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24 February 2015

Online at <https://mpra.ub.uni-muenchen.de/62372/>

MPRA Paper No. 62372, posted 28 Feb 2015 09:01 UTC

Effects of fiscal policy in the North and South of Italy¹

P. Piacentini[♦], S. Prezioso^ª and G. Testa[§]

Abstract: This paper contributes to a growing body of work within ‘fiscal policy studies’, investigating for the recent role of fiscal policy on the Italian economy. Using annual data collected on regional basis, this study estimates and compares the (impact and cumulative) fiscal multipliers across the North and the South, the less developed area, of Italy. With recourse to a simultaneous equation model for the two macro-regions of Italy, it estimates the overall impact of the measures of budget consolidation policies in the period 2011-2013. Our analysis reveals that tax rises and spending cuts hit the South harder than the North.

Keywords: Tax multiplier, Government spending multiplier, Fiscal Policy.

JEL: E23, E62, H22, H24

1. Introduction

There is a widespread concern in Europe among economists, policy-makers and the public at large about the economic consequences of fiscal consolidation. Such concern is a response to the great recession Europe has gone through. Indeed, in recent years, a wide-range of analyses (AUERBACH and GORODNICHENKO, 2012; ILZETZKI *et al.*, 2011; BLANCHARD and LEIGH, 2013) were carried out to evaluate the conducts and effects of fiscal policy measures. Different aspects of fiscal policies (such as the direct effect of fiscal policies, the timing of its implementation, the coordination of fiscal and monetary action, etc.) have been under investigation in order to approach an overall judgment for the effects of such policies. The most complete and influential among these is probably the Survey by IMF, included in the World Economic Outlook of 2012, in which the effects of fiscal consolidations are considered in depth, and suggesting evidences on how fiscal multipliers might have been higher than expected, during the most recent economic recession. In Italy, there are still few works upon the impact of fiscal policies during the recent Italian economy downturn (LOCARNO *et al.*, 2014; CIMADOMO and D’AGOSTINO, 2014; CAPRIOLI e MOMIGLIANO, 2011; GIORDANO *et al.*, 2007). In the work of CIMADOMO and D’AGOSTINO (2014) an estimate is given for the fiscal multiplier, which ranges from 0.8 to 0.9 from the mid-1990s to the late 2000s, and rises above unity in the context of the recent crisis. However, most of these studies are based upon simulation models, and consider only the result for national aggregation. This paper, instead, considers time-series drawn

¹ We wish to thank Prof. P. Arestis for his important comments and suggestions.

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from a regionally disaggregated database made available from the Italian statistical office (ISTAT), and utilizes a full-scale macro-economic simultaneous equation model to evaluate the short and long run implications of the recent measures of fiscal tightening. More precisely, drawing on theoretical and empirical literature, underlying the dualistic characteristics of the Italian economy (PANICCIÀ et al., 2011; PIACENTINI and SULIS, 2000; PADOA SCHIOPPA KOSTORIS, 1999; PANICCIÀ, 1999) this paper explores the impact of episodes of fiscal tightening (undertaken under Berlusconi and Monti's government over the period 2011-2013) on the regional GDP, separately for the North, and the South of Italy². The paper is organized as follows. Section 2 presents theoretical background, methodological approach, and research hypotheses. To this follows, in the Sections 3 and 4, the presentation and discussion of our data and empirical findings. We first consider the incidence tax rises and spending cuts have had in reducing regional GDP, and then we provide quantitative estimates for the fiscal multipliers for the North-Centre and the South of Italy. Section 5 concludes, with a brief discussion on how our empirical findings relate to other evidence, and with a brief appraisal of the implications for policy.

2. Theoretical underpinnings, empirical strategy, and research hypotheses

*2.1 The reference macroeconomic model*³ The reference macroeconomic model, used for the policy evaluations is, basically, a “Keynesian” model, where changes in output and labour are driven by the final demand-side. Price equations are modelled as determined following a “full cost” pricing hypothesis; in particular, it assumes that firms in the service sectors operate in a context of imperfect competition, whereas manufacturing firms are conditioned by an internationally competitive and oligopolistic industrial environment. This implies that both service and manufacturing firms are price-setters for their output, pursuing a target of a margin over the “full-cost” of their operation. On the demand side, we model investment in terms of an “eclectic” frame, which includes “accelerator”, together with “neoclassical” determinants (interest rates relevant in each case). We assume that fluctuations in variables, such as sales and cash flows, positively affect firms investment decisions, according to mechanisms broadly referred to as the ‘accelerator principle’ in the economic literature. Further, in our model, as originally suggested by P. Stylos-Labini (1962), the model specification is extended to include two further channels influencing investment decision. The first of these, the “liquidity” channel, stresses the role of “liquidity” sources both internal, i.e. cash-flow, and “external”, as proxied by the total bank credit/M3 ratio for each reference sector, in sustaining firm's investment. The second linkage has as its basic indicator the “capacity utilization rate”, and suggests that firm investment propensities are influenced by the difference between actual sales and potential capacity. The changes in nominal interest rates are included to affect the level of investment (with one- year lag).

The theoretical framework for modelling consumption is the extension of the standard Keynesian consumption function with Pigou wealth effect. The function is estimated through an ECM procedure. The long run equation relates consumption with disposable income and wealth; as for the

² See Appendix A for the relevance of the dualistic structure in Italy.

³ See Appendix B for a description of the model specification for the key variables.

short-term behavior, this is affected by four variables: changes in real disposable income; M3 owned by households; changes in the interest rate on quarterly Treasury bonds, as basic reference for the cost opportunity to retain saving (Hicks effect), and the consumption expenditure of foreign tourists (which appears significant only for the Northern area), given that our dependent variable refers to "domestic" consumption, so to include also non-resident expenditure. The short-term consumption function also includes, according to ECM formulation, the correction variables derived from the long run equation residuals.

The introduction of the capacity utilization rate in the investment equation calls for a specification of the model also for a "supply-side". If the demand-side follows basically a "Keynesian" frame, our specification for the potential on the supply-side derive essentially out of a "Kaldorian" inspiration. According to Kaldor, in fact, "*More recent investigations have also revealed that whilst in the course of economic progress the value of the capital equipment per worker (measured at constant prices) and the value of the annual output per worker (also in constant prices) are steadily rising, the trend rates of increase of both of these factors has tended to be the same, so as to leave the capital/output ratio virtually unchanged over longer periods*" (Kaldor, 1957, p. 592). This means that, while the capital-output ratio is stable over time, there are "technological" forces at work that may shift the "Technical Progress Function", relevant to each economy, upwards over time. In this view, Kaldor undoubtedly is an anticipator of models of the new growth theories, where production functions are characterised by 'dynamic increasing returns', allowing possibility of shifts of the steady state growth rate. In the same way as for consumption function, we estimate the short-run supply function in an ECM form, as we expect potential output to fluctuate around their long-run cointegration norm and not to drift away. Finally, the short and long-run coefficients are separately estimated for the North and the South of Italy, because we believe fundamental economic condition in the North to diverge significantly from those prevailing in the South. This implies that the structural differences of these two "regional" economies will affect, in a relevant extent, their differential responses to fiscal policy shocks.

2.2 Empirical strategy, and research hypotheses. In this study the fiscal multipliers have been estimated, throughout the whole range of interactions following the changes in the values of exogenous fiscal variables and parameters, as allowed within the use of the "Bi-regional" macroeconomic model of the Italian economy (NMODS) developed by SVIMEZ⁴. This model includes about two hundred behavioral and definitional relations, modelled to capture as far as possible the diversities of the economic structure and behavior in the North and South of Italy. This model was originally developed to identify and test for the main factors differentiating macroeconomic relationships in the North and South of Italy. At present, this model is run mainly to produce short-term forecasts (for the current and the following year) for GDP, consumption and employment, (etc.) in the two macro-areas of the country, also allowing for evaluations of policy innovations. Structural relations are wholly specified for all endogenous variables⁵. These variables can be broadly included within eight "blocks": Prices (consumer prices, industrial prices and export

⁴ Association for the development of the *Mezzogiorno*.

⁵ See Appendix B for the specification of investment and consumption functions.

prices); Supply-side (value added and GDP); Demand-side (consumption, investment,); Labor market (numbers in employment, unemployment rate); Distributional variables (gross operating margins, gross wages); Foreign Trade (exports, and imports); Monetary market (M3, relevant interest rates); Fiscal factors (direct and indirect taxes, the public expenditure side) are appropriately introduced in the model, as exogenous variables.

In what follows we focus on the fiscal instruments that government can use in function of its targets (e.g. to keep current public deficit in the year not higher than the 3% limit). These include direct (income taxes and national insurance contributions), indirect taxes (as VAT and housing tax), and government expenditure (purchases of goods and services, both current and capital account).

2.3 Income tax changes and demand: what we would expect. Mainstream theory suggests that temporary changes in income taxes will have a small impact on consumption when consumers are forward-looking. For example, in the case of an income tax increase, forward-looking economic agents will not reduce their consumption but will rather offset this increase by an equivalent reduction in private savings, because they perceive that tax burden to be reduced in the future. If they are smoothing consumption over time, their demand response will be small, or at the limit zero with a full “Ricardian equivalence”. The actual impact of income tax changes on demand will however depend on the propensities to consume of the population affected. In the context of our dualistic structure, we would then expect people living in the North of Italy (i.e. with a higher average income) to have a lower propensity to consume out of current income than those living in the South with a lower-income on average. Only the better-offs are likely to have margin to smooth the impact on their consumption of fiscal shocks, through the adjusting of their saving balance; moreover, the recent evidences on high values of multipliers in recession cast doubts, upon the incidence of liquidity-unconstrained, “neoclassically rational” consumers on actual population. Less well-off people are likely to be liquidity constrained, and so their consumption should be closely related to their current income. Consequently, we expect changes in income taxes affecting taxpayers living in the North to have lesser short-term impact on demand than changes of equivalent size, affecting tax-payers living in the South. Upon these considerations, we formulate the following hypothesis:

H1. A temporary rise in income taxes has a greater impact in the South than in the North because of the higher propensity to consume in the South where gdp per person is quite in significant measure inferior to that of the North and this should reflect in the values of the impact multipliers.

Consumption tax changes and demand: what we would expect. A temporary reduction (increase) in consumption taxes, such as the VAT rate, would reduce (increase) the relative price of spending today compared with spending in the future. This would encourage all households (including forward-looking consumers not liquidity-constrained) to consume more (less) now and less (more) in the future. Within our dualistic frame, we would then expect that:

H2. Higher consumption taxes are likely to impact more in the North than in the South in the short term. In the longer-run, given broadly similar specifications for prices and consumers behaviour in the two areas, these differential effects should weaken by most; however, the depressive effect as a whole on demand should persist, given that full compensation, coming from productivity increase or a downward flexibility of the “mark-up” to demand, is unlikely.

From our evidences from the price equations, we can see that these are more “flexible” in the North than in the South, given presumably a greater interaction with foreign operators, and the wider diffusion of great distributive chains⁶. Higher price flexibility may however imply a more rapid transfer of indirect tax changes into prices consumers pay. Indeed, GIUNTA *et al.* (2011) and CAMUFFO *et al.* (2007) observe in their analysis of subcontracting firms in Italy, Northern firms differ from their counterparts based in the South, as they are engaged in stages of production with a higher value added and as they have greater bargaining power in front to their customers, possibly implying a higher capability to translate downstream the increases in indirect taxation. Another possible implication of the greater flexibility of prices and wages in the North, and the openness to foreign trade there, is that indirect tax rise may increase imports, and decrease market share for domestic output, in the North by more than in the South. When the transfer of tax rises on sale prices is accomplished, although with some delay, also in the less dynamic region, this rationale, for the differential multiplier impact of consumer tax amongst the areas, should be weakened in the longer run.

Government spending changes and demand. On the spending side, a positive shock in government expenditure increases indeed demand in the short-run. Still in a longer-run, theory suggests government investment, and government consumption, in areas such as education or provision of high quality public services, can affect the long-run growth rate of an economy, since they positively impact upon productivity. It follows that:

H3. Government expenditures are likely to have an impact on the total aggregate demand of the South by more than in the North (both in the short and in the long run) because the activation of the Southern economy is conditioned by Government spending far more strongly than in the Northern economy. This fact is well documented by a large body of Italian literature stressing the importance of the public funding for the Southern economy (Del Monte and Giannola, 1997; Vittorio, 2009; Scalera and Zazzaro, 2010).

H4. Further, as firms in the South are particularly dependent on government expenditure (such as public works), as suppliers of intermediate goods and services, public investment cuts will impact negatively upon total demand in the South, by more than in the North.

3. Our data and fiscal tightening composition in Italy

In what follows, we first illustrate the size of recent fiscal tightening at the national and the regional levels. We thus look at the size of government’s spending cuts and tax increases, over the period 2011-2013, and their impacts separately for the North and the South of Italy.

⁶ To the extent to which firms set the price as follows: $P_i = C_i + \alpha C_i$ where P_i is the price of firm i , C_i the full cost, and α is the margin over full cost, and if α depends upon firm’s higher technological capability, firms located in the North may target a higher price than firms located in the South. This means then that an increase in cost due to the taxation might turn into a price increase larger in the North than in the South in the short term. Other research work within SVIMEZ reveals that the South accounts for about 30% of all typologies of work which might be defined as “atypical” or “informal”(occasional dependent, and non dependent, work, etc.); this implies that the influence of traditional factors behind price fluctuations in the more developed economies, such as unit cost of labour calculated from official indexes of labour remuneration and productivity, might have, in the immediate, a smaller incidence in the determination of fluctuations of consumer prices.

Table 1 shows that the amount of total fiscal tightening was worth €59 billion over the budget for 2012, and with a further increase of €26 billion in the budget planned by the end of 2013. Thus, the overall value of fiscal tightening should approach €85 billion over the whole range to 2013. The partition between the tax and the spending items for this overall tightening are as follows: tax increases worth some €44 billion in 2012, and worth €10 billion by 2013; spending cuts worth some €15 billion in 2012, and with a further €17 billion cut in 2013. Thus, over the 2011-2013 range, taxes will have been raised by about €54 billion, (with most of the increase in 2012), and the spending, cut by about €32 billion (mostly in 2013), as result of the implementation of the package of “consolidation policies”.

Tab. 1. Cumulated effects on public debt (€ million)

	2011	2012	2013
Overall fiscal tightening	14,970	73,907.6	100,778.2
Tax increase	5,752	49,480.1	59,066.5
Spending cut	9,218	24,427.5	41,711.7

Source: Our calculation on ISTAT and SVIMEZ data.

Looking at table 2, which reports the estimated composition of fiscal tightening by macro region, we can see that, when looking at absolute values, these seem to hit the North harder than the South. In the North additional tightening is worth about €43 billion in 2012 and about €18 billion additionally in 2013, while in the South is about €16 billion in 2012, and about €9 billion over the year 2013. However, when thought in relative terms with respect to a regional income, we can see that the South suffers more than the North (7.6% of regional income against 5.3% cumulated by the year 2013).

Tab. 2 Composition of fiscal tightening for Italy, over 2011-2013

	Cumulated values in billion euros			As % of GDP		
	2011	2012	2013	2011	2012	2013
North	10.8	53.4	71.2	0.8	4.2	5.3
South	4.2	20,3	29,5	1.1	5.4	7.6
Total	14.9	73.8	100.7	0.9	4.5	5.9

Source: Our calculation on ISTAT and SVIMEZ data.

It is also interesting to consider further breakdown for the tax rises and the spending cuts across the two broad regions of Italy. From table 3, reporting separately tax rises and spending cuts we can see that tax increases will amount to 3.4% of national income by 2013, while spending cuts will amount to 2.4% of national income by 2013. At 3.7% of regional income the South will have a slightly higher tax burden than the North (at 3.4% of its income), whereas at 4% of regional income, the South of the country will suffer more from the spending cuts than the North, (at just 2%). Thus, it seems

that the South of the country will receive less by the central government by paying more, or as much, in taxes as the North of the country, in relative terms with respect to the size of its economy⁷.

Tab. 3 Government spending cuts and tax increases in Italy

	Cumulated values in billion euros			As % of GDP		
	2011	2012	2013	2011	2012	2013
Tax						
Total	5.8	49.5	59.1	0.3	0.3	3.4
North	5.0	37.9	44.9	0.4	0.3	3.4
South	0.7	11.6	14.2	0.2	3.1	3.7
Government spending						
Total	9.2	24.3	41.6	0.6	1.5	2.4
North	5.8	15.6	26.3	0.5	1.2	2.0
South	3.4	8.7	15.3	0.9	2.3	4.0

Source: Our calculation on ISTAT and SVIMEZ data.

Tables 4 and 5 show details for values of these fiscal items across the two regions. Table 4. shows that income taxes will have increased by 0.7% of national income by the end of 2013. At regional level, at 0.7% of regional income, the North carries a higher load of income taxes as against 0.5% of income of the South over the same period. Personal tax rise is higher in the North than in the South of Italy mainly because, in the average, in the North people earn more than in the South (therefore have higher average and marginal rates). Consumption tax rise will account for about 2.5% of national income by 2013; at 3.0% of regional income, the South appears to carry a higher load of consumption taxes rise as against 2.4% in the North. Indeed, given a lower average income and a higher consumption propensity, in the South people would pay, proportionally, greater shares of their income in sales and excise taxes, than those living in the North.

⁷ It is worth noting that the greater part of the rise in taxation reflects growth of indirect taxes (mainly hitting households) and the greater part of the cut in government spending reflects declining government consumption (that is public sector wages and payments on current materials and services in use) and public investment (e.g. infrastructures).

Tab.4 Direct and indirect taxes, 2011-2013 (cumulated values, and % GDP)

	Cumulated values in billion euros			As % of GDP		
	2011	2012	2013	2011	2012	2013
Income tax increase						
Total	2.2	12.1	11.6	0.1	0.7	0.7
North	2.3	10.0	9.7	0.2	0.8	0.7
South	-0.1	2.0	1.9	0.0	0.5	0.5
Consumption tax increase (e.g. VAT increase)						
Total	2.5	34.3	43.5	0.1	2.1	2.5
North	1.8	25.4	32.1	0.1	2.0	2.4
South	0.6	8.9	11.5	0.2	2.4	3.0

Source: Our calculation on ISTAT and SVIMEZ data.

In Table 5 it is shown that spending cuts in public consumption will amount to 0.7% of national income, and capital account spending cuts to 0.6% of national income by 2013. At 1.2% and 1.1 % of the regional income, the South has, for both capital and consumption cuts, a higher incidence than the North. Thus, the picture evidenced from these tables shows how fiscal tightening does not impact in equal measure across the two area. In the following section, the further implications of these austerity measures, through their “multiplier” effects, are checked.

Tab. 5 Consumption spending, and capital spending cuts, 2011-2013 (cumulated values, and % GDP)

	Cumulated values in billion euros			As % of GDP		
	2011	2012	2013	2011	2012	2013
Consumption spending cut						
Total	3.8	7.2	12.4	0.2	0.4	0.7
North	2.5	4.6	7.9	0.2	0.4	0.6
South	1.3	2.6	4.5	0.3	0.7	1.2
Capital spending cut						
Total	1.8	8.3	9.9	0.1	0.5	0.6
North	1.1	5.0	5.5	0.1	0.4	0.4
South	0.7	3.3	4.4	0.2	0.9	1.1

Source: Our calculation on ISTAT and SVIMEZ data.

4. Estimates of fiscal multipliers for the North and South of Italy

Through innovations introduced in the exogenous values and parameters for fiscal policy NMODS, bi-regional macroeconomic model, may be utilized for the estimation of the fiscal multipliers, both “impact” and “cumulative”. In Table 6 we report the estimated values of these multipliers for both area. Here, impact multipliers refer to the response of output to a given change of fiscal variables within the same year; cumulative multipliers simulate for the overall impact at the end of a five-year horizon, given the hypothesis of fiscal innovations being steadily maintained over this period. We focus in particular on the two tax measures, i.e. income tax and consumption tax rises, and two spending measures, i.e. public consumption spending cuts and capital spending cuts. We first look at the impact multiplier and then the cumulative multiplier for the tax increases and the spending cuts. It is worth noting here that the SVIMEZ model is non linear, so our fiscal multipliers are not symmetric⁸.

In the North of Italy, the impact multiplier associated to income tax increase is estimated at -0.23. This implies that an additional euro of collected tax will cause a 0.23 euro reduction in GDP. The impact multiplier of income tax increase for the South of Italy is higher, at -0.38.

Tab. 6 Impact and cumulative multiplier for the North and the South of Italy

		North	South
Tax increase			
Income tax increase	Impact	-0.23	-0.38
	Cumulative	-0.16	-0.43
Consumption tax increase	Impact	-0.30	-0.19
	Cumulative	-0.41	-0.42
Spending cuts			
Consumption spending cut	Impact	-0.44	-0.84
	Cumulative	-0.27	-0.70
Capital spending cut	Impact	-1.45	-1.37
	Cumulative	-1.48	-1.85

Source: Our calculation on ISTAT and SVIMEZ data.

Explanations for this outcome are to be found in the higher average propensity to consume in the Southern regions. An increase in income taxation and consequent decline in the disposable income would then lead to a greater decrease in consumption expenditure in the South. This difference is also mirrored in the cumulative income tax multiplier, which is at -0.16 in the North, while is -0.43 in the South. Personal income taxation will affect the Southern economy more than the Northern in the

⁸ Nonlinearity of the model derives mainly from the fact that structural relations are estimated in logarithmic differences; this implies that the reduced form, from which the multipliers are calculated, will have coefficients which are variable amongst reference periods.

longer run, perhaps because the latter, being more dynamic than the former, is capable to respond to the fall of components of a domestic demand through, say, compensation by exports. But also the higher capability of the Northern economy, in terms of a productivity potential in the medium term being transmitted into increases in income and domestic components of expenditures, might be implied in this result⁹. The impact multiplier for indirect taxes is higher in the North than in the South (-0.30 against -0.19). This may be due to the fact that in the North, firms are capable to transfer these increases upon sales prices by more, or more rapidly, than in the South (as from our point “H3”). The cumulative multiplier instead shows that an additional euro in indirect taxes on goods and services would cause a 0.42 Euro decrease in GDP in the South, as against 0.41 Euro decline in the North. This result, of a practically equivalent value for the multiplier in the long run in the North and South, would suggest that consumption patterns, and preferences of people remain rather stable over the medium term and across the country. This value for the cumulative multiplier for the South is near to what was calculated for the direct income tax, while in the North we do not see the reduction of the multiplier in the long-term, as observed for the direct taxes. This would imply that compensation mechanisms, as hinted above, are less effective in event of increases in VAT, or other forms of indirect taxation (e.g. housing tax), reducing real expenditure power.

On the expenditure side, the estimates of the impact multiplier of government consumption are -0.44 for the North and -0.84 for the South. These values fall to -0.27 in the long-run in the North and -0.70 for the South, indicating that one additional euro decrease in government consumption would eventually cause a 0.27 euro decline in output in the North, and 0.70 euro decrease in the South. So while already in the short-run government consumption spending multiplier is substantially higher in absolute terms, in the South than in the North, in the long-run the North seems capable of better output recovery than the South. This result can be again explained by the scale, and the diversification, of the production structure and market outlets, wider in the North than in the South.

Last (but not least), the estimation results show that the value of government investment multiplier is -1.45 in the short-run, and -1.48 in the long run in the North, compared with -1.37 in the short run and -1.85 in the long run in the South. Two observations ought to be stressed here. First, with a difference with respect to previous cases, government investment multipliers show values above the unity, in both regions. Second, we can notice that, while in the North the difference between short and long run multipliers is contained, in the South the long run multiplier of public investments results significantly higher than the short-run one. Given a South's economy predominantly characterised by the small, or very small scale, of the firms, and specialised in fewer production phases and with scarce connections each other within the same region, it is likely that cuts in government investment spending will eventually depress by more the Southern economy, reducing market outcome for local firms. A cut in expenditure to build a new road, as an example, may damage output and growth of the South by more, because many Southern firms are suppliers of goods and services deeply dependent on government expenditures on public works¹⁰.

⁹ We recall our specification for the supply side in the Appendix B which are in effect estimates of an endogenous “productivity function” (the Kaldorian “Technical Progress Function”). The parameters of these, estimated separately for the North and the South, give a clear evidence of the higher productivity potential of the North.

¹⁰ This can be, more in detail, evidenced by the analysis of the input-output matrices for the North and the South: the latter is in fact more “empty” for many intersectoral transactions (Cherubini *et alii*, 2011).

In conclusion, we present in table 7 the overall summary for the estimates of the impacts of the “emergency budget consolidation” measures implemented by the central and local government in terms of percentage difference from a “baseline” estimation. This exercise confirms that tax rises and spending cuts did hit the South more heavily than the North. The greater output decline in front of tax rises in the South is essentially linked to the “regressive” nature of indirect taxes on products. The reason why the impact of government spending cuts, and in particular cuts in public investment, is higher in the South than in the North, could again be explained by the fact that the public sector has always had a higher weight within the demand composition of the South, with the higher relative incidence in the economy of the construction sector likely to be more heavily struck by government investment cuts. The overall impact of fiscal tightening results, thus, about 1.3 points higher in the South than in the North, in terms of incidence upon regional GDP.

Tab. 7 Effects of public finance manouvre on GDP (%); 2012

	South	North	Italy
Effect due to tax increases	-0.31	-0.23	-0.25
Effect due to spending cuts	-1.77	-0.56	-0.85
Overall effect of the manouvre	-2.08	-0.80	-1.10
Change in GDP	-3.20	-2.10	-2.40

Source: Our calculation on ISTAT and SVIMEZ data.

5. Summary and Conclusions

In this paper we have provided a detailed breakdown, for the incidence of spending cuts and tax rises following fiscal consolidation plans, across the North and the South of our country. Then, we have derived, using the simultaneous equations system from SVIMEZ’s “bi-regional” econometric model of the Italian economy, estimates of the fiscal multiplier, for the assessment of the overall, and differential, incidences on the macroeconomic outcome of the “fiscal austerity” measures, with a breakdown of the incidence for items of spending cuts and tax rises, across the North and the South of our country. Two main results arise from this empirical exercise:

1. Fiscal tightening does not hit equally regions across Italy. A rise in taxes inflicts more damage in the South than in the North. This is mainly so because of the regressive nature of consumption taxes, which make up about 80% of the overall tax increases (direct plus indirect taxes). Indeed, the South presents values of a consumption propensity higher than the North, and will suffer more from higher taxation on incomes and on essential consumption.¹¹
2. Even when considering the country as a whole, a general picture arises, of a country badly suffering government investment cuts. From our evidence, a cut in government

¹¹ We remind that clauses for increases in VAT, or other indirect taxes, are often imposed as a “default clause”, in the consolidation plans agreed with super-national bodice (EEC Commission, IMF) , when “spending review” or other targeted policies fail to meet their quantitative targets.

investment expenditure is the item which has the most dramatic, negative impact on the economy. This is also because of the static or declining trends of private investment in Italy in the recent period. Advancing, as conclusion, a policy proposal consequent to these findings, the application of the so-called “Golden rule”, according to which public investments should be, wholly or partially, excluded from restriction rules on governments deficit, such as the 3% limit, might be an indication for a re-orientation of new fiscal policy rules less penalizing for the economy.

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Appendix A: The dualistic structure in Italy

Most countries have richer and poorer regions within them, but in Italy the gap between the North and the South assumes an unique extension. In what follows, we describe this persistence of a dualistic structure in Italy through an overview of data from the Istituto Nazionale di Statistica (ISTAT; National Statistics Office) on GDP per capita, investment per capita, employment rate, and export share for the years 1951, 1971, 1991, 2001, 2009, and 2012 for the two broad areas. As we can see from Table 1a, in 1951 GDP per head in the South¹² was 43 percent of that in the North of Italy. In 1971 it had risen to 60 percent, and in 2001 has fallen to 57 percent. In the period 2001-2009 the difference between the Southern and Northern GDP per head became wider, to be slightly reduced in the period 2009-2012, after the onset of the global crisis. In 1951, gross fixed capital formation per capita in the South was about 48 percent lower than in the North. The difference in gross fixed capital formation per capita, following extraordinary programmes of a mainly public investment, was reversed (the ratio was at 110 in 1971); it had fallen again to 85 percent at the end of the next period (1991). After 2001, it is registered at 62 percent of that of the North. When looking at the employment rate of the South with respect to the North, this was at about 82-83 percent over the period 1951-1971; it fell to 73 percent in 2001, and to 68 percent in 2012. Finally, table 1a shows that the North has a much higher export share on internal gross product than the South (about 27,8 percent against 8,7 percent in 2012). These tables suggest the persisting relevance of dualistic structure of Italy when analyzing the impacts of fiscal policies. Indeed, our contribution wishes to fill, bringing into consideration the dualistic structure of Italy, a gap still remaining in the existing research on regional and public policy studies. In the following appendix we present some further detail on the methodology of our analysis.

¹² The Italian South or the Mezzogiorno includes eight regions: Abruzzo, Basilicata, Calabria, Campania, Molise, Puglia, Sicily and Sardinia.

Tab 1a. Some features of the North and South of Italy

Years	Mezzo-giorno	Centro-Nord	Mezz/CN (%)
PIL per capita (Euro)			
1951	86.0	198.4	43.3
1971	499.0	827.2	60.3
1991	9288.2	15,868.3	58.5
2001	14,721.8	25,939.0	56.8
2009	17,351.8	29,431.1	59.0
2012	17,415.8	30,007.7	58.0
Gross Fixed investment (Euro)			
1951	21.1	43.5	48.4
1971	180.6	163.7	110.3
1991	2,676.2	3,138.1	85.3
2001	3,275.5	5,224.9	62.7
2009	3,564.0	5,602.3	63.6
2012	3,361.2	5,367.3	62.6
Employment Rate (%)			
1951	40.6	49.0	82.7
1971	38.5	46.0	83.7
1991	45.2	59.3	76.1
2001	44.0	59.8	73.6
2009	44.9	64.9	69.2
2012	43.8	63.8	68.6
Export (a)/PIL (%)			
1951	-	-	
1971	-	-	
1991	4.3	16.6	
2001	8.5	25.3	
2009	6.7	21.8	
2012	8.7	27.8	

(a): Oil products are excluded.

Source: Our calculation on ISTAT and SVIMEZ data.

Appendix B: Essential features of our econometric model

In what follows, we illustrate the determinants of major components of the aggregate demand, and our specification of the supply-side factors¹³.

Aggregate demand (AD)

As in the standard definitions of aggregate demand, our AD includes consumption function, (C), investment function, (I), government expenditure function (G), and export function, (X). AD may activate domestic output or imports.

$$AD=C+I+G+X \quad (1)$$

As we have specific data on investment on capital goods (I^K) and residential and non-residential buildings (I^B), we can rewrite our AD as:

$$AD=C+(I^K+I^B)+G+X \quad (2)$$

In what follows, we focus on these categories and, where is the case, we provide the two differentiated specifications for regressions, one for each regional area. Since consumption function is affected by short-run and long-run factors, our consumption function is modelled through a two-stage procedure using Error-correction specification. The residuals from the long-run consumption function, lagged one period, are added to the determinants of a short run consumption function. Our long run consumption function, (in logarithmic specification), takes the following form:

$$C_t^{Long-Run} = \beta_1 + \beta_2 Y_t + \beta_3 FW_t + \varepsilon_t \quad (3)$$

where $C_t^{Long-Run}$ is of consumption per household, Y_t is the of household disposable income, and FW_t is the of net financial wealth. In this equation, we impose the restriction that the coefficients of the explanatory variables associated to disposable income and financial wealth are equal to 1, so that $\beta_3 = 1 - \beta_2$. We estimate this long-run consumption function separately for the North and the South of Italy. From the above long run equation the ECM specification of consumption function follows for the North and South of Italy, respectively:

$$\Delta C_t^{North} = \beta_1 + \beta_2 \Delta Y_t + \beta_3 \Delta r_{t-1} + \beta_4 FEXP_t + \beta_5 \hat{\varepsilon}_{t-1} + u_t \quad (4)$$

where C_t^{North} is of domestic household consumption in the North. The “ r_{t-1} ” term introduces the opportunity cost of consumption: this enters in the model as $r_{t-1} = 100 - [R_{t-1} - (P_t - P_{t-1})]$, where R_{t-1} is the nominal interest rate on one-year Italian Treasury bond, and P_t is the consumption good’s price index. $FEXP_t$ is the logarithm of tourists’ consumption expenditure,

¹³ The authors are glad to provide further details on the structure of the "SVIMEZ" model and/or computational procedures upon any request.

and $\hat{\varepsilon}_{t-1}$ are residuals taken from the long run consumption function. In the specification of consumption function for the South of Italy, the equation becomes:

$$\Delta C_t^{South} = \beta_1 + \beta_2 \Delta Y_t + \beta_3 \Delta r_{t-1} + \beta_4 \hat{\varepsilon}_{t-1} + u_t \quad (5)$$

The variable $FEXF_t$ for the South resulted in fact statistically not significant, and deleted in the final estimation, suggesting that tourism has a negligible effect on southern demand for consumption.

Considering now the investment function, we analyze separately the factors influencing investment demand for machinery (I^K), and residential and non-residential buildings (I^B). For the North of Italy we specify machinery investment functions:

$$\begin{aligned} \Delta I_t^{K-North} = & \alpha_1 + \alpha_2 \Delta AD_t + \alpha_3 EBITDA_{t-1} + \alpha_4 i_{t-1} + \\ & + \alpha_5 \Delta MA(3)UPC_t + \alpha_6 \Delta Bank_debt_t + v_t \end{aligned} \quad (6)$$

where $I_t^{K-North}$ is the log of investment on physical capital goods, AD_t is the log of aggregate demand, $EBITDA_t$ is the enterprises' gross operating margin, i_{t-1} is the rate of interest relevant for firms (the price of credit), $MA(3)UPC_t$ is a three-year moving average of rate of utilization of productive capacity¹⁴, and $Bank_debt_t$ is the logarithm of total volume of credit from banks to the firms. The specifications for the South of Italy and for the North of Italy of the investment function are broadly similar. The main difference is the inclusion as exogenous variable of public investments in the Southern Italy, since this plays a crucial role in supporting the capital accumulation process there. We then specify investment function in residential and non-residential buildings¹⁵ for the North and South of Italy as follows:

$$\Delta I_t^B = \rho_1 + \rho_2 \Delta AD_t + \rho_3 \Delta PI_t + \rho_4 MA(3)W_{t-1} + \mu_t \quad (8)$$

where PI_t is infrastructural/public capital spending (such as public buildings, transport infrastructure), and W_{t-1} is the rate on mortgage loans.¹⁶

The supply-side

The factors acting on aggregate supply capability are considered in the model as fundamental drivers of the long run growth of GDP. The theoretical frame of our supply function follows a "Kaldorian" inspiration. Thus, we model potential output along a Kaldorian "Technical progress function" (PANICCIÀ *et al.*, 2013) defined as:

$$\Delta y_t = a + b \Delta k_t + c \Delta y_t + LR_{un_{t-1}} \quad (9)$$

¹⁴ Plant utilization, in percentage points. ISTAT.

¹⁵ Includes buildings and constructions. ISTAT.

¹⁶ Note that that there is a MA(3) process on mortgage loans.

where y_t is the logarithm of GDP per worked hours, k_t is the logarithm of capital/labor ratio, and $LRun_{t-1}$ is defined as the residual of the long-run relationship $\log(y) - (a + b \log(k))$. This latter can be interpreted as the “height” and “slope” of a Kaldorian relationship, separately estimated for the two areas, to reflect the different capabilities of the Northern and Southern economies to absorb potential technical progress¹⁷. The variable k , (capital-intensity), in logarithmic differences, approximates for the effect of productivity improvement linked to process and organizational innovations, when capital-deepening occurs. The output variations aim at capturing the short-run impact on productivity of the variations in demand (i.e. the so-called Verdoorn effects)¹⁸.

¹⁷ See PANICCIÀ *et al.* (2011) for an in depth discussion of the absorptive capability of technical progress.

¹⁸ Note that the specification (9) uses log-differences to overcome the well-known problem of the bias in the estimation (see MCCOMBIE and ROBERTS, 2007).