levels) is captured by the following equation:

(6) $\Delta D = (1-\mu_S\tau)\Delta G - \tau\epsilon_S Y_0 R.$

In the medium-term, the financing burden imposed by the additional debt incurred to finance PMR measures and fiscal expansion is given by:

(7) $(r-g)\Delta D = (r-g)[(1-\mu_S\tau)\Delta G - \tau\epsilon_S Y_0 R],$

while the medium-term impact of reform and fiscal expansion on output follows:

(8) $\Delta Y = \epsilon_M Y_0 R,$

where ϵ_M is the medium-term impact of a reform on output defined as the output effect after five years as estimated in IMF (2016a), and the fiscal multiplier is assumed to be zero at this horizon.
Accordingly, the medium-term tax dividend associated with a reform and fiscal expansion is:

(9) $\tau\Delta Y = \tau\epsilon_M Y_0 R.$

Combining (7) and (9) it is possible to determine the following self-financing condition for PMR:

(10) $(r-g)\Delta D - \tau\epsilon_M Y_0 R \equiv (r-g)[(1-\mu_S\tau)\Delta G - \tau\epsilon_S Y_0 R] - \tau\epsilon_M Y_0 R < 0$

Dividing both sides of (10) by potential output $\bar{Y}$ and assuming that $Y_0 \approx \bar{Y}$ and R=1, the self-financing condition can be rewritten in terms of potential GDP as follows:
(11) $(r-g)[(1-\mu_S\tau)\Delta s - \tau\epsilon_S] - \tau\epsilon_M < 0$

where s is the public spending-to-potential GDP ratio ($G/\bar{Y}$) and hence $\Delta s = \Delta G/\bar{Y}$. The self-financing condition is tested for reforms accompanied by a fiscal stimulus ($\Delta s=0.01$) and reforms without fiscal stimulus ($\Delta s=0$).

Employment Protection Legislation (EPL)

Given the negative output effect of EPL during weak economic times and the role of fiscal policy to offset it, additional parameters γ_S and γ_M are introduced to represent the short- and medium-term interaction of fiscal expansion with output.

The short-term impact on output of structural reforms and fiscal expansion (including their interaction) is given by:

(12) $\Delta Y = \mu_S \Delta G + \tau(\epsilon_S + \gamma_S \Delta G) Y_0 R$,

where $\gamma_S > 0$ captures the positive impact of fiscal stimulus on the short-term response of output to EPL reform, as discussed in IMF (2016a). Accordingly, the short-term impact of structural reforms and fiscal expansion (including their interaction) on public debt is:

(13) $\Delta D = (1-\mu_S \tau)\Delta G - \tau(\epsilon_S + \gamma_S \Delta G) Y_0 R$.

In the medium-term, the financing burden imposed by the additional debt incurred when implementing EPL measures and fiscal expansion is given by:

(14) $(r-g)\Delta D = (r-g)[\ (1-\mu_S \tau)\Delta G - \tau(\epsilon_S + \gamma_S \Delta G) Y_0 R\ ]$,

while the medium-term impact of structural reform and fiscal expansion (including their interaction) on output is:

(15) $\Delta Y = (\epsilon_M + \gamma_M \Delta G) Y_0 R$,

where $\gamma_M > 0$ represents the favorable impact of fiscal stimulus on the medium-term response of output to EPL reform. The size of γ_M is taken from IMF (2016a) and corresponds to the output effect of EPL reforms after five years. Against this backdrop, the medium-term tax dividend generated by the package combining EPL reform and fiscal expansion (including their interaction) is:

(16) $\tau \Delta Y = \tau(\epsilon_M + \gamma_M \Delta G) Y_0 R$.

The self-financing condition for EPL is derived by combining (14) and (16):

(17) $(r-g)[(1-\mu_S\tau)\Delta G - \tau(\epsilon_S + \gamma_S\Delta G)Y_0R] - \tau(\epsilon_M + \gamma_M\Delta G)Y_0R < 0.$

Dividing both sides by $\bar{Y}$ and making the same assumptions as before, the self-financing condition in terms of potential GDP is:

(18) $(r-g)[(1-\mu_S\tau)\Delta s - \tau(\epsilon_S + \gamma_S\Delta G)] - \tau(\epsilon_M + \gamma_M\Delta G) < 0.$

Equation (18) can be tested along different dimensions, including presence or lack of fiscal stimulus (i.e., $\Delta s=0.01$ vs. ($\Delta s=0$) or prevailing macroeconomic conditions to reflect that the fiscal multiplier and impact of reform on output vary during normal and weak economic conditions. In particular, the self-financing condition without fiscal stimulus is:

(19) $(r-g)(- \tau\epsilon_S) - \tau\epsilon_M < 0.$

Tax Wedge and Active Labor Market Policies)

Tax wedge (TW) reforms and active labor market policies (AMLPs) have the distinctive characteristic of having permanent fiscal effects as their fiscal costs will be borne by the budget every year after the policy change is enacted. Accordingly, unless these reforms are implemented in a budget-neutral fashion, their medium-term financing burden includes a term that captures the permanent budgetary cost associated with reform. However, TW and ALMP reforms can also be implemented in a budget-neutral way. In this case, there is no direct fiscal cost and the change in the debt burden only reflects the output effect of the reform (i.e., $– \tau\epsilon_M\Delta s$). The self-financing conditions for TW and AMLP reforms are derived following an approach similar to that followed above for the other reforms.

Tables AI and AII provide a definition of the coefficients used in the framework, data sources, and coefficient estimates obtained from the regression analysis, respectively.

Table AI. Definition of Coefficients and Their Sources

Coefficient	Definition	Estimation	Source
τ	Marginal tax rate	Sample average for 1995-2015	WEO
r	Long-term real interest rate	(i) sample average for 2015-21, (ii) varied for robustness check.	WEO
g	Long-term real GDP growth rate	(i) sample average for 2015-21, (ii) varied for robustness check.	WEO
μ_S	Short-term fiscal multiplier	(i) 0.75, (ii) state-specific estimates	Estimated
μ	Medium-term fiscal multiplier	0	Assumption
ϵ_S	Short-term output impact of reforms	Impulse response function for 1st year	Estimated
ϵ_M	Medium-term impact of reforms interacted with fiscal expansion	Impulse response function for 5th year	Estimated
$\epsilon_S + \gamma_S$	Short-term impact of reforms interacted with fiscal expansion on output	Impulse response function for 1st year	Estimated
$\epsilon_M + \gamma_M$	Medium-term impact of reforms interacted with fiscal expansion on output	Impulse response function for 5th year	Estimated
R	dummy variable (=1 means reform, = 0 means no reform)	…	…

Table AII. Baseline Coefficient Estimates (Percent Values)

	Scenario / Parameters	Debt-Financed	Budget Neutral	Weak Economic Activity
Employment protection legislation	ϵ_S	-	0.10	-0.60
	ϵ_M	-	1.00	-2.40
	$\epsilon_S + \gamma_S \Delta G$	-	-	0.13
	$\epsilon_M + \gamma_M \Delta G$	-	-	3.50
Product market reforms [5]	ϵ_S	0.14	-	0.10
	ϵ_M	1.50	-	1.00
Labor tax wedge	ϵ_M	-	0.30	-
	γ_M	0.50	-	-
Active labor market policies	ϵ_M	-	0.20	-
	γ_M	0.30	-	-

Note: The coefficient estimates are obtained from the regressions described in IMF (2016a) and in Section 1.

[5] The effect of product market reforms does not depend on the fiscal stance.

C. Sensitivity Analysis

The self-financing condition (18) for a package combining temporary upfront fiscal stimulus with job protection reform under weak cyclical conditions is subject to a series of sensitivity tests. The objective of these tests is to determine the extent to which the net fiscal gain from such a package discussed in the main text varies with the real borrowing rate (r) and/or interest-growth differential (r – g), the short-term fiscal multiplier (μ_S)[6], and the medium-term impact of the reform ($\epsilon_M + \gamma_M \Delta G$). More specifically, Table AIII shows the critical values of the medium-term output impact of EPL reforms above which a package featuring EPL reform and fiscal stimulus in weak economic conditions is self-financing, for different values of the short-term fiscal multiplier and interest rate-growth differential. For example, if the interest-growth differential is 1 percent and the fiscal multiplier is 0.75, the reform package is self-financed when the medium-term output impact of reform exceeds 1.5 percent of GDP—below the baseline coefficient estimate. That critical value declines as the short-term fiscal multiplier gets larger and (r-g) becomes smaller. Overall, the results of the sensitivity tests suggest that under weak demand conditions, a package combining job protection reforms and temporary fiscal support can be self-financing under a range of reasonable assumptions on the size of the fiscal multipliers and the medium-term output impact of reform. This conclusion would be strengthened if account was made for the possibility that fiscal stimulus might raise output over the medium term—if there is hysteresis or stimulus finances infrastructure projects that increase supply, for instance—and the fact that the real interest rate is currently below the real GDP growth rate in many advanced economies. However, if real interest rates are high relative to the economy's growth rate, or might rise significantly in response to stimulus and lack of credibility of reforms, the chance that a package combining reform with fiscal stimulus can be self-financed over the medium term will be much less—especially if reforms are less ambitious or deliver smaller gains than expected.

Table AIII. Critical Values of Medium-Term Output Effect of EPL for Which Fiscal Stimulus is Self-Financing (In Percent)

	Value of Interest-Growth Differential (r-g)						
Short-Term Fiscal Multiplier	0.005	0.01	0.015	0.02	0.025	0.03	0.035
0.00	0.0118	0.0237	0.0355	0.0473	0.0591	0.0710	0.0828
0.50	0.0093	0.0187	0.0280	0.0373	0.0466	0.0560	0.0653
0.75	0.0081	0.0162	0.0242	0.0323	0.0404	0.0485	0.0565
1.00	0.0068	0.0137	0.0205	0.0273	0.0341	0.0410	0.0478
1.50	0.0043	0.0087	0.0130	0.0173	0.0216	0.0260	0.0303
1.75	0.0031	0.0062	0.0092	0.0123	0.0154	0.0185	0.0215
2.00	0.0018	0.0037	0.0055	0.0073	0.0091	0.0110	0.0128
2.25	0.0006	0.0012	0.0017	0.0023	0.0029	0.0035	0.0040

IMF Staff Estimates.

[6] While the simulations assume a positive short-term fiscal multiplier, the medium-term multiplier is assumed to be zero.

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