THE INTERACTION BETWEEN THE LABOUR TAX WEDGE AND STRUCTURAL REFORMS IN ITALY

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We present a quantitative analysis of Italian fiscal and structural reforms using the Prometeia Dynamic Stochastic General Equilibrium (DSGE) model to identify the optimal reform mix to boost growth and employment. We find that structural reforms *via* a reduction in price and wage markups and a labour tax wedge cut can provide a strong stimulus to the economy by increasing GDP and employment levels. The balanced budget constraint shows that to offset the decreased revenue due to the labour wedge cut, a reduction in public lump-sum transfers or a tax shift from labour to consumption or property is preferred over a cut in public spending on goods and services. Conversely, under simultaneous fiscal and structural reforms, the best payoff would be obtained from an expansion to public spending. Finally, we find that public investment works to magnify this effect in the long run.

Keywords: balanced budget, macroeconomic policy, public investment, taxes.

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1. Introduction

Italy has recently started to speed up the process of fiscal and structural reforms in response to European Commission requirements and internal policy willingness to achieve better macroeconomic performance. The importance of structural reforms is well known and, in the last few years, has been a constant in the economic policy recommendations of international economic institutions, particularly in European countries (OECD, 2013). The onset of the recent Great Recession has focused policy and economic debates on a faster and deeper adoption of structural and fiscal reforms to achieve higher sustainable growth, higher levels of employment and a consolidated fiscal situation with a balanced public budget and a lower level of public debt. In this context, the aim of the Treaty on Stability, Coordination and Governance in the Economic and Monetary Union (TSCG) – also known as the fiscal compact – is to increase the resilience of the European Monetary Union in the face of a crisis, through the application of stringent general criteria for budget deficits, structural deficits and the debt-to-GDP ratio. This requires European countries with low potential growth and high public debt to introduce definitive reforms to their economic systems in order to improve economic performance and meet the TSCG criteria.

The *golden rule* of the fiscal compact is ensuring budgetary discipline among European Union (EU) governments. The goal is for each country belonging to the fiscal compact to reduce the debt-to-GDP ratio to 60 per cent in the long run. This fiscal moderation has been accompanied by widespread implementation of structural reforms in the EU periphery. Nahtigal and Bugaric (2012), De Grauwe (2011) and Whelan (2012) discuss the danger of recessionary and deflationary effects. The main sources of doubt are related to: a) the long run expansionary effects of an *austerity* paradigm; b) evidence of the relationship between debt-levels and a growth regime; c) under-estimation of the deflationary and recessionary effects of a wide-ranging one-size-fits-all application of the fiscal compact on fragile countries in Europe.

Roubini and Mihm (2010) and Krugman (2012) argue that EU policy switched too rapidly to austerity after the onset of the crisis,

and this contributed to a worsening of the economic situation in 2012. In this context, Creel *et al.* (2012) and Creel *et al.* (2013) propose a counter-factual exercise using a VAR and DSGE methodology to rank several automatic fiscal rules and find the TSCG golden rule to be the worst performing instrument in relation to output gap and inflation rate. On the other hand, international institutions have contributed to the debate on quantitative assessment of fiscal and structural reforms providing a quite uniform consensus on their effects. In the case of Italy the OECD recommendations for structural reform (OECD, 2014) include a set of labour market, education system and tax structure improvements.[1] In general, given the fiscal consolidation requirements, one can rank these structural reforms based on the criteria of their performance and harmfulness. Cournède *et al.* (2013a) and Cournède *et al.* (2013b) suggest that reforms should start with the implementation of changes to subsidies, pensions, property taxes and personal income taxes, and that reforms to education, childcare, family expenditure, social security contributions, public investment and consumption taxes should be implemented only if absolutely necessary. In other words, the OECD countries should use the least harmful instruments to achieve their short-, medium- and long-run consolidation goals while Japan and the US are forced to impose more harmful reforms given their starting macroeconomic imbalances and long-run equity and growth needs. Italy is positioned in the best group for short-term equity and growth. The OECD study identifies various levers that Italy can use to achieve short- and medium-run goals: subsidies, pensions, other property taxes, unemployment benefits, personal income, corporate income taxes, environmental taxes, recurrent taxes, taxes on immovable property, and other government in kind consumption. The question of how heterogeneous growth patterns

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1. They include: 1) the rebalancing of protection, from jobs to workers' income, through a decrease in workers' job protection under certain types of contracts, and improvements to the social safety net; 2) increased equity and efficiency in education in order to get better value for money from the education system and improve the chances of the low-skilled; 3) increasing the efficiency of the tax structure by simplifying the tax code, fighting tax evasion and, when the fiscal situation permits, reducing the tax wedge on low-wage labour; 4) reducing the barriers to competition through stronger law enforcement at all levels of government, reduced public ownership and shorter waiting times in civil courts; 5) reducing the risk of persistent unemployment and accelerating return to work through enhanced active labour market policies.

in the euro area are shaped by fiscal policy measures compared to structural reforms is crucial and requires quantitative assessment of the interaction between these two policy instruments. Bouthevillain and Dufrénot (2013) argue that best practice is not a one-size-fits-all approach to growth-friendly fiscal consolidation.[2]

In general, the main structural changes advocated in the literature are labour and product market reforms, and their outcomes can depend on the time span and institutional framework. These reforms usually are modelled such that they imply an increase in the economic efficiency or a reduction in the bargaining power of economic agents and, therefore, affect real wages and relative prices in the economy. Barnes *et al*. (2011) evaluate the impact of policy reforms in terms of GDP per capita, in a review of a range of empirical studies conducted mostly by the OECD. They find that the largest long run per capita GDP gains seem to come from reforms to education, strengthening of competition in product markets, reductions in the level and duration of unemployment benefits, tax wedge cuts and less strict employment protection legislation. Overall, one-fifth of this long-run impact comes from product market deregulation, and one-fifth from reforms to the average tax wedge. Other significant gains come from increased human capital and lower unemployment benefits. Their review suggests that countries can be grouped according to their policy priorities. For example, in Italy the labour tax wedge could be reduced to the average OECD level to achieve an impact on GDP per capita equal to 8.4 per cent. Hobza and Mourre (2010) provide some stylised and illustrative results for the broad benefits of some types of policy measures envisaged by the European Commission's so-called Europe 2020 programme for EU countries, using the macroeconomic model QUEST III, DG ECFIN. They demonstrate the long-run effects of fiscal consolidation – on its own and in combination with structural reforms – and propose various scenarios. The structural reform scenarios suggest that progress in implementing structural reforms under the main

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2.   Emerging European countries are more sensitive than the most advanced countries to direct taxation measures and indirect taxation could have more harmful effects on growth rates in these countries. Increased human capital expenditure stimulates growth in low-growth countries, while welfare and sovereign spending are efficient for economies that are growing rapidly.

priority areas of Europe 2020 could generate significant gains in terms of increasing output and employment.[3] While the long-run consequences of structural reforms have been investigated extensively, the results of short-run analyses could be misleading. Cacciatore *et al.* (2012) explore the short-term effects of labour and product market reforms by applying a dynamic general equilibrium model with endogenous producer entry and labour market search, and matching frictions. They find that it takes time – typically two years – for reforms to pay off. This is partly because their benefits materialise gradually through the processes of firm entry and increased hiring whereas reform-driven layoffs are immediate. Also, although all reforms stimulate GDP in the short run, some, such as job protection reforms and product market reforms, result in temporary increases in unemployment.[4]

Implementing labour and product market reforms simultaneously helps to minimise such transition costs. Gomes *et al.* (2011) find that the effects of individual reforms are more or less additive by using EAGLE, a multi-country dynamic general equilibrium model. Bouis and Duval (2011) examine the impact on potential GDP over a 5 to 10-year horizon of structural reforms in product and labour markets, relying on the existing OECD empirical studies.[5] Both types of reforms raise productivity growth, although the effects are estimated to be smaller for labour market than product market reforms. In particular, for Italy, the estimated multifactor productivity gains from product market reform are found to be around 3 per cent and 7 per cent over a 5-year and

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3. In particular, GDP could increase from around 1.3 per cent up to 6.8 per cent depending on the boldness of the reform plan. The contribution to GDP of product market reforms would increase from 0.9 per cent to 3.3 per cent, while the contribution of labour market reforms would increase from 0.4 per cent to 2.9 per cent. Product market reforms could have a negative impact on the labour market of between -0.1 per cent and 0.1 per cent, while labour market reforms could have a positive impact of 0.6 per cent up to 4.3 per cent. The extent of economic benefits is conditional on the extent of the policy efforts (which needs to be very high for the most ambitious scenarios).

4. Cacciatore *et al.* (2012) argue that structural reforms can affect payoffs depending on whether the country is a member of a monetary union or not. Within a monetary union expectations about lower prices could increase real interest rates and decrease consumption and output in the short-run.

5. The authors state that the analysis implicitly assumes homogeneous marginal effects of reforms on GDP across different countries, time periods and magnitudes of reforms and, in some cases, assumes economy-wide impacts of reforms based on sector-level estimates. They assume also that the underlying OECD studies do a better job at estimating the long-run as opposed to the short-run effects of reforms.

10-year horizon respectively, and the gains from employment protection legislation are around 0.5 per cent over a 10-year horizon. The estimated long run increase in employment rates from labour tax wedge cuts is close to 2 percentage points for Italy.[6] Using the European Commission's QUEST III model for R&D, adapted to Italy, Annicchiarico *et al.* (2012) find that structural reforms are likely to result in sizeable output, consumption, employment and net foreign assets gains. However, these increases may be affected by fiscal consolidation intensity. The analysis covers a product and a labour market reform that includes lower price and wage markups and a shift from labour to consumption taxation. The authors find that under a fiscal consolidation package equivalent to 6 per cent of GDP, the effects of structural changes may be mitigated. However, the positive effects of structural reforms support fiscal consolidation *via* a decreased public debt-to-GDP ratio in the *ex ante* budget-neutral scenarios. The average annual output growth rate gain over a 10-year time horizon is found to be equal to 0.6 per cent under the assumption that Italy manages to halve the gap with the EU best performers in several intervention areas, in five years. Reducing the gap by one-third would imply an average annual gain of 0.4 per cent, while fully closing the gap would require increased average growth of up to 1 per cent. This result is very close to our scenario where product market reform under unbalanced budget gives an output increase of 1.25 percentage points while, when supported by public consumption, it could give more than 2 percent (see section 4 and appendix A). In a closely related paper, Lusinyan and Muir (2013) use the International Monetary Fund's Global Integrated Monetary and Fiscal model (GIMF) to analyse the role of structural and fiscal reforms in Italy aimed at strengthening competition in the product market and making the labour market more efficient supported by growth-friendly fiscal reforms. They find positive effects on GDP in the long run from both product and labour market reforms, and payoffs from their simultaneous implementation. In considering fiscal reforms, they take account, in a deficit-neutral way, of a

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6.   In general, the potential overall increase in GDP for the average OECD country gained by undertaking the full range of reforms to the labour and product markets, could be close to 10 per cent over a 10-year horizon, indicating the ample room for structural reforms to offset permanent GDP losses resulting from the recent crisis.

reduction in the labour tax wedge and an increase in infrastructure spending. In particular, they allow for a shift from direct to indirect taxes (lowering both labour and corporate taxes, offset by broadening the VAT base) and a shift from lump-sum transfers to productive, well-targeted infrastructure investment. Increasing competition in the tradable and non-tradable sectors could increase output by 4.0 per cent in 5 years and 7.7 per cent in the long run. The reduction in labour taxes initially raises GDP relative to the baseline by 0.5 per cent, and by up to 2 per cent in the long run. By combining fiscal reforms with product and labour market reforms, real GDP in Italy could increase by about 8.5 per cent after 5 years and almost 22 per cent in the long run.[7] Lusinyan and Muir (2013) find also that these effects would be stronger if the remaining euro area economies were to carry out contemporaneous similar reforms. Forni *et al.* (2010b) assess the effects of increasing competition in the service sector in Italy which, based on cross-country comparisons, is the OECD country with the highest markups in the non-manufacturing industries. They propose a two-region (Italy and the rest of the euro area) dynamic general equilibrium model allowing for monopolistic competition in the labour, manufacturing and service markets. They simulate the macroeconomic and spillover effects of increasing the level of competition in the Italian services sector, and find that decreasing service sector markups to the levels of the rest of the euro area increases Italian GDP by 11 per cent in the long run. Moreover they find, as in our paper, that labour market reform is less growth friendly than product market as it impacts only on some sectors of the economy. Forni *et al.* (2010a) evaluate fiscal policy consolidation *via* different fiscal coverage adjustments. First, given a certain level of Italian public debt, they find that a labor, capital and consumption tax cut gives positive and higher results than a reduction in public consumption and employment that has instead negative impacts on the economy. Then, in order to achieve a consolidation of 10 percent of debt-to-GDP ratio in five years, they state that the best fiscal mix is given by a decrease in public consumption, employment and in particular in public transfers, together with a generalized tax cut, because this would maximise the reduction of distortion and increase GDP

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7. The effect of product market reform is amplified by the productivity-enhancing effects of higher government spending on infrastructure.

levels. This result is qualitatively very close to our findings which show that transfers are the most growth friendly instrument to be used to cut the labour tax wedge. Our paper is close to the above-mentioned literature and focuses on the specific Italian fiscal dilemma related to the best growth friendly policy and the interaction effect between labor tax wedge and structural reform. The Italian specificities and structural and keynesian macroeconomic policies are taken into account to provide a systematic analysis of the fiscal policy outcomes.

As argued in Malinvaud (2000), the economic policy debate has a theoretical counterpart which consists of two strands: macro-economic policy and structural reform. Macroeconomic policy is related to the demand side of the economy, while structural reform refers to institutional changes. In some sense, they affect the supply-side of the economy since permanent institutional changes would affect the behaviour of the economy over the business cycle, or the *structural long-run equilibrium levels*. Thus, DSGE models are a good compromise to investigate macroeconomic and structural policies since they can represent institutional (market) frictions affecting the business cycle, demand shock transmission and long-run structural equilibrium levels simultaneously. Our paper contributes to this strand of the literature; we perform an analysis of mixed structural and macroeconomic policies within a balanced budget framework. For example, we allow for fiscal reforms to cut the labour tax wedge (that is both structural and macroeconomic), together with a simultaneous reduction in union monopolistic power via a decrease in real wages (structural) and also an expansion in public goods expenditure and public investment plans (macroeconomic). In particular, we are interested in comparing the fiscal balancing of a labour tax wedge cut, realised through a cut in public spending and transfers or a shift to indirect or property taxes. We examine a series of taxation mixes combined with structural reforms to the labour and product markets. We analyse the extra payoffs that may accrue from simultaneous structural and fiscal reforms. Unlike other studies on Italy, both fiscal and structural reforms are here implemented in a budget-neutral scenario. Fiscal reforms include cuts to taxes affecting labour costs, that is, firms' social security contributions (SSC), the regional tax on productive activities (IRAP), and personal income tax (IRPEF).

We find a dynamic trade-off for the tax rates analysed: a reduction in IRAP rate produces the highest payoff in terms of real GDP in the long run, while a cut in SSC results in the highest output in the short run. Similarly to Coenen *et al.* (2007), who focus on a reduction of public transfers to households to offset the tax revenue reduction from a labour tax wedge cut, we find that reducing firms' labour costs (IRAP plus SSC) has more notable effects on output in the long run than reducing the wedge component entering the households' decision problem, i.e. labour income tax (IRPEF).[8] However, unlike Coenen *et al.* (2007), we focus only on labour income tax for households, excluding households' SSC; on the other hand, we consider also the cost of IRAP together with the firms' SSCs.

In relation to structural changes, product market reforms outperform labour market reforms, in both the short and the long run. However, only labour market reforms lead to a permanent reduction in the unemployment rate. Moreover, the contemporaneous combination of cuts to the IRPEF, SSC and IRAP and structural reforms shows that, in accordance with a balanced budget, it would be preferable to increase public spending.

There are several points to bear in mind to interpret our results. First, the level or growth of GDP (alone) is not a satisfactory metric to evaluate economic policy. A welfare analysis is needed to achieve a more comprehensive understanding of the impact of policies on the several agent/sectors of the economy. Also, the analysis presented here is an aggregate analysis. Despite their complexity, by construction, DSGE models comprise a collection of heterogeneous representative agents, which means we have a multitude of agents represented by a single actor. This implies that we ignore progressive taxation and the distribution of wealth and income and concentrate on an average representation of the economic system. Second, our quantitative assessment exploits a stylised representation of the fiscal side of the economy: for

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8.   Coenen *et al.* (2007) consider four alternative scenarios for the euro area: a reduction in the consumption tax, a reduction in the sum of the tax on labour income and households' social security contributions, a reduction in the firms' social security contributions, the reduction of the overall tax wedge, i.e. a combination of the three single scenarios. The experiments are designed to lower the euro area tax wedge to levels prevailing in the United States. In all cases the reductions in tax revenue are offset by a reduction in public transfers to households.

example, transfers do not distinguish between pensions and social allowances which underestimates life cycle effects. Third, our results refer to a small open economy context, meaning that we ignore adjustments in the rest of the EU. Taking account of these points might change our results by weakening the fiscal and structural policy effects due to international spillover. However, the focus of this paper is to provide a quantitative assessment based on analysing the interactions among labour tax wedge reduction, structural reform and macroeconomic demand policy, to show that in a such complex environment a macroeconomic demand policy plays a prominent role.

The paper is organised as follows: in section 2 we briefly describe the model and the areas of policy intervention; section 3 discusses the calibration and experimental setup; section 4 and section 5 present the simulation results and sensitivity analysis; section 6 summarises the results of the public investment growth scenario; and section 7 concludes.

2. The model

In this section we briefly describe the model focusing on the policy areas of intervention. The reference framework is a new-Keynesian medium-scale DSGE model. We apply the Prometeia DSGE model for the Italian economy (Catalano, 2014 and Catalano and Pezzolla, 2014), and incorporate various tax rates including the household labour income, indirect, and labour wedge taxation (Figure). Structural reforms are modelled such that they imply a reduction in price and wage markups. Fiscal reforms include cuts to taxes affecting labour costs, that is, social contributions (SSC), the regional tax on productive activities (IRAP), and personal income tax (IRPEF). All reforms are implemented in a budget neutral scenario: in order to keep the public deficit constant in the face of the reduced revenues resulting from labour tax wedge cuts, we consider alternative scenarios allowing for a reduction in government spending, a cut in general transfers,[9] and a tax shift from labour to consumption (through an increase in the

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9.   The lump-sum nature of the transfers implies that households cannot change or alter them by changing their behaviour. They represent unconditional cash transfers meaning that they are general transfers delivered to households, with no limitations or exceptions.

VAT rate) or to real estate investment (through an increase in the TASI i.e. house services tax rate).[10]

Figure. Structure of the model
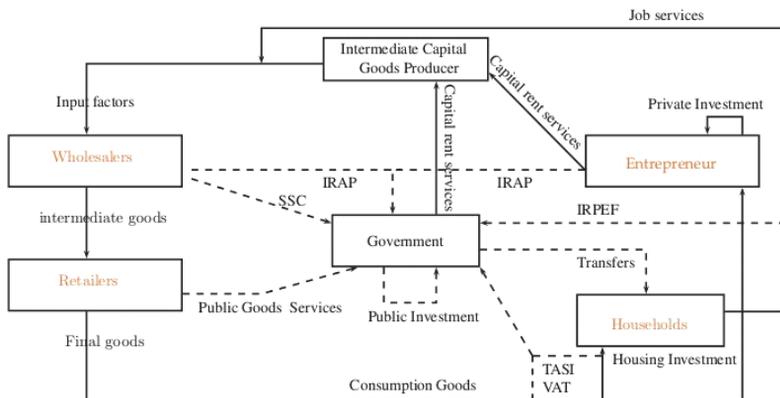
2.1. Households and firms

Households are divided into two groups: workers and entrepreneurs. The former rents job services and the latter rents capital goods to an intermediate firm sector. Both groups save and consume. Working households are further subdivided into impatient and patient or, respectively, negative and positive financial net savers.[11] Both consume non-durable and durable goods, invest in housing services, offer labour services to an intermediate sector and earn profits from the firm sectors. Patient households save and invest in housing and financial deposit services provided by the banking sector. Impatient households borrow from banks against their housing stock. Constrained households cannot finance their desired level of consumption and are more dependent on current

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10. Catalano and Pezzolla (2014) and Table A10 provide the results of alternative experiments without a balanced budget constraint.

11. The distinction between patient (unconstrained) and impatient (constrained) households allows us to account for the importance of financial factors in macroeconomic fluctuations. The presence of credit constrained agents and the "financial accelerator" may enhance the amplitude of business cycles depending on the source of the shocks. As Iacoviello (2005) states, the reasons for this choice are practical and substantial: "practical because, empirically, a large proportion of borrowing is secured by real estate; substantial because, although housing markets seem to play a role in business fluctuations, the channels by which they affect the economy are far from being understood".

income for consumption and, therefore, are more sensitive to a shock that affects their disposable income, even if the shock has no cyclical effect on their borrowing capacity. Similarly, entrepreneur households decide upon their capital investment goods and borrow from the banking sector.

An intermediate sector sells output to the monopolistic competitive retailer sector, which differentiates this output into multiple goods and sells them on final markets. The public sector levies taxes, buys public goods and provides unemployment and transfer payments to working households. Since working households and retailers are monopolistic competitive sectors, they set wages and prices respectively following a markup rule that creates a (double) wedge between final real wages and the marginal rate of substitution.[12] This allows us to explore labour and product market structural reforms through the reduction in wage and price markups.

2.2. Government

Government consumes an amount of domestic goods G_t at price P_t^{ch} and purchases capital investment goods ik_t^g at prices qk_t^g. Public capital evolves according to the following equation

$$K_t^g = ik_t^g + (1 - \delta^g)K_{t-1}^g, \tag{1}$$

where δ^g is a constant depreciation rate and ik_t^g is assumed to follow an exogenous process $ik_t^g = (1 - \rho_g)ik_{ss}^g + \rho_g\, ik_{t-1}^g + \varepsilon_t^k$, with ρ_g denoting the persistence parameter and ik_{ss}^g the steady-state value of public capital investment. Then, government rents capital services k_t^g to the intermediate capital goods firms at price Pk_t^g, gaining the following profits

$$\pi_t^g = Pk_t^g K_{t-1}^g - qk_t^g ik_t^g \tag{2}$$

which can be used to reduce government debt. Other government revenues are given by the exogenous tax rates imposed on labour, consumption, return on capital for entrepreneur households, SSC

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12. The working household sector has monopolistic power which allows it to earn a surplus share. However, this creates a friction, which allows us to account for a positive level of unemployment and an unemployment related Phillips-curve as in Galí (2011). This means that wage inflation is inversely affected by the unemployment gap, i.e. a positive deviation from its natural level. Therefore, wage stickiness (Calvo pricing) could affect the allocation of labour, increasing unemployment also in the short-run.

affecting wholesaler employer and real estate value and profits, i.e. τ_{irpef}, τ_{vat}, $\tau_{capital}$, τ_{ssc}, τ_{tasi} and τ_{irap}, respectively. Government borrows B_t from financial intermediaries at a rate R_t to finance its expenditure on G_t, which is adjusted in order to set the public deficit-to-GDP ratio to its long-run (target) level.[13] Public debt stock evolves according to the following equation:

$$
\begin{aligned}
B_t \quad &= 1 + R_{t-1}B_{t-1} + P_t^{ch}G_t + Pk_t^g K_{t-1}^g - qk_t^g ik_t^g - \tau_{capital,t}Pk_t K_{t-1} + \\
&\quad -\tau_{tasi,t}Pdv_{t,t}H_{t-1} - \tau_{irap,t}(Pw_t Y_t - Pk_t K_{t-1}) - \tau_{ssc,t}L_t W_t + \\
&\quad -\tau_{irpef,t}L_t W_t - \tau_{vat,t}\left(P_t C_t + Pch_t Cn_t + Pcd_t I_t^d\right) + \\
&\quad +T_t + U_t b,
\end{aligned}
\tag{3}
$$

where T_t denotes total transfers to unconstrained and constrained households.

Finally, the public expenditure reaction function is given by:

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\begin{aligned}
G_t \quad &:= 1 + R_{t-1}B_{t-1} + P_t^{ch}G_t + Pk_t^g K_{t-1}^g - qk_t^g ik_t^g - \tau_{capital,t}Pk_t K_{t-1} + \\
&\quad -\tau_{tasi,t}Pdv_{t,t}H_{t-1} - \tau_{irap,t}(Pw_t Y_t - Pk_t K_{t-1}) - \tau_{ssc,t}Ld_t W_t + \\
&\quad -\tau_{irpef,t}W_t L_t - \tau_{vat,t}\left(P_t C_t + Pch_t Cn_t + Pcd_t I_t^d\right) \\
&\quad +T_t + U_t b = 0.
\end{aligned}
\tag{4}
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where pk_t^g k_{t-1}^g are rent revenues on public capital stock, $qk_t^g ik_t^g$, investment costs, $\tau_{irap,t} Pk_t k_{t-1}$, taxation on capital, $\tau_{tasi,t} Pdv_{t,t}H_{t-1}$, taxation on housing, $\tau_{irap,t}(Pw_t Y_t - Pk_t K_{t-1})$, IRAP taxation on wholesaler profits, $\tau_{ssc,t}Ld_t W_t$, employee social contribution revenue, $\tau_{irpef,t} W_t L_t$, $\tau_{vat}(P_t C_t + Pch_t Cn_t + Pcd_t I_t^d)$, labour income and consumption taxation, T_t and $U_t b$ total transfers and unemployment benefits.

2.3. Taxes and tax payers

Taxes have different degrees of distortion that imply diverse efficiency gains from tax reforms, which need to be clarified. Distortionary taxes imply large effects on GDP in response to economic shocks, and the higher the distortion, the larger the effect.[14]

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13. In the scenario described in the following sections we interchange public spending with indirect taxations (VAT and TASI) or transfers.
14. Given that optimal taxation means distributing distortions over time in order to maximize welfare (Lucas and Stokey, 1983), a future research objective is a comprehensive analysis that explores the redistributive consequences of the revenue-neutral tax reforms we analyse in this paper.

2.4. Labour wedge components

IRPEF is the Italian individual income tax that is paid on several kinds of income earned both in Italy and abroad. In the model, we focus only on IRPEF levied on labour income that is paid by working households and affects their labour/leisure choice. This kind of taxation creates a wedge between the marginal rate of substitution and the real wage; thus, households require a higher wage to provide the same supply of labour that would be induced in the absence of this taxation. Therefore, a reduction in the IRPEF tax rate is expected to cause an increase in disposable income that will lead to higher consumption and saving, thereby stimulating the incentive to invest and to increase labour supply.

SSC are taxes paid by both workers and employers which are levied on the income received by the worker from the employer as a result of their employment relationship. In the model, SSC are defined as taxation on employed labour income levied only on the intermediate goods producers (employer). The higher the SSC rate, the higher the cost of labour for the employer. Therefore, a reduction in SSC is expected to induce an increase in demand for labour with positive effects on aggregate demand. It should be noted that this could trigger an adverse reallocation of capital investment as relative prices will change accordingly.

IRAP is the regional business tax levied on the value of production generated by business activities developed in Italian regions. In our model, it is paid by entrepreneur households that accumulate and rent physical capital, and by wholesalers that produce intermediate goods and services. IRAP can be considered a business tax on value added, which does not allow for deduction of labour costs. The IRAP tax base is computed by subtracting the cost of capital from the revenue from sales. Therefore, an IRAP tax rate increase would be particularly harmful to businesses making a loss rather than a profit (Manzo and Monteduro, 2011). Also, it affects demand for input factors: a reduction in the IRAP rate will induce a bias towards capital, while an increase in this rate will stimulate demand for labour.

2.5. Offsetting policies

To balance the budget and cover the revenue losses stemming from a cut in the labour tax wedge, we allow for different fiscal coverage: an increase in VAT rate; an increase in TASI; a reduction in government consumption; a decrease in public transfers. However, raising distorting taxation or reducing government consumption or transfers can offset some of the growth effects induced by a decrease in the labour tax wedge.[15] The channels through which this effect occurs may be different depending on the labour tax wedge component (IRPEF, SSC, IRAP) that is being reduced, and the fiscal coverage chosen to balance the budget.

VAT is a value added tax which, in Italy, is paid only by the final consumer; companies can generally deduct VAT paid in the intermediate production stages. VAT is levied on sales of goods and/or services within the Italian territory. In our model, VAT affects households' purchasing power relative to consumption of durable and non-durable goods, thereby conditioning households' consumption-leisure choices.

TASI is a tax on house services paid on real estate in Italy. In our model, TASI only affects owners, i.e. (patient and impatient) households, and their consumption-investment decisions. This effect is particularly noticeable for constrained households that have a high marginal propensity to consume. This implies a different consumption behaviour for impatient and patient households following fiscal shocks, especially when there is a tax shift from labour to property that discourages housing investment.[16]

A decrease in (unproductive) government consumption reduces the amount of resource government absorb from the economy and, given the large spending multiplier, almost completely offsets the positive effects of the labour tax wedge cut on GDP.

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15. It is worth noting that although a shift in tax from labour to consumption is often advocated to provide a work incentive and to increase supply and demand for labour, it also implies important distributive consequences that need to be taken into account. For instance, Pestel and Sommer (2013) find that people on low-incomes, and pensioners (who have a smaller income tax and social security contributions burden) are typically damaged by such a tax shift, with employees and unemployed workers being the main beneficiaries.

16. Following Carroll *et al.* (2014), in a future analysis, we could introduce different degrees of impatience across households with heterogeneous time preference rates, to account for inequality in the distribution of wealth.

Since we consider lump sum transfers, relative prices are not affected. Therefore, reducing transfers to households will affect aggregate demand, but to a lesser extent than government consumption, given that the fiscal burden implied by their reduction will be damaging to only a part of the economy, namely (patient and impatient) households. Transfers could be considered aggregated pensions and social income provided directly from the public sector to sustain aggregate demand. In particular, a reduction in transfers will mainly influence the decisions of constrained (impatient) households without free access to the credit market to finance their housing investment, whereas the consumption smoothing behaviour of unconstrained households will continue to sustain aggregate demand.

3. Calibration and experimental design

In this section we describe the calibration of the parameters of interest and the design of the experiment. All policy changes are assumed to be permanent. Also, we assume all measures are fully credible from the start, meaning that the announced reform path is believed to be immediately and fully anticipated.[17] The general calibration follows Catalano (2014) and Catalano and Pezzolla (2014). As we show below, we build several reform scenarios concerning both fiscal and structural policy areas. The public sector is calibrated to be at 40 per cent of GDP,[18] public expenditure on goods and services is set at 21 percent and public debt is 132 per cent in terms of the GDP ratio. We set marginal and mean tax rates for VAT, IRPEF, TASI and SSC at 14.5 per cent, 21 per cent, 0.8 per cent and 36 per cent respectively. Markup on the product market is set at 20 per cent, close to the values in Forni *et al.* (2010b).[19] Labour markup is equal to 20 per cent, setting the elasticity of substitution accordingly. We calibrate the price and wage

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17. For all shocks, the speed of reforms is set such that the time of convergence to the final value is 2 years. Thus, we assume a realistic process of institutional adaptation to fiscal and structural reforms.

18. The percentage includes transfers to households, unemployment benefits and expenditure of goods and services.

19. Based on the estimates in Christopoulou and Vermeulen (2012) for sectoral markups, we set the Italian price markup according to the aggregate value for Manufacturing and Construction, which is higher than the 18 per cent value estimated for the euro area.

markup reduction by 2 percentage points. This is consistent with the minimum size experiment performed in Forni *et al.* (2010b) on price markup.

3.1. Fiscal reform scenarios

To take account of the effects of a labour tax wedge cut we allow for a decrease in IRPEF, SSC and IRAP. For each fiscal instrument, we consider a tax cut such that the decrease in the relative fiscal revenue is equal to 1 per cent of nominal GDP. The simulation exercises are modelled such that the public budget is balanced and kept constant; therefore, in each experiment we allow for alternative fiscal adjustments/coverage: a reduction in public spending, a cut in public transfers, an increase in the VAT or TASI rate, against each labour tax wedge component simulated.[20] Also, in order to detect the likely payoffs stemming from a fiscal reform package, we analyse the effects of simultaneous cuts to IRPEF, IRAP and SSC.[21] Table 1 shows the percentage changes in tax rates.

3.2. Structural reform scenarios

Structural reforms aim at enhancing competition through short- and long-run increases in output, employment and investment. Rigidities in the product and labour markets imply that both prices and wages are higher than they would be in more competitive markets. This means that prices and wages may include a markup over marginal costs and over the marginal rate of substitution between consumption and leisure, respectively. Therefore, the simulation experiments take into account a 2 percentage point reduction in markups. Lower price markups would lead to an increase in competition and to a sizeable positive effect on GDP, and a lower wage markup would reduce union bargaining power and, hence, real wages, increasing flexibility in the labour market and generating a smaller, but not irrelevant increase in output. Similar to our treatment of fiscal reforms, we analyse the interactions between labour and product market reforms, combining them in a scenario with simultaneous markup changes.

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20. See section 2.5.
21. The size of the shock to each single tax rate is such that each instrument is simultaneously responsible for one-third of the total percentage change in GDP (1 percentage point).

Table 1. Fiscal reform scenarios

Experiments			
Fiscal reforms	**Tax rate**	**Single tax change**	**Simultaneous tax change**
Labour tax wedge cut	IRPEF	-2.7 pp	-0.9 pp
	SSC	-2.7 pp	-0.9 pp
	IRAP	-1.8 pp	-0.6 pp

3.3. Reform package scenario: combining fiscal and structural reforms

We consider a scenario that involves a broad simulation exercise that includes simultaneous tax wedge cuts and structural reforms. The purpose is to evaluate the interactions among policy measures and their likely dynamic tradeoffs.

4. Results

In this section we present the results of our scenarios for fiscal reforms aimed at reducing labour costs, and structural reforms to both labour and product markets in a budget-neutral scenario. These reforms may contribute to reducing the competitiveness gap with the best EU performers, and restoring the sustainability of public finances. We enrich the analysis by taking account also of the likely payoffs stemming from a combination of structural reforms to the labour and product markets, and evaluation of the macroeconomic implications of tax relief on labour associated with structural reforms. We collect all GDP multipliers in Table A1; in Tables A2 and A3 we show the response of the variables of interest to labour tax wedge and structural reforms respectively, for the given set of fiscal coverages.[22]

Fiscal reforms. In this section we describe the impact of a labour tax wedge cut via a decrease in IRPEF, SSC and IRAP tax rates. Regardless of the type of fiscal coverage,[23] we find a degree of dynamic tradeoff between the tax rates affecting labour costs: a reduction in social contributions produces the highest payoff in terms of real GDP in the short run, while a cut in IRAP produces

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22. In tables A2 and A3 the rows show the variables and the columns show the fiscal coverages that are transposed, as opposed to table A1.
23. See section 2.5.

the highest output in the long run. In this case, intermediate-goods producers and entrepreneur households have incentives to foster labour demand and employment but also investment in capital goods, whose effect *via* the capital accumulation process takes time. Given initial adverse effects on capital investment, a cut in IRAP seems to provide an initial cost in terms of GDP compared to the other tax wedge components (Table A1). A permanent decrease in the IRPEF tax rate causes an increase in disposable income that leads to a rise in consumption, investment and hence real GDP (Table A2). A cut in the SSC, which produces the highest short-run increase in output, like IRPEF, positively affects labour demand and disposable income, but also improves competitiveness and exports because the reduced labour costs allow a reduction in prices.

The best long-term performance is associated with a reduction in public transfers in order to offset the decrease in fiscal revenues from a reduction in each labour tax wedge component (Table A1, columns c1, c5, c9). This effect is due to the consumption smoothing behaviour of unconstrained households (and the relative low percentage of constrained households in the economy), which allows for a smaller reduction in aggregate demand given a contemporaneous increase in labour demand by firms. Thus, a public transfer performs better than other coverage in the long run, but VAT coverage represents the best compromise between the short- and long-run scenarios (Table A1, columns c3, c7, c11). Indeed, a tax shift from labour to consumption, results in an increase in disposable income, consumption – and the relative tax base – thus, offsetting the negative impact stemming from an increase in the VAT rate. The performance of the TASI is similarly to the VAT in the long run, but with some relevant costs in the short run in terms of real estate investment.[24] Increasing taxation will affect expected housing values, leading to a sharp decrease on impact in demand for housing investment.

In order to appreciate the impact of the fiscal reform package, we can consider a permanent reduction in the overall labour tax

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24. The huge impact of a TASI tax increase on GDP is due to the lack of adjustment cost that in the current version of the paper is not included into the model. If it was included the same impact would have been spread over several time periods.

wedge with simultaneous cuts in IRPEF, SSC and IRAP tax rates.[25] As expected, we observe a positive impact on labour demand and employment. In general, we find positive effects on GDP in the long-run, but public expenditure adjustment constrains the labour tax wedge cut effects (0.2 against 0.5 for TASI and VAT, and 0.9 for public transfer adjustment) via long run crowding-out of investment and consumption (see Table A1 columns c13-c16.).

Structural reforms. The purpose of product market reforms is to increase competition and stimulate growth, employment and productivity; labour market reforms aim mainly at increasing labour market flexibility and stimulating labour demand. We find that output increases especially under product market reforms, which perform better than labour market reforms in both the short and the long run (Table A1 c21-c24 vs c17-c20), irrespective of the type of fiscal coverage. However, only labour market reforms lead to a permanent contraction in the unemployment rate.[26] Our results show that a permanent reduction in price markups leads to an increase in exports and hence in domestic production and employment (Table A3). Labour market reforms imply a permanent reduction in the wage markup, which would lead to a fall in real wages and increased demand for labour. The reduction in prices resulting from labour market reforms, brought about by a decrease in marginal costs, is less intense compared to product market reforms, therefore, the positive effects on exports and consumption are more muted although not negligible, under labour market reforms.[27]

Thanks to structural reform payoffs, fiscal coverage adjustment to balance the budget works in the opposite direction to the labour tax wedge cut scenario: depending on the type of fiscal adjustment chosen the benefits stemming from structural reforms allow for either a reduction in the VAT and TASI rate (rather than an increase in the fiscal burden) or an increase in government

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25. See section 3.1 for details on the design of the experiment.
26. Our model incorporates the labor market as in Galí (2011). This explains unemployment in the long run as a frictional outcome due mainly to monopolistic labour union power. Therefore a reduction in labour wage mark-up allows to reduce supply and increase labour demand. When other shocks hit the economy the unemployment remains constant in the long run.
27. The small impact of labour market reforms is confirmed in the empirical literature (e.g., Barnes *et al.*, 2011; Bouis and Duval, 2011).

spending or transfers (rather than a reduction). This allows exploitation of the expansive side of public expenditure/transfers or of a cut in VAT or TASI. For both product and labour market reforms it is public spending that boosts the economy in the long run. In the short-run, the largest gains in terms of GDP come from product market reforms under a TASI fiscal coverage (Table A1, column c24). This effect depends on the price reduction, which, on the one side, reduces real estate values, but on the other side boosts the economy via a larger cut to housing taxation which enhances housing investment accumulation.

With respect to the public debt-to-GDP ratio, product market reforms perform better since they reduce the public debt-to-GDP ratio by about four times compared with labour market reforms (2.4 vs 0.7 percentage points in Table A3). Indeed, the reduction in prices would reduce the cost of final goods to consumers and yield higher real wages, which would cause a rise in disposable income in the long run. This would strengthen consumption and investment, which would increase more by around 2 percentage points (Table A3) under public spending and transfer coverage, and by around 6 percentage points under TASI coverage. Increased demand for goods would stimulate production and induce firms to employ more labour and capital. In the short run, labour demand increases more than labour supply (which grows because the income effect is dominated by the substitution effect stemming from the increased opportunity cost of leisure), thus, reducing the unemployment rate. Capital becomes relatively cheaper and firms increase capital investment. In the long run, output improves by around 2 percentage points with public spending coverage (Table A1 c22). Demand for capital also increases; thus, investments are permanently higher (by 1.5 per cent with TASI coverage, Table A3). Overall, real GDP improves in the short run and stabilises at the 0.5-0.6 per cent higher level in the long run.

Implementing simultaneous product and labour market reforms could imply some extra payoffs in both the short and long runs. The combination of structural reforms would prevent real wages from declining permanently, as they would do under labour market reforms only. If we combine labour and product market reforms, we can see that the effects of reforms are roughly additive (Table A1, c25-c28).

Combining structural and fiscal reforms. If we combine structural reforms with fiscal policies, product market reforms always perform better than labour market reforms (which constrains the expansion of aggregate demand via decreasing real wages). The labour tax wedge package, which includes simultaneous IRPEF, SSC and IRAP cuts (without structural reforms) points to transfer reduction as the best scenario in terms of GDP growth from the first quarter onwards (Table A1, column c13). The combination of contemporaneous IRPEF, SSC and IRAP cuts with structural reforms (Table A1, column c34) shows that, except for the first two quarters after the shock, it is always preferable to adjust public spending because its increase (due to the structural reform gains) provides benefits from higher multipliers than those from a reduction in taxation, while transfers interact poorly with structural reforms and, although positive, provide the worst coverage. As in the structural reform case, the interaction between structural and fiscal reforms are additive as shown in the results.[28]

5. Sensitivity analysis

Table A10 presents the results of fiscal and structural reforms in the case of an unbalanced budget which implies an endogenous adjustment to public debt. Note that, in this scenario, a labour tax wedge cut – IRPEF, SSC, IRAP – implies higher medium-run costs in terms of GDP, but higher gains in the long run compared to the balanced case. Conversely, structural reforms – LM and PM – in the presence of an unbalanced budget lead to higher short- and medium-run benefits, but lower gains in the long run. The same holds for an increase in government (productive) investment.[29] Unbalanced fiscal shocks partially affect the fiscal consolidation,

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28. In the model (see Catalano and Pezzolla, 2014) we have the unit labour cost (clup, VAT gross) defined as

$$clup = (1 + \tau_{vat})\frac{mrs}{mpl} = \frac{1}{markup_w markup_p}\frac{(1 - \tau_{irap})(1 - \tau_{irpef})}{1 + \tau_{ssc}}, \qquad (5)$$

where *mrs* is the marginal rate of substitution, *mpl* is the marginal labour productivity and *markup_w markup_p* are respectively wage and price mark-ups. The right hand side of the equation is the labor tax wedge. It is straightforward that first order effects of simultaneous structural and fiscal reforms are additive.
29. For further details on the effects of a government investment increase see section 6.

while in the balanced case, where the initial deficit is kept constant, consequent fiscal room is used to increase public goods demand.

In the remaining part of this section we assess the sensitivity of the baseline results to the following specifications (robustness checks): *a)* different degree of nominal price and wage rigidity;[30] *b)* higher percentage of liquidity-constrained households;[31] *c)* tightening of credit conditions.[32] We distinguish the most significant effects through calibration frameworks, comparing them with baseline.

With respect to specification a), we analyse the effect of the shocks in the presence of lower price rigidity compared to the baseline. Price rigidity implies that prices do not adjust either continuously or fully to changes in demand or costs. This means that the probability of prices changing is not constant, and not all firms can adjust to the optimal price immediately. The proportion of prices not resetting is a measure of nominal rigidity. Because firms set prices as a markup over a weighted average of expected future marginal costs, the announcement of a labour tax wedge cut in the presence of lower price rigidity would imply a higher output response in the short run, given the increased proportion of reoptimising firms. The more sensitive variables to lower price rigidity are labour demand, capital investment and production. The effects on short-run GDP are larger for SSC and IRAP cuts under TASI fiscal coverage (Table A4, c8 and c12 Year 1). Therefore, a reduction in the unit cost of labour (*via* a reduction in SSC or IRAP) leads to a higher response of output as the price adjustment spreads over the final markets and allows for higher aggregate demand in the short run. Surprisingly, a lower nominal price rigidity decreases the output response to a price markup shock since a reduction in wholesaler profits induced by a faster real cost increase leads to lower demand in the labour and capital markets. When rigidity enters the wage determination mechanism (Table A5), imperfect adjustments to employment and the real wage can affect the short-

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30. We change the values of parameters ζ_p and χ_w in the model to 0.7 from 0.8 and 0.5 respectively, see Catalano (2014).

31. We change the value of parameter μ_a from 20 to 40 per cent, see Catalano and Pezzolla (2014).

32. We change the values of parameters μ_μ and μ_2 from 0.3 and 0.1 to 0.1 and 0.033; see Catalano (2014) and Catalano and Pezzolla (2014).

run response of the economy to a macroeconomic shock: if labour costs decrease due to a smaller labour wedge, the boost in labour demand will lead to a lower wage in the short run. Due to higher nominal rigidity, unions decrease wages slowly, maintaining higher available income. Regarding structural reforms, the increase in real wages due to a faster price markup reduction allows for higher demand and boosts growth. In the face of a positive shock induced by structural reforms to the labour markets, if wage rigidity is higher than the baseline, the employment adjustment will be slower.

Specification b) allows for a higher number of impatient households in the economy. The higher the percentage of constrained households, the more sensitive the economy to income shocks. If there is a positive shock increasing house prices (e.g., generated by a shock to the marginal rate of substitution between housing and consumption for all households), debtor borrowing capacity increases, allowing households to spend more and invest more. Therefore, the net effect on demand is positive, and acts as a powerful amplification mechanism. However, a higher proportion of impatient households does not seem to affect the labour wedge cost. Structural reforms interact with a higher financial constraint on the household sector, in particular in the case of product market reform (Table A6). In the short run, transfers and public spending seem to respond quickly due to lower availability of income and consequently lower aggregate demand. A reduction in prices leads to devaluation of housing stock and, therefore, also borrowing capacity. In the case of transfers and public spending (Table A6, c21 c22), the negative effects are larger because of lower available income for constrained households, which causes a decrease in aggregate demand and output.

Specification c) is obtained via lower loan-to-value (LTV) ratios for both households and entrepreneurs. Their demand for loans is more sensitive to income and net worth shocks in countries with higher LTV ratios, given the collateral-based financial accelerator mechanism.[33] A positive shock boosting household demand for housing, or firm demand for capital investment, would lead to an increase in households' borrowing capacity. Clearly, the higher the

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33. See Catalano (2014) and Catalano and Pezzolla (2014).

LTV ratio the higher the increase in their borrowing capacity. On the other hand, lower LTV ratios render the collateral constraint more binding and reduce the impact of (positive or negative) shocks to household income. Tables A7 and A8 show that lower LTV ratios induce a slight reduction in the short-run output response to fiscal and structural changes. In particular, a higher financial constraint on working households seems to affect structural reforms covered by public transfers since lower available income reduces aggregate demand, thus, decreasing the impact of structural reforms on the labour market (Table A7 c17). Finally, structural reforms on the labour market implemented during a financial recession particularly affecting the entrepreneur sector, could slightly decrease the positive effects on GDP with respect to the baseline case (Table A8 c17-c28) except for the case of product market reforms that have a positive impact.

6. Government investment

All the experiments described in the previous sections are based on an economy with constant public capital stock, while the private sector accumulates capital given economic market incentives. In this section we investigate what would happen if the policymaker expands the productive capacity of the economy in the long run, by increasing public investment. We assess the interactions between the increase in public investment and the abovementioned fiscal and structural reforms. We expect a greater benefit to the economy in the long run, at the cost of lower growth in the short term. In fact, the simulations indicate that the positive effect of a wedge cut is enhanced in the presence of a permanent increase in public investment equal to 1 per cent of GDP: this alone has an effect similar to the effect of structural reform to the product market (Table A9). The full package of reforms in the presence of increased public investment shows a strong interaction with adjustment to public spending to balance the budget: the cumulative effect on GDP increases by more than 2 percentage points compared to the full package of reforms in the baseline case (Table A9 c2, c6-. . . -c30, c34). Although at the expense of a slight initial cost due to a tightening of budget coverage, an increase in public investment would ensure higher long-run growth and lead

to an increased chance of spending or increased chance of a reduction in the tax burden on indirect taxes.

7. Conclusions

Reduction in the labour tax wedge and implementation of structural reforms are two crucial instruments for boosting growth and achieving long-run fiscal consolidation goals. In this paper we analyse the effects of both structural reforms, *via* a reduction in prices and wage markups, and a labour tax wedge cut *via* a reduction to the IRPEF and IRAP and SSC tax rates. Our findings indicate that a cut in IRAP is the best tax wedge component to stimulate long-run GDP growth. In all the experiments we propose, the decrease in fiscal revenues coming from the tax wedge cut was offset by the use of different fiscal instruments, namely, a public spending cut, a reduction in public transfers and a shift from a labour to a consumption or property tax rate. We found that in the absence of structural reforms, the reduction in public transfers to households to cover a labour wedge cut is the best instrument to ensure higher GDP growth under the balanced budget constraint. Conversely, in the presence of both a labour tax wedge cut and structural reforms in the product market, the best instrument is public spending, which allows exploitation of the positive effects of simultaneous fiscal and structural reforms. We provide some additional robustness checks regarding the degree of nominal rigidity in the economy and the availability of credit to economic agents with the aim of showing how fiscal policy might be affected by contemporaneous financial distress. There is evidence of a negative impact from the interaction of fiscal reform to the labour wedge with transfers, and aggregate demand. We also consider the role of increasing public investment in order to measure the interaction mechanism between fiscal policy instruments and growing capital stock due to an expansionary public policy. Except for an initial cost in terms of growth, public investment causes widespread improvements to GDP growth, enhancing the positive effects from increased public expenditure on goods and services. The picture that emerges from these various model specifications indicates that the baseline results are fairly robust to changes in the parameters considered and the economic conditions. The simulation exercises show that structural reforms could provide large

payoffs in terms of growth and employment. In particular public spending is shown to be a useful instrument if used in combination with product market reforms. Among the other options, we recommend stimulating public investment, because this could magnify the effects of structural reforms in Italy. Finally, in order to alleviate the short-run costs of a public investment increase, it could be useful to simultaneously reduce the labour tax wedge components.

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APPENDIX

Table A1. Fiscal and structural reforms
(GDP percentage deviation from steady state, Baseline)

Reform	Coverage	Δ LP	1st year				3rd year	5th year	10th year	20th year	Column
			IQ	IIQ	IIIQ	IVQ	IQ	IQ	IQ	IQ	
IRPEF	Pub. Transf.	-	0.24	0.37	0.43	0.48	0.72	0.83	0.91	0.97	c1
	Pub. Spend.	-	0.34	-0.09	-0.18	-0.17	-0.03	0.10	0.12	0.15	c2
	VAT	+	0.64	0.33	0.27	0.26	0.32	0.40	0.44	0.47	c3
	TASI	+	-1.74	-0.83	-0.48	-0.29	0.24	0.32	0.41	0.46	c4
SSC	Pub. Transf.	-	0.32	0.50	0.56	0.58	0.58	0.54	0.60	0.63	c5
	Pub. Spend.	-	0.25	0.17	0.20	0.22	0.17	0.07	0.08	0.09	c6
	VAT	+	0.45	0.39	0.40	0.41	0.32	0.23	0.26	0.27	c7
	TASI	+	-0.51	-0.05	0.11	0.17	0.25	0.18	0.24	0.27	c8
IRAP	Pub. Transf.	-	0.08	0.34	0.42	0.47	0.64	0.75	0.96	1.11	c9
	Pub. Spend.	-	-0.12	-0.14	-0.09	-0.04	0.08	0.15	0.36	0.53	c10
	VAT	+	0.30	0.20	0.22	0.26	0.33	0.40	0.59	0.74	c11
	TASI	+	-1.42	-0.53	-0.21	-0.09	0.26	0.34	0.57	0.73	c12
IRPEF+SSC + IRAP	Pub. Transf.	-	0.21	0.41	0.46	0.51	0.64	0.70	0.81	0.89	c13
	Pub. Spend.	-	0.16	-0.01	-0.02	0.00	0.07	0.11	0.18	0.24	c14
	VAT	+	0.46	0.31	0.30	0.31	0.32	0.34	0.42	0.48	c15
	TASI	+	-1.20	-0.46	-0.19	-0.08	0.25	0.28	0.40	0.48	c16
LM	Pub. Transf.	+	0.14	0.26	0.28	0.31	0.43	0.49	0.53	0.57	c17
	Pub. Spend.	+	0.12	0.13	0.17	0.22	0.40	0.49	0.56	0.61	c18
	VAT	-	0.06	0.08	0.12	0.17	0.34	0.42	0.47	0.50	c19
	TASI	-	0.31	0.26	0.26	0.29	0.40	0.44	0.47	0.51	c20
PM	Pub. Transf.	+	0.77	1.49	1.61	1.54	1.19	1.03	1.24	1.37	c21
	Pub. Spend.	+	0.91	2.53	2.74	2.58	1.86	1.57	1.88	2.12	c22
	VAT	-	0.08	1.36	1.64	1.66	1.41	1.19	1.47	1.67	c23
	TASI	-	4.56	3.25	2.65	2.29	1.33	1.33	1.54	1.69	c24
LM+PM	Pub. Transf.	+	0.88	1.62	1.76	1.73	1.49	1.37	1.61	1.77	c25
	Pub. Spend.	+	1.03	2.67	2.93	2.82	2.29	2.07	2.45	2.74	c26
	VAT	-	0.14	1.45	1.77	1.84	1.77	1.62	1.95	2.18	c27
	TASI	-	4.90	3.53	2.95	2.61	1.75	1.78	2.03	2.21	c28
IRPEF+SSC + IRAP+LM	Pub. Transf.	+	0.32	0.52	0.60	0.68	0.93	1.04	1.18	1.29	c29
	Pub. Spend.	+	0.27	0.12	0.15	0.22	0.48	0.59	0.74	0.85	c30
	VAT	-	0.52	0.39	0.42	0.47	0.66	0.76	0.89	0.99	c31
	TASI	-	-0.88	-0.20	0.08	0.22	0.65	0.72	0.88	0.98	c32
IRPEF+SSC +IRAP+LM +PM	Pub. Transf.	+	1.07	1.89	2.10	2.11	2.01	1.93	2.27	2.50	c33
	Pub. Spend.	+	1.19	2.66	2.90	2.82	2.35	2.16	2.62	2.97	c34
	VAT	-	0.61	1.77	2.08	2.16	2.09	1.96	2.37	2.66	c35
	TASI	-	3.70	3.07	2.76	2.53	1.99	2.05	2.43	2.68	c36

Note: The values indicate GDP percentage changes after fiscal and/or structural reforms. Labour tax wedge includes IRPEF (labour income tax), SSC (social security contributions paid only by employers), and IRAP (regional tax on productive activities). LM: labour market reform (reduction in wage markup); PM: product market reform (reduction in price markup); LM+PM simultaneous labour and product market reform. All experiments assume a balanced budget scenario. Fiscal coverages to balance the budget, after any shock, include: public spending or transfer adjustment; VAT or TASI (house services tax) adjustment. ΔLP: long-run fiscal coverage change.

Table A2. Impact of a labour tax wedge cut
(deviation from steady state)

Variable	Year (IQ)	Public Spending			VAT			TASI			Public Transfers		
		IRPEF	SSC	IRAP	IRPEF	SSC	IRAP	IRPEF	SSC	IRAP	IRPEF	SSC	IRAP
Output	1	0.34	0.25	-0.12	0.64	0.45	0.30	-1.74	-0.51	-1.42	0.24	0.32	0.08
	3	-0.03	0.17	0.08	0.32	0.32	0.33	0.24	0.25	0.26	0.72	0.58	0.64
	5	0.10	0.07	0.15	0.40	0.23	0.40	0.32	0.18	0.34	0.83	0.54	0.75
	10	0.12	0.08	0.36	0.44	0.26	0.59	0.41	0.24	0.57	0.91	0.60	0.96
	20	0.15	0.09	0.53	0.47	0.27	0.74	0.46	0.27	0.73	0.97	0.63	1.11
Consumption	1	0.27	0.19	0.10	0.31	0.15	-0.04	0.22	0.17	0.06	0.01	0.02	-0.11
	3	1.20	0.77	0.61	0.04	0.27	-0.18	1.16	0.78	0.58	0.49	0.36	0.06
	5	1.26	0.75	0.76	0.24	0.18	0.01	1.21	0.75	0.71	0.65	0.36	0.28
	10	1.30	0.76	1.03	0.35	0.20	0.40	1.32	0.77	1.04	0.84	0.45	0.70
	20	1.34	0.77	1.26	0.41	0.24	0.72	1.42	0.82	1.32	0.97	0.53	1.03
Investment	1	2.26	1.57	1.09	2.85	1.90	1.79	-10.97	-3.81	-8.72	0.26	0.33	-0.43
	3	1.05	0.79	2.10	1.46	0.94	2.38	-1.92	-0.91	-0.01	1.15	0.88	2.17
	5	1.09	0.58	1.89	1.38	0.74	2.12	-1.84	-1.16	-0.21	1.22	0.66	1.99
	10	1.05	0.60	1.72	1.30	0.74	1.90	-1.79	-1.03	-0.11	1.09	0.63	1.76
	20	1.03	0.59	1.57	1.25	0.72	1.70	-1.80	-1.03	-0.14	1.01	0.58	1.56
Employment	1	0.55	0.42	-0.17	0.99	0.72	0.48	-2.69	-0.76	-2.18	0.38	0.51	0.15
	3	0.17	0.39	0.14	0.52	0.55	0.38	0.64	0.54	0.47	1.15	0.93	0.88
	5	0.36	0.20	0.05	0.62	0.35	0.26	0.73	0.39	0.35	1.25	0.78	0.77
	10	0.35	0.21	0.05	0.60	0.35	0.22	0.73	0.42	0.32	1.20	0.76	0.68
	20	0.35	0.21	0.04	0.59	0.34	0.18	0.71	0.41	0.26	1.16	0.74	0.60
Unemployment	1	-0.28	-0.65	-0.10	-0.54	-0.84	-0.56	2.51	0.38	1.67	0.33	-0.42	0.03
	3	0.13	-0.34	-0.23	0.12	-0.33	-0.22	0.01	-0.37	-0.29	0.14	-0.31	-0.19
	5	-0.02	-0.01	-0.02	-0.01	0.00	-0.01	0.00	0.00	0.00	-0.01	-0.01	-0.01
	10	-0.01	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	20	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Debt/GDP	1	-0.39	-0.28	0.17	-0.76	-0.52	-0.34	2.11	0.64	1.74	-0.29	-0.36	-0.09
	3	0.21	-0.10	0.05	-0.30	-0.33	-0.31	-0.12	-0.18	-0.18	-0.76	-0.62	-0.68
	5	0.07	0.02	-0.04	-0.40	-0.23	-0.40	-0.20	-0.12	-0.26	-0.87	-0.59	-0.79
	10	0.04	0.01	-0.27	-0.44	-0.26	-0.61	-0.30	-0.18	-0.53	-0.96	-0.65	-1.03
	20	0.01	0.00	-0.47	-0.48	-0.28	-0.78	-0.36	-0.21	-0.71	-1.03	-0.69	-1.20

Note: The values indicate percentage changes after fiscal reforms. Labour tax wedge includes IRPEF (labour income tax), SSC (social security contributions paid only by employers), and IRAP (regional tax on productive activities). All experiments assume a balanced budget scenario. Fiscal coverages to balance the budget, after any shock, include: public spending or transfer adjustment; VAT or TASI (house services tax) adjustment. ΔLP: long-run fiscal coverage change.

Table A3. Impact of structural reforms
(deviation from steady state)

Variable	Year (IQ)	Public Spending			VAT			TASI			Public Transfers		
		LM	PM	LM+PM	LM	PM	LM+PM	LM	PM	LM+PM	LM	PM	LM+PM
Output	1	0.12	0.91	1.03	0.06	0.08	0.14	0.31	4.56	4.90	0.14	0.77	0.88
	3	0.40	1.86	2.29	0.34	1.41	1.77	0.40	1.33	1.75	0.43	1.19	1.49
	5	0.49	1.57	2.07	0.42	1.19	1.62	0.44	1.33	1.78	0.49	1.03	1.37
	10	0.56	1.88	2.45	0.47	1.47	1.95	0.47	1.54	2.03	0.53	1.24	1.61
	20	0.61	2.12	2.74	0.50	1.67	2.18	0.51	1.69	2.21	0.57	1.37	1.77
Consumption	1	0.03	-0.11	-0.09	0.06	-0.05	0.00	0.01	0.00	0.03	-0.04	0.05	0.11
	3	0.18	-0.02	0.17	0.41	1.55	1.99	0.16	0.15	0.32	0.17	0.58	0.91
	5	0.25	0.29	0.54	0.55	1.34	1.90	0.24	0.35	0.60	0.26	0.71	1.10
	10	0.34	0.71	1.05	0.66	1.93	2.60	0.33	0.67	1.01	0.37	1.08	1.54
	20	0.42	1.03	1.45	0.74	2.35	3.11	0.39	0.93	1.33	0.44	1.37	1.89
Investment	1	0.28	1.66	1.96	0.20	-0.10	0.11	1.85	26.31	28.23	-0.22	2.31	2.84
	3	0.60	3.62	4.27	0.54	3.08	3.65	1.57	6.11	7.76	0.58	3.68	4.27
	5	0.62	2.46	3.09	0.54	2.19	2.74	1.55	5.91	7.50	0.61	2.28	2.87
	10	0.55	2.15	2.72	0.47	1.86	2.35	1.48	6.04	7.57	0.55	2.10	2.64
	20	0.50	1.93	2.44	0.42	1.60	2.03	1.48	6.01	7.54	0.50	1.92	2.43
Employment	1	0.18	1.53	1.72	0.10	0.27	0.37	0.49	7.21	7.73	0.22	1.32	1.51
	3	0.64	2.28	2.96	0.56	1.92	2.51	0.61	1.43	2.07	0.66	1.46	1.96
	5	0.72	1.45	2.18	0.65	1.18	1.84	0.64	1.05	1.70	0.71	0.81	1.34
	10	0.71	1.46	2.18	0.63	1.16	1.80	0.60	1.02	1.64	0.68	0.78	1.29
	20	0.71	1.45	2.16	0.63	1.11	1.74	0.59	0.96	1.57	0.66	0.71	1.20
Unemployment	1	-0.27	-0.89	-1.16	-0.21	-0.01	-0.23	-0.51	-5.88	-6.45	-0.17	-1.01	-1.34
	3	-0.97	-0.37	-1.37	-0.96	-0.38	-1.38	-0.96	-0.15	-1.14	-0.96	-0.41	-1.43
	5	-1.05	0.04	-1.01	-1.05	0.05	-0.99	-1.05	0.03	-1.01	-1.05	0.06	-0.99
	10	-1.05	-0.01	-1.06	-1.04	0.00	-1.05	-1.04	0.00	-1.05	-1.04	0.00	-1.05
	20	-1.05	-0.01	-1.05	-1.04	0.00	-1.04	-1.04	0.00	-1.04	-1.04	0.00	-1.04
Debt/GDP	1	-0.13	-0.97	-1.11	-0.07	0.04	-0.03	-0.38	-5.33	-5.71	-0.17	-0.79	-0.92
	3	-0.44	-2.06	-2.52	-0.34	-1.43	-1.78	-0.43	-1.42	-1.86	-0.47	-1.24	-1.53
	5	-0.53	-1.76	-2.29	-0.42	-1.21	-1.63	-0.48	-1.50	-1.97	-0.53	-1.10	-1.43
	10	-0.61	-2.12	-2.72	-0.48	-1.52	-1.99	-0.52	-1.74	-2.26	-0.58	-1.32	-1.69
	20	-0.68	-2.39	-3.05	-0.52	-1.73	-2.24	-0.56	-1.90	-2.46	-0.62	-1.47	-1.87

Note: The values indicate percentage changes after structural reforms. LM: labour market reform (reduction in wage markup); PM: product market reform (reduction in price markup); LM+PM simultaneous labour and product market reform. All experiments assume a balanced budget scenario. Fiscal coverages to balance the budget, after any shock, include: public spending or transfer adjustment; VAT or TASI (house services tax) adjustment. ΔLP: long-run fiscal coverage change.

Table A4. Fiscal and structural reforms with a lower price rigidity
(GDP percentage deviation from baseline)

Reform	Coverage	Δ LP	1st year				3rd year	5th year	10th year	20th year	Column
			IQ	IIQ	IIIQ	IVQ	IQ	IQ	IQ	IQ	
IRPEF	Pub. Transf.	-	-0.01	-0.01	0.01	0.02	0.03	0.01	0.00	0.00	c1
	Pub. Spend.	-	-0.13	0.08	0.14	0.15	0.08	0.01	0.01	0.00	c2
	VAT	+	-0.15	-0.05	-0.01	0.01	0.03	0.00	0.00	0.00	c3
	TASI	+	0.53	0.29	0.19	0.14	0.02	0.02	0.01	0.00	c4
SSC	Pub. Transf.	-	0.09	0.13	0.13	0.11	0.03	0.01	0.01	0.00	c5
	Pub. Spend.	-	0.15	0.30	0.28	0.22	0.05	0.02	0.01	0.00	c6
	VAT	+	0.03	0.15	0.16	0.13	0.03	0.00	0.00	0.00	c7
	TASI	+	0.53	0.33	0.23	0.17	0.01	0.02	0.01	0.00	c8
IRAP	Pub. Transf.	-	0.09	0.11	0.10	0.09	0.03	0.01	0.01	0.00	c9
	Pub. Spend.	-	0.19	0.30	0.28	0.23	0.07	0.03	0.01	0.00	c10
	VAT	+	0.01	0.13	0.13	0.11	0.03	0.01	0.00	0.00	c11
	TASI	+	0.63	0.36	0.24	0.17	0.01	0.02	0.01	0.00	c12
IRPEF+SSC + IRAP	Pub. Transf.	-	0.05	0.07	0.08	0.07	0.03	0.01	0.00	0.00	c13
	Pub. Spend.	-	0.06	0.22	0.23	0.20	0.07	0.02	0.01	0.00	c14
	VAT	+	-0.03	0.07	0.09	0.08	0.03	0.00	0.00	0.00	c15
	TASI	+	0.55	0.32	0.21	0.16	0.01	0.02	0.01	0.00	c16
LM	Pub. Transf.	+	-0.13	-0.42	-0.52	-0.50	-0.27	-0.06	-0.04	-0.01	c17
	Pub. Spend.	+	-0.02	0.01	0.02	0.03	0.02	0.00	0.00	0.00	c18
	VAT	-	-0.01	0.01	0.03	0.03	0.02	0.00	0.00	0.00	c19
	TASI	-	-0.04	-0.01	0.00	0.01	0.01	0.00	0.00	0.00	c20
PM	Pub. Transf.	+	0.07	0.04	0.04	0.05	0.04	0.01	0.01	0.00	c21
	Pub. Spend.	+	-0.12	-1.07	-1.21	-1.10	-0.46	-0.12	-0.07	-0.02	c22
	VAT	-	0.22	-0.42	-0.58	-0.60	-0.34	-0.06	-0.03	-0.01	c23
	TASI	-	-2.06	-1.33	-1.00	-0.79	-0.18	-0.09	-0.06	-0.02	c24
LM+PM	Pub. Transf.	+	-0.14	-0.43	-0.51	-0.49	-0.26	-0.06	-0.04	-0.01	c25
	Pub. Spend.	+	-0.14	-1.06	-1.20	-1.08	-0.45	-0.12	-0.07	-0.02	c26
	VAT	-	0.20	-0.40	-0.56	-0.58	-0.32	-0.05	-0.03	-0.01	c27
	TASI	-	-2.11	-1.35	-1.00	-0.79	-0.17	-0.09	-0.06	-0.01	c28
IRPEF+SSC + IRAP+LM	Pub. Transf.	+	0.05	0.07	0.09	0.09	0.04	0.01	0.01	0.00	c29
	Pub. Spend.	+	0.04	0.23	0.25	0.23	0.09	0.02	0.01	0.00	c30
	VAT	-	-0.05	0.09	0.12	0.11	0.05	0.01	0.01	0.00	c31
	TASI	-	0.51	0.31	0.22	0.17	0.03	0.02	0.01	0.00	c32
IRPEF+SSC +IRAP+LM +PM	Pub. Transf.	+	-0.09	-0.34	-0.42	-0.41	-0.23	-0.05	-0.03	-0.01	c33
	Pub. Spend.	+	-0.08	-0.84	-0.96	-0.87	-0.38	-0.09	-0.06	-0.02	c34
	VAT	-	0.17	-0.33	-0.47	-0.49	-0.29	-0.05	-0.03	-0.01	c35
	TASI	-	-1.55	-1.02	-0.78	-0.62	-0.16	-0.07	-0.05	-0.01	c36

Note: The values indicate GDP percentage deviations from the baseline in Table A1 after fiscal and/or structural reforms. Labour tax wedge includes IRPEF (labour income tax), SSC (social security contributions paid only by employers), and IRAP (regional tax on productive activities). LM: labour market reform (reduction in wage markup); PM: product market reform (reduction in price markup); LM+PM simultaneous labour and product market reform. All experiments assume a balanced budget scenario. Fiscal coverages to balance the budget, after any shock, include: public spending or transfer adjustment; VAT or TASI (house services tax) adjustment. ΔLP: long-run fiscal coverage change.

**Table A5. Fiscal and structural reforms with a higher wage rigidity
(GDP percentage deviation from baseline)**

Reform	Coverage	Δ LP	1st year				3rd year	5th year	10th year	20th year	Column
			IQ	IIQ	IIIQ	IVQ	IQ	IQ	IQ	IQ	
IRPEF	Pub. Transf.	-	-0.04	-0.05	-0.07	-0.08	-0.09	-0.02	0.00	0.00	c1
	Pub. Spend.	-	-0.02	-0.05	-0.08	-0.10	-0.11	-0.02	0.00	0.00	c2
	VAT	+	0.00	-0.02	-0.03	-0.05	-0.06	-0.01	0.00	0.00	c3
	TASI	+	-0.20	-0.17	-0.17	-0.16	-0.09	-0.02	0.00	0.00	c4
SSC	Pub. Transf.	-	0.07	0.10	0.13	0.16	0.19	0.06	0.01	0.00	c5
	Pub. Spend.	-	0.06	0.11	0.17	0.21	0.29	0.11	0.02	0.01	c6
	VAT	+	0.04	0.09	0.14	0.18	0.25	0.09	0.01	0.00	c7
	TASI	+	0.29	0.24	0.25	0.27	0.24	0.07	0.01	0.00	c8
IRAP	Pub. Transf.	-	0.04	0.05	0.07	0.09	0.11	0.04	0.01	0.00	c9
	Pub. Spend.	-	0.04	0.06	0.09	0.11	0.18	0.08	0.02	0.01	c10
	VAT	+	0.02	0.06	0.09	0.11	0.16	0.06	0.01	0.00	c11
	TASI	+	0.13	0.11	0.12	0.14	0.14	0.05	0.01	0.00	c12
IRPEF+SSC +IRAP	Pub. Transf.	-	0.02	0.03	0.04	0.05	0.07	0.03	0.01	0.00	c13
	Pub. Spend.	-	0.03	0.04	0.06	0.07	0.12	0.06	0.01	0.00	c14
	VAT	+	0.02	0.04	0.06	0.08	0.11	0.04	0.01	0.00	c15
	TASI	+	0.07	0.06	0.07	0.08	0.09	0.03	0.01	0.00	c16
LM	Pub. Transf.	+	0.12	0.20	0.26	0.31	0.29	0.04	0.01	0.00	c17
	Pub. Spend.	+	-0.01	-0.03	-0.05	-0.06	-0.07	-0.02	0.00	0.00	c18
	VAT	-	-0.01	-0.03	-0.04	-0.05	-0.06	-0.01	0.00	0.00	c19
	TASI	-	-0.07	-0.06	-0.06	-0.07	-0.05	-0.01	0.00	0.00	c20
PM	Pub. Transf.	+	-0.01	0.00	0.01	0.01	0.03	0.03	0.02	0.00	c21
	Pub. Spend.	+	0.08	0.24	0.37	0.46	0.42	0.06	0.03	0.01	c22
	VAT	-	0.04	0.14	0.22	0.28	0.29	0.03	0.01	0.00	c23
	TASI	-	0.64	0.57	0.56	0.55	0.32	0.04	0.02	0.01	c24
LM+PM	Pub. Transf.	+	0.10	0.17	0.23	0.27	0.25	0.04	0.01	0.00	c25
	Pub. Spend.	+	0.07	0.21	0.32	0.40	0.36	0.05	0.03	0.01	c26
	VAT	-	0.03	0.11	0.18	0.23	0.24	0.03	0.01	0.00	c27
	TASI	-	0.57	0.52	0.51	0.49	0.28	0.04	0.02	0.01	c28
IRPEF+SSC + IRAP+LM	Pub. Transf.	+	0.01	0.01	0.01	0.01	0.03	0.02	0.01	0.00	c29
	Pub. Spend.	+	0.01	0.01	0.01	0.01	0.05	0.04	0.01	0.00	c30
	VAT	-	0.01	0.02	0.02	0.03	0.06	0.03	0.01	0.00	c31
	TASI	-	0.00	0.00	0.01	0.02	0.04	0.03	0.01	0.00	c32
IRPEF+SSC +IRAP+LM +PM	Pub. Transf.	+	0.13	0.21	0.28	0.33	0.33	0.07	0.02	0.01	c33
	Pub. Spend.	+	0.10	0.25	0.38	0.47	0.49	0.11	0.04	0.01	c34
	VAT	-	0.05	0.16	0.25	0.32	0.36	0.08	0.02	0.01	c35
	TASI	-	0.65	0.58	0.58	0.57	0.38	0.07	0.03	0.01	c36

Note: The values indicate GDP percentage deviations from the baseline in Table A1 after fiscal and/or structural reforms. Labour tax wedge includes IRPEF (labour income tax), SSC (social security contributions paid only by employers), and IRAP (regional tax on productive activities). LM: labour market reform (reduction in wage markup); PM: product market reform (reduction in price markup); LM+PM simultaneous labour and product market reform. All experiments assume a balanced budget scenario. Fiscal coverages to balance the budget, after any shock, include: public spending or transfer adjustment; VAT or TASI (house services tax) adjustment. ΔLP: long-run fiscal coverage change.

**Table A6. Fiscal and structural reforms with a higher percentage
of constrained households (marginal GDP percentage deviation from baseline)**

Reform	Coverage	Δ LP	1st year				3rd year	5th year	10th year	20th year	Column
			IQ	IIQ	IIIQ	IVQ	IQ	IQ	IQ	IQ	
IRPEF	Pub. Transf.	-	-0.02	-0.01	0.00	0.00	-0.01	-0.01	-0.01	-0.01	c1
	Pub. Spend.	-	-0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	c2
	VAT	+	-0.02	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	c3
	TASI	+	-0.05	-0.02	-0.01	-0.01	0.00	0.00	0.00	0.00	c4
SSC	Pub. Transf.	-	0.02	0.01	0.00	0.00	-0.01	-0.01	-0.01	-0.01	c5
	Pub. Spend.	-	0.04	0.06	0.03	0.02	-0.01	0.00	0.00	0.00	c6
	VAT	+	0.02	0.03	0.02	0.01	0.00	0.00	0.00	0.00	c7
	TASI	+	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	c8
IRAP	Pub. Transf.	-	0.01	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.01	c9
	Pub. Spend.	-	0.01	0.02	0.02	0.01	0.00	0.00	0.00	0.00	c10
	VAT	+	-0.02	-0.02	-0.01	0.00	0.00	0.00	0.00	0.00	c11
	TASI	+	-0.06	-0.03	-0.01	-0.01	0.00	0.00	0.00	0.00	c12
IRPEF+SSC +IRAP	Pub. Transf.	-	0.00	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.01	c13
	Pub. Spend.	-	0.01	0.03	0.02	0.01	0.00	0.00	0.00	0.00	c14
	VAT	+	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	c15
	TASI	+	-0.03	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	c16
LM	Pub. Transf.	+	-0.01	-0.02	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	c17
	Pub. Spend.	+	-0.02	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	c18
	VAT	-	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	c19
	TASI	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	c20
PM	Pub. Transf.	+	-0.05	-0.13	-0.09	-0.07	-0.01	-0.01	-0.01	-0.01	c21
	Pub. Spend.	+	-0.08	-0.09	0.00	0.02	0.00	0.00	0.00	0.00	c22
	VAT	-	-0.03	-0.02	0.01	0.01	0.00	0.00	0.00	0.00	c23
	TASI	-	0.05	0.02	0.01	0.01	0.00	0.00	0.00	0.00	c24
LM+PM	Pub. Transf.	+	-0.06	-0.13	-0.09	-0.06	-0.01	-0.01	-0.01	-0.01	c25
	Pub. Spend.	+	-0.10	-0.10	-0.01	0.01	0.00	0.00	0.00	0.00	c26
	VAT	-	-0.04	-0.03	0.00	0.01	0.00	0.00	0.00	0.00	c27
	TASI	-	0.05	0.02	0.01	0.01	0.00	0.00	0.01	0.01	c28
IRPEF+SSC +IRAP+LM	Pub. Transf.	+	-0.01	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.01	c29
	Pub. Spend.	+	-0.01	0.03	0.01	0.00	0.00	0.00	0.00	0.00	c30
	VAT	-	-0.02	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	c31
	TASI	-	-0.03	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	c32
IRPEF+SSC +IRAP+LM +PM	Pub. Transf.	+	-0.06	-0.12	-0.08	-0.06	-0.01	-0.01	-0.01	-0.01	c33
	Pub. Spend.	+	-0.09	-0.06	0.02	0.02	0.00	0.00	0.00	0.00	c34
	VAT	-	-0.04	-0.03	0.00	0.01	0.00	0.00	0.00	0.00	c35
	TASI	-	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	c36

Note: The values indicate GDP percentage deviations from the baseline in Table A1 after fiscal and/or structural reforms. Labour tax wedge includes IRPEF (labour income tax), SSC (social security contributions paid only by employers), and IRAP (regional tax on productive activities). LM: labour market reform (reduction in wage markup); PM: product market reform (reduction in price markup); LM+PM simultaneous labour and product market reform. All experiments assume a balanced budget scenario. Fiscal coverages to balance the budget, after any shock, include: public spending or transfer adjustment; VAT or TASI (house services tax) adjustment. ΔLP: long-run fiscal coverage change.

Table A7. Fiscal and structural reforms with a lower LTV ratio (households)
(marginal GDP percentage deviation from baseline)

Reform	Coverage	Δ LP	1st year				3rd year	5th year	10th year	20th year	Column
			IQ	IIQ	IIIQ	IVQ	IQ	IQ	IQ	IQ	
IRPEF	Pub. Transf.	-	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	c1
	Pub. Spend.	-	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	c2
	VAT	+	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	c3
	TASI	+	0.04	0.02	0.01	0.00	0.00	0.00	0.00	0.00	c4
SSC	Pub. Transf.	-	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	c5
	Pub. Spend.	-	-0.03	-0.02	-0.01	-0.01	0.00	0.00	0.00	0.00	c6
	VAT	+	-0.02	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	c7
	TASI	+	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	c8
IRAP	Pub. Transf.	-	0.00	0.01	0.00	0.00	0.01	0.01	0.01	0.01	c9
	Pub. Spend.	-	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	c10
	VAT	+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	c11
	TASI	+	0.04	0.01	0.01	0.00	0.00	0.00	0.00	0.00	c12
IRPEF+SSC+ IRAP	Pub. Transf.	-	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	c13
	Pub. Spend.	-	-0.02	-0.02	-0.01	0.00	0.00	0.00	0.00	0.00	c14
	VAT	+	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	c15
	TASI	+	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	c16
LM	Pub. Transf.	+	-0.62	-1.22	-1.32	-1.22	-0.76	-0.53	-0.70	-0.80	c17
	Pub. Spend.	+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	c18
	VAT	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	c19
	TASI	-	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	c20
PM	Pub. Transf.	+	0.90	1.17	1.11	0.95	0.23	-0.13	-0.06	0.21	c21
	Pub. Spend.	+	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	c22
	VAT	-	0.03	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	c23
	TASI	-	-0.08	-0.03	-0.01	0.00	0.01	0.00	0.00	0.00	c24
LM+PM	Pub. Transf.	+	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	c25
	Pub. Spend.	+	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	c26
	VAT	-	0.02	-0.04	-0.05	-0.05	-0.04	-0.02	-0.01	0.01	c27
	TASI	-	-0.08	-0.03	-0.01	0.00	0.01	0.00	0.00	0.00	c28
IRPEF+SSC+ IRAP+LM	Pub. Transf.	+	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	c29
	Pub. Spend.	+	-0.02	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	c30
	VAT	-	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	c31
	TASI	-	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	c32
IRPEF+SSC+ IRAP+LM+ PM	Pub. Transf.	+	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	c33
	Pub. Spend.	+	0.01	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00	c34
	VAT	-	0.02	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	c35
	TASI	-	-0.06	-0.02	-0.01	0.00	0.01	0.00	0.00	0.00	c36

Note: The values indicate GDP percentage deviations from the baseline in Table A1 after fiscal and/or structural reforms. Labour tax wedge includes IRPEF (labour income tax), SSC (social security contributions paid only by employers), and IRAP (regional tax on productive activities). LM: labour market reform (reduction in wage markup); PM: product market reform (reduction in price markup); LM+PM simultaneous labour and product market reform. All experiments assume a balanced budget scenario. Fiscal coverages to balance the budget, after any shock, include: public spending or transfer adjustment; VAT or TASI (house services tax) adjustment. ΔLP: long-run fiscal coverage change.

**Table A8. Fiscal and structural reforms with a lower LTV ratio (entrepreneur)
(marginal GDP percentage deviation from baseline)**

Reform	Coverage	Δ LP	1st year				3rd year	5th year	10th year	20th year	Column
			IQ	IIQ	IIIQ	IVQ	IQ	IQ	IQ	IQ	
IRPEF	Pub. Transf.	-	-0.02	-0.08	-0.08	-0.07	-0.07	-0.08	-0.09	-0.09	c1
	Pub. Spend.	-	-0.01	0.01	0.01	0.01	0.00	0.00	-0.01	-0.01	c2
	VAT	+	-0.01	-0.01	0.00	0.00	0.00	0.00	-0.01	-0.01	c3
	TASI	+	-0.01	-0.01	0.00	0.00	0.00	-0.01	-0.01	-0.01	c4
SSC	Pub. Transf.	-	-0.02	-0.07	-0.08	-0.08	-0.08	-0.09	-0.09	-0.09	c5
	Pub. Spend.	-	0.01	0.01	0.00	0.00	-0.01	0.00	0.00	0.00	c6
	VAT	+	0.00	0.00	0.00	0.00	-0.01	-0.01	-0.01	0.00	c7
	TASI	+	-0.01	-0.01	0.00	0.00	-0.01	-0.01	-0.01	0.00	c8
IRAP	Pub. Transf.	-	-0.02	-0.08	-0.08	-0.08	-0.08	-0.09	-0.09	-0.09	c9
	Pub. Spend.	-	0.00	0.00	-0.01	-0.01	-0.02	-0.01	-0.01	0.00	c10
	VAT	+	0.00	-0.02	-0.02	-0.02	-0.02	-0.01	-0.01	0.00	c11
	TASI	+	-0.06	-0.03	-0.01	-0.01	-0.01	-0.01	-0.01	0.00	c12
IRPEF+SSC + IRAP	Pub. Transf.	-	-0.02	-0.08	-0.08	-0.08	-0.08	-0.08	-0.09	-0.09	c13
	Pub.Spend.	-	0.00	0.00	0.00	0.00	-0.01	-0.01	-0.01	0.00	c14
	VAT	+	0.00	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	0.00	c15
	TASI	+	-0.03	-0.02	-0.01	-0.01	-0.01	-0.01	-0.01	0.00	c16
LM	Pub. Transf.	+	-0.64	-1.30	-1.40	-1.30	-0.84	-0.62	-0.79	-0.90	c17
	Pub. Spend.	+	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	c18
	VAT	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	c19
	TASI	-	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	c20
PM	Pub. Transf.	+	0.86	1.05	0.98	0.82	0.09	-0.25	-0.17	0.12	c21
	Pub. Spend.	+	-0.02	-0.09	-0.09	-0.07	-0.03	-0.02	-0.01	0.01	c22
	VAT	-	0.02	-0.03	-0.05	-0.04	-0.03	-0.02	-0.01	0.01	c23
	TASI	-	-0.10	-0.03	-0.04	-0.04	-0.03	-0.03	-0.01	0.01	c24
LM+PM	Pub. Transf.	+	-0.02	-0.10	-0.11	-0.12	-0.13	-0.12	-0.10	-0.09	c25
	Pub. Spend.	+	-0.03	-0.09	-0.09	-0.07	-0.04	-0.03	-0.01	0.01	c26
	VAT	-	0.02	-0.04	-0.05	-0.05	-0.04	-0.02	-0.01	0.01	c27
	TASI	-	-0.12	-0.03	-0.04	-0.04	-0.03	-0.03	-0.01	0.00	c28
IRPEF+SSC + IRAP+LM	Pub. Transf.	+	-0.02	-0.08	-0.08	-0.08	-0.08	-0.09	-0.09	-0.09	c29
	Pub. Spend.	+	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.01	0.00	c30
	VAT	-	0.00	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	0.00	c31
	TASI	-	-0.04	-0.02	-0.01	-0.01	-0.01	-0.01	-0.01	0.00	c32
IRPEF+SSC + IRAP+LM +PM	Pub. Transf.	+	-0.02	-0.10	-0.12	-0.12	-0.13	-0.12	-0.10	-0.09	c33
	Pub. Spend.	+	-0.02	-0.08	-0.09	-0.08	-0.04	-0.03	-0.01	0.00	c34
	VAT	-	0.02	-0.04	-0.06	-0.05	-0.05	-0.03	-0.01	0.00	c35
	TASI	-	-0.15	-0.05	-0.05	-0.05	-0.04	-0.04	-0.02	0.00	c36

Note: The values indicate GDP percentage deviations from the baseline in Table A1 after fiscal and/or structural reforms. Labour tax wedge includes IRPEF (labour income tax), SSC (social security contributions paid only by employers), and IRAP (regional tax on productive activities). LM: labour market reform (reduction in wage markup); PM: product market reform (reduction in price markup); LM+PM simultaneous labour and product market reform. All experiments assume a balanced budget scenario. Fiscal coverages to balance the budget, after any shock, include: public spending or transfer adjustment; VAT or TASI (house services tax) adjustment. ΔLP: long-run fiscal coverage change.

Table A9. Fiscal and structural reforms with an increase in public investment (marginal GDP percentage deviation from baseline)

Reform	Coverage	Δ LP	1st year				3rd year	5th year	10th year	20th year	Column
			IQ	IIQ	IIIQ	IVQ	IQ	IQ	IQ	IQ	
IRPEF	Pub. Transf.	-	-0.15	0.29	0.42	0.53	0.94	1.13	1.28	1.14	c1
	Pub. Spend.	-	-0.27	-0.86	-0.22	0.17	0.74	0.98	1.58	2.11	c2
	VAT	+	1.64	-0.12	0.25	0.47	0.86	1.08	1.46	1.62	c3
	TASI	+	-7.21	1.65	1.49	1.22	0.88	1.15	1.48	1.62	c4
SSC	Pub. Transf.	-	-0.15	0.20	0.37	0.46	0.83	1.01	1.14	0.99	c5
	Pub. Spend.	-	-0.46	-0.30	0.10	0.30	0.58	0.97	1.58	2.11	c6
	VAT	+	1.34	0.24	0.44	0.54	0.75	1.07	1.46	1.62	c7
	TASI	+	-5.06	1.36	1.17	0.92	0.78	1.14	1.48	1.63	c8
IRAP	Pub. Transf.	-	-0.15	0.19	0.36	0.45	0.81	0.98	1.10	0.96	c9
	Pub. Spend.	-	-1.15	-0.32	0.12	0.35	0.64	0.98	1.57	2.09	c10
	VAT	+	1.06	0.06	0.41	0.57	0.79	1.07	1.43	1.58	c11
	TASI	+	-6.50	1.79	1.45	1.11	0.79	1.13	1.45	1.59	c12
IRPEF+SSC+IRAP	Pub. Transf.	-	-0.15	0.19	0.36	0.46	0.82	1.00	1.13	0.98	c13
	Pub. Spend.	-	-0.61	-0.50	0.00	0.27	0.65	0.97	1.58	2.10	c14
	VAT	+	1.34	0.06	0.36	0.52	0.80	1.07	1.45	1.60	c15
	TASI	+	-6.20	1.57	1.36	1.08	0.81	1.13	1.47	1.61	c16
LM	Pub. Transf.	+	-0.15	0.19	0.36	0.46	0.83	1.01	1.14	0.99	c17
	Pub. Spend.	+	-0.45	-0.34	-0.19	-0.05	0.54	0.97	1.64	2.24	c18
	VAT	-	0.13	0.13	0.21	0.33	0.76	1.09	1.53	1.72	c19
	TASI	-	-2.02	-0.61	-0.09	0.13	0.86	1.15	1.56	1.75	c20
PM	Pub. Transf.	+	-0.13	0.22	0.38	0.46	0.78	0.96	1.10	0.95	c21
	Pub. Spend.	+	-0.40	-0.18	-0.03	0.09	0.55	0.94	1.61	2.21	c22
	VAT	-	0.13	0.15	0.23	0.34	0.73	1.05	1.48	1.69	c23
	TASI	-	-1.88	-0.48	0.01	0.19	0.80	1.10	1.53	1.73	c24
LM+PM	Pub. Transf.	+	-0.13	0.22	0.38	0.46	0.78	0.95	1.09	0.95	c25
	Pub. Spend.	+	-0.40	-0.18	-0.03	0.09	0.55	0.94	1.61	2.21	c26
	VAT	-	0.13	0.14	0.23	0.34	0.73	1.05	1.48	1.68	c27
	TASI	-	-1.89	-0.48	0.00	0.19	0.80	1.10	1.53	1.74	c28
IRPEF+SSC+IRAP+LM	Pub. Transf.	+	-0.15	0.19	0.36	0.45	0.82	0.99	1.13	0.98	c29
	Pub. Spend.	+	-0.46	-0.35	-0.20	-0.05	0.54	0.96	1.63	2.23	c30
	VAT	-	0.13	0.12	0.21	0.32	0.75	1.08	1.52	1.71	c31
	TASI	-	-2.01	-0.59	-0.07	0.14	0.86	1.13	1.54	1.73	c32
IRPEF+SSC+IRAP+LM+PM	Pub. Transf.	+	-0.13	0.22	0.38	0.46	0.77	0.94	1.08	0.94	c33
	Pub. Spend.	+	-0.40	-0.19	-0.04	0.08	0.55	0.93	1.60	2.20	c34
	VAT	-	0.13	0.14	0.23	0.33	0.72	1.04	1.47	1.68	c35
	TASI	-	-1.89	-0.47	0.02	0.20	0.79	1.09	1.51	1.71	c36

Note: The values indicate GDP percentage deviations from the baseline in Table A1 after fiscal and/or structural reforms. Labour tax wedge includes IRPEF (labour income tax), SSC (social security contributions paid only by employers), and IRAP (regional tax on productive activities). LM: labour market reform (reduction in wage markup); PM: product market reform (reduction in price markup); LM+PM simultaneous labour and product market reform. All experiments assume a balanced budget scenario. Fiscal coverages to balance the budget, after any shock, include: public spending or transfer adjustment; VAT or TASI (house services tax) adjustment. ΔLP: long-run fiscal coverage change.

Table A9bis. Fiscal and structural reforms with an increase in public investment (marginal GDP percentage deviation from baseline)

Reform	Coverage	Δ LP	1st year				3rd year	5th year	10th year	20th year	Column
			IQ	IIQ	IIIQ	IVQ	IQ	IQ	IQ	IQ	
Increase in government investment (1 pp of Gdp)											
PUBLIC INVESTMENT	Pub.Transf.	+	-0.12	0.34	0.51	0.60	0.98	1.16	1.31	1.17	c37
	Pub.Spend	+	-0.45	-0.33	-0.19	-0.05	0.53	0.96	1.64	2.24	c38
	VAT	-	0.13	0.13	0.22	0.33	0.76	1.09	1.53	1.72	c39
	TASI	-	-2.01	-0.60	-0.08	0.13	0.86	1.15	1.56	1.74	c40

Note: The values indicate GDP percentage deviations from the baseline in Table A1 after an increase in public investment. All experiments assume a balanced budget scenario. Fiscal coverages to balance the budget, after the shock, include: public spending or transfer adjustment; VAT or TASI (house services tax) adjustment. ΔLP: long-run fiscal coverage change.

Table A10. Fiscal and structural reforms: balanced vs unbalanced budget (marginal GDP percentage deviation from baseline)

Reform	Budget	1st year				3rd year	5th year	10th year	20th year
		IQ	IIQ	IIIQ	IVQ	IQ	IQ	IQ	IQ
IRPEF	Balanced	0.34	-0.09	-0.18	-0.17	-0.03	0.10	0.12	0.15
	Unbalanced	1.25	0.06	-0.67	-1.17	-1.90	-0.65	0.37	0.72
SSC	Balanced	0.25	0.17	0.20	0.22	0.17	0.07	0.08	0.09
	Unbalanced	0.94	0.31	-0.12	-0.43	-0.94	-0.29	0.23	0.42
IRAP	Balanced	-0.12	-0.14	-0.09	-0.04	0.08	0.15	0.36	0.53
	Unbalanced	0.70	0.12	-0.30	-0.60	-1.06	-0.23	0.52	0.86
LM	Balanced	0.12	0.13	0.17	0.22	0.40	0.49	0.56	0.61
	Unbalanced	-0.12	0.32	0.61	0.82	1.06	0.64	0.45	0.41
PM	Balanced	0.91	2.53	2.74	2.58	1.86	1.57	1.88	2.12
	Unbalanced	-0.47	2.76	4.35	5.17	4.70	1.91	1.38	1.25
PUBLIC INVESTMENT	Balanced	-0.45	-0.33	-0.19	-0.05	0.53	0.96	1.64	2.24
	Unbalanced	-2.50	5.02	9.82	11.80	4.00	1.46	0.41	0.31

Note: Balanced budget implies public spending adjustment as fiscal coverage in both the short and the long run (for further details, see Table A1); unbalanced budget implies a public debt adjustment in both the short and the long run, and only a transitory government spending adjustment.