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European I Department

**Regional Income Redistribution and Risk Sharing:
How Does Italy Compare in Europe?**

Prepared by Jörg Decressin¹

Authorized for distribution by Thomas Krueger

September 1999

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Abstract

This paper investigates income redistribution and risk sharing among Italy's regions and the implications for public policy. Using a richer data set than in previous works, this study allows for an assessment of public consumption's and investment's roles. The findings suggest that Italy's fiscal system provides interregional redistribution at 30–35 percent and risk sharing at 20–30 percent of GDP, mainly through public consumption. Compared with results in the literature for other European countries, there appears to be less redistribution and risk sharing in Italy through its welfare and tax systems because of their different structures.

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I. INTRODUCTION

This paper investigates regional public policy, redistribution, and risk sharing in Italy and compares its findings against evidence available for other countries. The issue of regional public policy is of particular relevance to Italy, because its regional economic contrasts are considerably more pronounced than in other advanced economies. Consequently, the question arises whether there is commensurately more interregional redistribution or risk sharing. Another interesting issue is how this is achieved: while redistribution to alleviate regional disparities in incomes and forestall inequalities in publicly provided services is a well-known feature of the present system of public finance in Italy, its modalities are anything but transparent.

Regional public policy is likely to remain high on policymakers' agenda even as Europe's integration proceeds. In fact, unlike across countries, there has been little convergence in per capita incomes across regions within European Union (EU) countries. The table below exhibits the ratio of the standard deviation of regional per capita GDP to the (unweighted) average thereof.² It also shows the same for the EU as a whole, with the countries taking on the role of regions. Interregional discrepancies in per capita incomes are larger in Italy than west Germany, France, and the United Kingdom, particularly once the distorting "city regions" are removed from the country panels.³ Also, while there has not been a systematic and sizable narrowing of interregional discrepancies within countries over the last decade, except for Germany's east, upon removing the "city country" Luxembourg from the EU sample, it is clear that there has been a marked reduction in intercountry per capita income divergences.

Turning back to Italy, the design of its system of regional public finance reflects to an important extent the regional dimension of its economic challenges. Against the backdrop of large differences in regional per capita income and thus fiscal revenue, state transfers are to ensure relatively uniform expenditure per capita among the regions, while there are legal limits on the contracting of debt by regions. Further characteristics of the system are the virtual absence of any scope for region-specific fiscal revenue policies and, regardless of regions' incomes, a shortfall of regional own revenues relative to expenditure mandates. The state transfers to regions that cover the shortfalls are set annually in the context of the budget.

²The regional disaggregation is EUROSTAT's so-called NUTS1 level. At that level, Italy comprises 11 regions, Germany 16 regions, France 8 regions (excluding the overseas departments), and the United Kingdom 12 regions.

³The "city regions" are Berlin, Bremen, and Hamburg for west Germany, Ile de France (Paris) for France, and London for the United Kingdom. The presence of "city regions," and thus income divergences because of agglomeration, are due to the NUTS disaggregation prepared by EUROSTAT reflecting, to the extent possible, the setup of regional government in the countries. Only for Italy, does this not lead to "city regions" within the sample.

There is no transparent formula for transfers, instead they are determined in a bargaining process and are largely a function of regions' financing requirements and history. Thrifty regions are thus penalized, while regions that overspend relative to own revenues and transfers have seen their liabilities cleared periodically by the state. Not surprisingly, this system has given rise to a number of inefficiencies which, in turn, have strained the solidarity among Italy's regions, have acted as a brake on fiscal adjustment at the national level, and have undermined the system's intended redistributive properties.

**Coefficient of Variation of Regional Per Capita Income
(In percent)**

Country	1996	1991	1987
Italy	26.6	23.5	24.7
Germany	35.0	48.1	...
Of which: west	23.0	21.6	20.2
excluding city states	14.3	12.9	11.3
France	23.4	23.2	22.7
excluding Paris	4.5	5.1	4.8
United Kingdom	15.6
excluding London	7.7	6.9	6.9
European Union	32.0	30.7	36.1
excluding Luxembourg	28.5	31.1	35.4

Sources: EUROSTAT, IMF (for EU), and author's calculations.
For EU sample, countries are considered rather than regions.

Accordingly, a key objective of the paper is to estimate how much redistribution of public resources and how much risk sharing there is between Italy's 20 regions. It compares its findings against evidence for France, the United Kingdom, and the United States. Furthermore, focusing on the European economies, the paper reflects on how the results are driven by differences in the size and structure of government.

The paper relies on a more comprehensive data set than previous studies which allows a broader definition of redistribution and risk sharing. In particular, the data allocate all operations carried out by the central administration in Italy, including consumption and investment, across the regions. Previous studies tended to focus on tax, contribution, and transfer payments and inferred the relation between disposable income and total income: the smaller the variations in disposable income for given variations in total income, the larger were redistribution (when levels were analyzed) or risk sharing (when growth rates were studied). While this approach yields easily interpretable results, it omits the role of government in determining income in the first place, through expenditure on public consumption and investment. The omission of public consumption, however, can have an important bearing on

the results for redistribution and risk sharing through the fiscal apparatus for several reasons. Its size is large, amounting to between 17 percent of GDP (United States) and 21 percent of GDP (United Kingdom) on average during 1980–95 in the countries reviewed; it is more similar across countries than expenditure on transfers (excluding interest), which varies between some 8 percent of GDP (United States) and 27 percent of GDP (France) over the same period; and, the bulk of public consumption is wages and salaries of public employees, an item that varies little over the economic cycle: considering its size, it should have an important stabilizing effect on regional incomes. Thus, after following the approach of measuring redistribution and risk sharing in the previous literature, the paper will adopt a broader and conceptually somewhat different definition thereof: a definition which considers the relation between regional income and regional income net of the primary fiscal balance, rather than net of the sum of tax and contribution payments less transfer receipts. Moreover, the paper will conjecture how redistribution and risk sharing would look in other countries under this broader definition.

Following the approach of the previous literature, the paper finds that interregional redistribution through personal income taxes, transfer payments, and social security contributions is equivalent to some 20 percent of household income in Italy. While this figure is at the high end of estimates for the United States, it is lower than the comparable figures for the United Kingdom and France. Risk sharing under this approach is equivalent to less than 10 percent of personal income, which is lower than the levels suggested by comparable evidence for the United States, France, and the United Kingdom. Adopting the broader definition discussed above, which also considers public consumption and investment, the paper finds redistribution on the order of 30–35 percent and risk sharing equivalent to 20–30 percent of GDP in Italy, with public consumption playing the largest role.

The paper is organized as follows. Section II reviews the literature on regional fiscal policy and explains the data which are examined in the empirical work of this paper. Section III explains the econometric model underlying the analysis. Section IV discusses the results of the estimations and Section V concludes.

II. LITERATURE REVIEW AND DATA ISSUES

A. Literature Review

The literature has examined the relation between regional fiscal policy and economic developments mostly in the context of currency unions. Two strands of work can be distinguished. At the theoretical level, the attention has focused on the design of risk sharing or redistributive schemes.⁴ The empirical literature, by contrast, has analyzed risk sharing and

⁴For example, Persson and Tabellini (1996a) study the moral hazard problems raised by interregional risk-sharing schemes in fiscal federations, while Persson and Tabellini (1996b)

(continued...)

redistribution within existing currency unions and drawn inferences for the risk sharing among European Economic and Monetary Union (EMU) member countries. This strand of research focuses largely on the United States and typically finds that about 10–15 percent of a shock to a state's product is absorbed by the federal government through lower taxes and higher transfers.⁵ It also finds long-run redistribution between the states of the United States of a similar order.⁶ For risk sharing and redistribution within EMU member countries, only a few econometric studies are available. Mélitz and Zumer (1998) focus on shocks to regional personal income and find that risk sharing between regions in France or in the United Kingdom is of a similar magnitude as between the states of the United States. Redistribution, however, is about twice as large in France (38 percent) and 50 percent larger in the United Kingdom (26 percent) than in the United States. Italianer and Pisani-Ferry (1992), using a simulations-based approach with parameter estimates drawn from macroeconomic models, find more than twice as much risk sharing in France and Germany (37 percent and 42 percent, respectively) than in the United States (17 percent); they do not investigate redistribution.

In terms of the econometric approach, the closest antecedent to this paper is Obstfeld and Peri (1998). They specify a bivariate Vector Autoregression (VAR) comprising regional per capita personal income and regional per capita available personal income, defined as per capita personal income less tax outflows from the region and including transfer inflows. Both variables are specified in terms of deviations from national average. The extent to which

⁴(...continued)

focus on the political and economic determinants of transfer schemes to share risk. Buchanan and Faith (1987) and Bolton and Roland (1997) address issues of regional redistribution, rather than risk sharing, under the threat of secession.

⁵Research that finds risk sharing broadly in the range of 10–15 percent of gross state product includes von Hagen (1992), Italianer and Pisani-Ferry (1992), Asdrubali and others (1996), and Mélitz and Zumer (1998). By contrast, focusing on regional personal income rather than gross state income, Sala-i-Martin and Sachs (1992) as well as Bayoumi and Masson (1996) find that the stabilization effects of the United States' federal system are larger and amount to about 40 percent according to the former, and 30 percent according to the latter. In the case of Sala-i-Martin and Sachs (1992), the higher result captures two distinct effects, namely redistribution and insurance, and therefore is not comparable to the other research. Note that Mélitz and Zumer also investigate personal income rather than gross state product: with personal income they find risk sharing at 20 percent (the higher figure is not surprising, considering that gross state product exceeds personal income and that fiscal systems usually do not redistribute nonpersonal income).

⁶Goodhart and Smith (1993) find redistribution in the vicinity of 10 percent of gross state product, while Mélitz and Zumer (1998) find a figure of 14 percent. Bayoumi and Masson (1996) see redistribution at 22 percent of household disposable income. By contrast, von Hagen (1992) finds redistribution of up to 47 percent of gross state product.

available income reacts to a shock to personal income provides an indication of the stabilizing role of government. In analyzing this system for the United States, they obtain results broadly consistent with previous evidence (10 percent stabilization and 20 percent redistribution). Surprisingly, for Italy, they find hardly any stabilizing role over the period 1979–93, although this result could have been driven by data problems. In fact, the authors could focus only on the social insurance system, noting that it provides a very partial picture of total fiscal flows.

B. Data and Related Issues

The data comprise, for Italy's 20 regions, aggregate economic accounts (1970, 1980–1995) and accounts for public administrations (1983–92), as well as data on new public works initiated (1970–95), all compiled by the *Istituto Nazionale di Statistica* (ISTAT).⁷ On the basis of population size, the resulting sample is more homogeneous than the sample of the 50 states of the United States which has been the object of analysis in a number of similar studies.⁸ In terms of population shares, the four largest regions in 1995 were, by a considerable margin, Lombardia (15.4 percent), Campania (10.3 percent), Sicily (9.1 percent), and Lazio (9.0 percent).

The data allocate all operations carried out by the central administration in Italy, as each region is treated as if it were a separate economy with its own public administration, the constraint being that the data for the various variables of the regions have to add up to the national, general government data for those variables (see Appendix I). Previous studies tended to focus on tax, contribution, and transfer payments. This raises two important issues. First, in the absence of regional data on government spending on employment, procurement, or investment, the role of government expenditure in redistribution and risk sharing could not be analyzed in previous work—for a similar reason, the role of indirect taxes or corporate welfare was often neglected.⁹ Accordingly, after taking the approach of measuring redistribution and risk sharing of the previous literature, the paper will adopt a broader and conceptually somewhat different definition thereof: a definition which considers the relation

⁷Within the classification system of EUROSTAT, the regional decomposition reflects the NUTS2 level.

⁸In 1987, the average region in Italy counted about 2.9 million inhabitants, the standard deviation equaled about 2.2 million inhabitants, and the coefficient of variation reached 0.78. In the same year, for the states of the United States, the average population was about 4.8 million, the standard deviation 5.2 million, and the coefficient of variation 1.08.

⁹Furthermore, in the data set used in this study, the allocation of operations involving the central government is based on evidence in surveys conducted for the compilation of the national income accounts. Absent such data, previous research had to rely on constructions of tax and contribution payments by corporations, based, for example, on national data and the regions' shares in personal income.

between regional income and regional income net of the government primary balance.¹⁰ Second, this paper focuses on the role of the general government rather than the central government in addressing regional imbalances.¹¹ This does not affect the comparability of the results obtained from the traditional approach to measuring redistribution and risk sharing, as the room for region-specific revenue or welfare policy initiatives was negligible. Once the paper moves to the broader definition, it may ascribe some risk sharing to the public finance system instead of to the credit markets but the resulting error is likely to be small: while there was some room for regional initiative in expenditure, it was circumscribed by the amount of transfers that could be expected from the center and limits on borrowing by regions.¹² In fact, the share of noncentral government interest expenditure in total government interest expenditure is less than 5 percent.

III. THE ECONOMETRIC MODEL

This study focuses on region-specific economic developments and their effect on fiscal policy. A region-specific variable is defined as:

$$x_{it} = \log(X_{it}) - \log(X_{Itat}), \quad (1)$$

where \log denotes the natural logarithm, X_i is the variable under study of region i , X_{Ita} is the same variable for Italy, with both defined in real (1990 lire (Lit)), per capita terms—here, as well as subsequently, upper case letters denote levels of variables under study, while lower case letters denote natural logarithms of relative variables, as defined in equation (1).¹³ To investigate the joint behavior of regional per capita real GDP and the various fiscal variables, the bivariate VAR displayed in equations (2) and (3) below is run for regional relative per capita real GDP (gdp) and the particular regional relative per capita fiscal variable ($fiscal$), both defined as explained in equation (1):

¹⁰Interest expenditure is not considered because more than 95 percent of it is borne by the central government and the procedure according to which it is allocated across regions in the ISTAT accounts is based largely on assumptions rather than hard data (see Appendix I).

¹¹Méltz and Zumer (1998) do the same for their estimates for France and the United Kingdom against which the results for Italy obtained here are compared.

¹²Admittedly, such limits were not strictly enforced on the local spending units of which the health units are by far the most important. Mapelli (1999) estimates that during 1980–97, the health units accumulated 1995 Lit 147 trillion in debt and payments arrears, or the equivalent of about 8½ percent of 1995 GDP. However, these were largely cleared by the central government in eight operations.

¹³Real variables are computed using the regions' GDP deflators.

$$gdp_{it} = \alpha_{i10} + \beta_{11}(L)gdp_{it-1} + \beta_{12}(L)fiscal_{it} + \epsilon_{i1t} \quad (2)$$

$$fiscal_{it} = \alpha_{i20} + \beta_{21}(L)gdp_{it} + \beta_{22}(L)fiscal_{it-1} + \epsilon_{i2t} \quad (3)$$

where L denotes the lag operator. In this VAR, *fiscal* can stand for several variables. If the traditional approach to measuring redistribution and risk sharing is followed, *fiscal* denotes the relative *sum of personal tax and contributions payments net of transfer receipts* (moreover, in this particular instance only does *gdp* stand for per capita regional relative household income rather than GDP). Under the broader, conceptually different measure *fiscal* stands for the relative *primary balance*.¹⁴ Region-specific fixed effects are allowed for because the results of a regression of the level of regional real GDP in 1990–95 on that in 1970–75 suggest no convergence in incomes over the last generation (Figure 1).

To investigate the (impulse) response of fiscal policy to region-specific shocks to economic activity (the “short-run” fiscal elasticities) it is necessary to identify these shocks. The working prior is that innovations in *gdp* unrelated to past changes in *gdp* and the *fiscal* variable under study precede innovations in the *fiscal* variable, for example, because the GDP innovations reflect innovations in a region’s terms of trade. Accordingly, in the system of equations (2) and (3), *gdp* is ordered first and *fiscal* second. This assumption has typically been made in the literature.¹⁵ To analyze the relation between fiscal policy and long-term interregional GDP discrepancies (the “steady-state” fiscal elasticities), the steady-state values for each region’s *gdp* and *fiscal* are recovered from the region-specific constants and the parameter estimates of (2) and (3), upon setting equal contemporary and lagged values. Then the relationships are obtained from regressions of the various regions’ steady state *fiscal* values on their steady state *gdp* values. In what follows, these “steady-state” fiscal elasticities are related to interregional redistribution and are discussed first. The response of fiscal variables to shocks and thus the “short-run” fiscal elasticities are linked to risk sharing and are presented later.

¹⁴For the government *primary balance* or the *sum of personal tax and contributions payments net of transfers*, the natural logarithms are dropped from equation (1). For both of these fiscal variables semi-elasticities with respect to income or GDP, respectively, are thus computed.

¹⁵See, for example, Bayoumi and Masson (1993), Asdrubali and others (1996), Obstfeld and Peri (1998), and Méritz and Zumer (1998). For an alternative approach see Sachs and Sala-i-Martin (1992). Note that there was basically no scope for region-specific fiscal revenue policy in Italy during the period under investigation. Similarly, the scope for (both personal and corporate) welfare initiatives at the regional level was very limited. While there was more room for discretionary action in regard to public consumption and investment, the ordering turned out to have had no bearing on the regression results for (2) and (3).

How are the amounts of redistribution and risk sharing obtained from the results of fitting equations (2) and (3)? The paper argues that there is redistribution if the differences in per capita incomes are lower after the influence of fiscal flows than before. Similarly, there is risk sharing if the percentage change in per capita incomes in response to an economic shock after the influence of fiscal flows is lower than before. In the traditional approach to measuring redistribution and risk sharing, the per capita incomes after the influence of fiscal flows are defined as disposable household income (income less the *sum of personal tax and contributions payments net of transfer receipts*). With the help of the “steady-state” or “short run” fiscal elasticities it is straightforward to calculate the “steady-state” or “short run” elasticities (E_I^{DI}) of disposable household income (DI) with respect to household income (I): measures R of redistribution or risk sharing are defined as $E_I^{DI}-1$, depending on whether the elasticity is, respectively, “steady-state” or “short run”. For the broader, conceptually different measures of redistribution and risk sharing, the same is done for the elasticity of *GDP-primary balance* with respect to *GDP*. For this latter concept of redistribution and risk sharing an alternative measure of R builds on the $j=1, \dots, m$, revenue or expenditure elasticities E_j with respect to *GDP* obtained from running (2) and (3), with *fiscal* denoting in turn each of $j=1, \dots, m$, revenue and expenditure categories that sum to the *primary balance*:

$$R = \frac{\sum_{j=1}^m (1-E_j) \frac{FISCAL_j}{GDP}}{1 - \frac{\sum_{j=1}^m FISCAL_j}{GDP}}, \quad (4)$$

where *GDP* now denotes average per capita *GDP* and $FISCAL_j$ the average per capita value of the j -th revenue (positive value) or expenditure (negative value) category. The averages are taken over all regions and time periods.

Following Bayoumi and Masson (1995), the approximate contribution C_j of each expenditure and revenue category to redistribution or risk sharing is determined by computing how R changes as it is calculated for $m=1, m=2, \dots$, that is, as one fiscal category is fed into the calculation of R after another. From (4) it can be shown that for an expenditure or revenue category to contribute to redistribution (or risk sharing), the expenditure- and revenue-to-*GDP* ratios need to be higher (rise) and lower (fall), respectively, in poorer regions (region-specific recessions). Thus, if, for example, expenditure was equal across regions with different levels of income (constant in response to region-specific shocks) and revenue a fixed proportion of income (changing by the same percentage amount as income in response to shocks), all the redistribution (risk sharing) would be allocated to expenditure.

Note that part of the early literature has adopted a different definition for the contribution of the various expenditure and revenue categories to redistribution and risk sharing. According to that definition, the C_j are given by

$$C_j = \frac{\Delta FISCAL_j}{\Delta PRIMARY BALANCE} \quad (5)$$

This definition of C_j implies that if, for example, expenditure is equal across regions with different levels of income (constant in response to region-specific shocks) and revenue a fixed proportion of income (changing by the same percentage amount as income in response to shocks), all the redistribution (risk sharing) would be allocated to revenue. The respective assignment to expenditure and revenue is exactly the opposite of the definition adopted in this paper. However, it seems more natural to associate redistribution with progressive rather than proportional taxation and risk sharing with tax payments that, rather than mirroring exactly a region's cyclical position relative to the country, rise (fall) by more than a region's income in regional booms (recessions). Similarly, considering that one of the largest components of welfare benefits is for retirement and that retirement benefits are positively related to contributions, it would appear more natural to associate redistribution with welfare benefits that are higher as a share of income in poorer states. Accordingly, the definition for C_j adopted here is that implicit in (4). Adopting this definition has the added advantage of making the results comparable to those of recent research for other European countries.

Note that it is not possible to assess whether there is a significant amount of risk-sharing simply by observing the impulse responses of the system of equations (2) and (3), because they relate income with fiscal flows rather than income with income adjusted for the fiscal flows. To check for significance, the paper replaces the variable *fiscal* with *fiscal-gdp* in the system of (2) and (3). For the primary balance and analogously, for *the sum of personal income taxes and social contributions net of transfer receipts*, *fiscal* is replaced with:¹⁶

$$\log\left(\frac{GDP_{it} - PRIMARY BALANCE_{it}}{GDP_{Itat} - PRIMARY BALANCE_{Itat}}\right) - gdp \quad (6)$$

¹⁶Note it would have been possible to calculate redistribution and risk sharing with these regressions and drop the regressions as specified in equations (2) and (3). However, disentangling the fiscal variables and GDP makes it easier to assess whether the results obtained are sensible: clearly if taxes were to decline in response to a boom, the results would be suspicious. However, this cannot be seen if ratios to GDP are being analyzed (which is what is done in replacing *fiscal* with *fiscal-gdp* in equations (2) and (3)), as the tax to GDP ratio could well decline if revenues are not buoyant in the short run. Also, there is a literature estimating revenue elasticities based on aggregate data for Italy, against which the results obtained here can be compared and evaluated.

IV. THE RESULTS

A. Redistribution

According to the approach followed here, the fiscal system redistributes income between regions if expenditure has a larger and revenue a lower weight in poorer regions' income. The summary statistics in Table 1 suggest that there are wide discrepancies in per capita real GDP between regions and similarly in fiscal revenue. On the other hand, per capita public consumption, public works, and capital expenditure tend to be fairly uniform, and welfare spending lower in the poorer regions.

The traditional measure

The traditional measure of redistribution focuses on the relation between household income and disposable income. After running the system of equations (2) and (3) with *fiscal* set equal to the difference between these two variables, namely the *sum of personal income taxes and social contributions net of transfer payments*, and setting *gdp* equal to relative per capita household income, the steady-state values obtained are those in Figure 2.¹⁷ They suggest that a region with a 10 percent higher per capita household income, or by about 1990 Lit 1.8 million, pays lire 0.45 million more in taxes and contributions than it receives in welfare benefits: the exact calculations suggest redistribution on the order of somewhat less than 20 percent of household income (Table 2, Source A).

How does this result compare with that for other countries? The results for the United States suggest redistribution on the order of 10–15 percent of gross state product 15–20 percent of household income. Research for the United Kingdom and France by Mélitz and Zumer (1998) reveals respective redistribution on the order of 26 and 38 percent of regional personal income. Overall, redistribution in Italy thus appears at the high end of estimates for the United States, but lower than in the United Kingdom, and considerably lower than in France.

The broader concept

Rationalizing the previous result requires investigating the behavior of individual expenditure and revenue categories. This section analyzes the response of the expenditure and revenue categories covered under the traditional measure of redistribution; in addition, it does the same for expenditure categories that were previously ignored, notably public consumption and investment. With the help of the latter, the section characterizes redistribution under the broader, conceptually somewhat different measure which focuses on *GDP-primary balance* rather than household disposable income.

¹⁷Note that given the short sample period, the results should be interpreted cautiously as characterizing steady-state redistribution.

The poorest region (Calabria (CL)) has less than half the per capita GDP of the richest region (Lombardia (LO)), yet affords a higher level of per capita public consumption (Table 1). Figure 3 plots the steady-state levels of relative regional public consumption and relative real GDP obtained from fitting equations (2) and (3) with *fiscal* set equal to relative public consumption. Different levels of economic development, which one would suspect to give rise to different requirements for government services, are hardly reflected in a different provision of such services. Some of the country's richest regions (Piemonte (PI) and Lombardia (LO)) afford the lowest per capita volume of public consumption. While this may partly be related to their larger-than-average size, poorer regions with a similar or larger population (Campania (CM) and Sicilia (SIC)) afford more consumption. In fact, while per capita employment in nonmarketable services is similar, wages are higher in the public sector of the poorer regions (Table 1).¹⁸ There is no compelling evidence that higher pay or seniority has prompted more efficient public service.¹⁹ Turning to public works, the data in Table 1 and the evidence in Figure 4 make no case for government programs having been directed to poorer regions.

Regarding transfer spending, a positive relationship between social spending and income emerges, as could have been expected since old age and survivors' pensions account for about 60 percent of social expenditure and benefits for invalidity and occupational injuries for another 10 percent (Figure 5)—such benefits are income and age related and thus naturally higher in the richer regions, which also happen to have an older population. In addition, some 20 percent of welfare spending is for health, another age-related expenditure.²⁰ Inefficiencies in the health system distort its intended redistributive properties. Mapelli (1999) finds that the redistribution through the national health fund is dwarfed by the unbudgeted expenditure by health care spending units which is periodically taken over by the state: the worst offenders

¹⁸Obtaining the steady-state values of per capita public employment and running a regression as in Figure 2 but with relative employment on the horizontal axis, it turns out that there is no relation between income and the amount of public employment upon adjusting for the special case of Lazio (LZ) (which includes the capital Rome) and for two small, so-called "special" northern regions (TAA and Friuli Venezia Giulia (FVG)). However, doing the same regression for relative wages reveals a line with a negative slope of 0.08 and an R^2 of 0.2. One reason for the higher wages in the south is that their public employees, particularly the teachers, tend to be more experienced. Often, they initially find employment in the north and, after having acquired the right to transfer after a certain number of years in service, ask to be allocated a position in the south. Similar considerations apply to the police and other services.

¹⁹Evidence in SVIMEZ (1998) indicates a lower degree of satisfaction with public services in the poorer regions. Also, IMF reports indicate that while the poorer regions in the south employ over 30 percent of tax administration staff, they account for less than 10 percent of revenue collected.

²⁰Note that as health benefits are provided in kind, they could be larger in richer regions owing to higher relative prices.

on that account were the regions in the northeast and the center, while those of the south performed best.²¹ Moreover, Italy (together with Greece) is the only EU country without a national scheme of residual protection for the poor who are not eligible for any standard benefits and lack a sufficient record of participation in formal employment (Rostagno and Utili, 1998).²² Overall, although positive, the relationship between welfare expenditure and income is significantly less than one-for-one at a 95 percent confidence level and thus the welfare system imparts a measure of equalization. Concerning transfers to firms (Figure 6), on account of the many programs to foster investment in depressed areas, their relation to income is substantially less than one-for-one.

Tax revenue and social security contributions vary widely across regions. Reflecting the progressiveness of the national tax system, tax and contribution breaks to foster activity in depressed areas, and the larger size of the underground economy,²³ the revenue effort as measured by the ratio of revenue to per capita GDP in Table 1 is lower in the poorer regions. This is also evinced by the fact that the parameter estimate of the regression line through the steady-state revenue values in Figure 7 exceeds unity significantly.²⁴

A relatively uniform level of public spending on consumption together with, in the poorer regions, a similar public works effort and lower revenue cause considerable fiscal imbalances (Table 1). The steady-state values in Figure 8 suggest that a region with a per capita income that exceeds the national average by 10 percent during 1983–92—equivalent to about 1990 Lit 2.1 million during 1983–92—records a Lit 0.65 million higher per capita primary balance. Given that local government debt amounts to a fraction of national debt, it is assumed that the imbalances are entirely met by transfers.

²¹In the south, the average unbudgeted expenditure accumulated per capita during 1980–97 amounted to about 80 percent of the national average. Had it been similar to the level in the northeast or center, the southern spending units would have received additional resources from the central government equivalent to more than five times the net receipts from the national health fund. Accordingly, unbudgeted health expenditure more than offsets the redistribution through the national health fund.

²²In 1998, a very limited social assistance program targeted at the poor was introduced on a pilot basis.

²³SVIMEZ (1998) estimates that irregular labor units (excluding those holding a second job which is irregular) amounted to 13 percent of all labor units in the north, while in the south the figures reached 33 percent, with a peak of 42 percent in Calabria. The national income accounts are adjusted to reflect irregular activity.

²⁴The critical value for the parameter estimate is 1.04 at the 95 percent significance level.

Considering this evidence, Table 2 quantifies the amount of redistribution through the fiscal system using different data sources and functional specifications. Source B uses the data underlying Figures 3–7. Source C does the same but for a smaller number of broader revenue and expenditure components, the data for which come only from the public administrations accounts. Source D uses public administration account data on the primary balance directly, rather than on its components, and thus imposes the restriction that its individual revenue and expenditure components respond identically to income differences—it computes redistribution based on the regression shown in Figure 8 and based on a similar regression obtained from the system of equations (2) and (3), estimated with $L=2$ rather than $L=1$.

Regardless of the data sources and functional specifications, the results suggest redistribution in the range of 30–35 percent of regional GDP, as compared to some 20 percent of personal income under the traditional approach. Broadening the measure of redistribution thus makes a major difference. Public consumption accounts for about 40 percent of redistribution, the same amount as the fiscal revenue system. By contrast, the welfare system contributes less than 15 percent. Total public works or capital spending, which comprise expenditure by the famous agency for the development of the south (the former *Agenzia per il Mezzogiorno*) make little difference for redistribution, partly owing to their small size.

Returning to the traditional approach to measuring redistribution, the results for Italy may appear surprising if compared with those for France and the United Kingdom, considering the marked regional inequalities. As mentioned previously, a key issue here is the low contribution of welfare spending to redistribution. It probably reflects a comparatively low level of expenditure on social protection upon excluding old age and survivor benefits: in 1994, such expenditure was equivalent to 9.8 percent of GDP in Italy, while in France and the United Kingdom it amounted to 17.9 percent and 16.8 percent of GDP, respectively.²⁵ Moreover, although Italy's tax system is characterized by high marginal tax rates, during 1983–92 the average tax rate, as approximated by the ratio of total primary revenue to GDP (40.6 percent), was not much out of line with that in the United Kingdom (38.8 percent), and considerably below that in France (48.8 percent). One way to interpret the results from the broader concept of redistribution would be that the public sector in Italy, by affording similar consumption in the poorer regions as in the richer ones, makes up for deficiencies in the Italian welfare system relative to those in the United Kingdom and France. On the other hand, if the United Kingdom and France were following a similar public consumption expenditure policy as Italy, that is, one of fairly uniform per capita spending across regions— a supposition that is not unreasonable given the markedly smaller interregional economic discrepancies in these countries— then public consumption would account for a similar absolute amount but a lower share of redistribution than in Italy. The reason is that the two countries spend almost the

²⁵See Rostagno and Utili (1998). Moro (1994), analyzing 1991 regional data, notes that the higher expenditure on subsidies and capital that stems from special programs fostering the development in the south does not offset the lower welfare expenditure. She considers the government's redistributive intervention is weak and contradictory.

same share of GDP on public consumption as Italy.²⁶ Estimates of redistribution for France and the United Kingdom would thus be some 10–15 percentage points of GDP higher than under the traditional approach, reaching perhaps some 35 percent of GDP in the United Kingdom and some 45 percent in France.²⁷ However, this is a highly speculative reasoning and robust conclusions on this issue will have to await further research.

Before proceeding to the investigation of risk sharing, it is worth exploring whether there are any reasons to believe that redistribution may have changed since 1992, the end of most of the data used in this paper for Italy but the beginning of an important fiscal adjustment in the country. Other data suggest that redistribution likely has declined since 1992 because of changes in welfare benefits and taxation. The evidence suggests that as per capita income in the poorer, southern regions fell relative to that of the country since 1992, the share of public consumption in GDP rose considerably (Table 3). Nevertheless, the share of primary current expenditure in GDP remained unchanged, owing to offsetting developments in welfare benefits. A fall in relative capital expenditure in the wake of bribery scandals, by about three-fourths of 1 percentage point, caused the share of total primary expenditure in GDP in the south to decline relative to the country. In addition, the relative tax and contribution burden in the south appears to have risen, because of a shift from direct to indirect taxation as well as improvements in tracking and taxing underground activity which is more widespread in the south.²⁸

B. Risk Sharing

The regional fiscal system shares risk if expenditure and revenue buffer the effects of economic shocks on a region's income. During 1980–95, region-specific economic shocks

²⁶During 1980–95, Italy spent about 18 percent of GDP on public consumption, while France and the United Kingdom spent about 19 and 21 percent, respectively.

²⁷This assumes that redistribution of 26 percent and 38 percent of regional personal income in the United Kingdom and France, respectively, translates into redistribution of some 22 percent and 32 percent of regional GDP, respectively. This would be reasonable if personal disposable income was equivalent to some 80–85 percent of GDP (a range which is likely to comprise the true figure), and there was no redistribution through indirect and corporate taxes (this is likely to be the case) as well as firm subsidies (while these are likely to be redistributive, their amounts are comparably small).

²⁸During 1990–95, the share of indirect taxes in GDP rose from 10.6 percent to 11.8 percent, while that of direct taxes increased from 14.4 percent to 14.7 percent only. Upon replacing total fiscal revenue in Figure 7 with indirect tax revenue, the slope of the regression line drops to 0.97, suggesting that indirect taxes are modestly regressive.

typically altered a region's GDP by about 1.4 percent.²⁹ The responses of the policy variables to these shocks, obtained from fitting the system of equations (2) and (3), are displayed in Figures 9–15 and their contributions to risk sharing in Table 2. According to the definition adopted here, for there to be risk sharing, the response of *fiscal* in Figures 9–15 has to lie above or below that of *gdp*, if *fiscal* is a revenue or an expenditure category, respectively. The impulse responses which are surrounded by confidence intervals (the dotted lines) formally test whether the path of *fiscal-gdp* differs significantly from zero.³⁰ Given the short sample for most of the variables, the lag length in equations (2) and (3) was generally set at one, except for consumption and public works; the results with lag length two were fairly similar.³¹

The traditional measure

Setting *fiscal* equal to the *sum of personal income taxes and social contributions net of transfer payments*, and setting *gdp* equal to relative per capita household income, the results from running (2) and (3) suggest the typical shock raises household income by about 1990 lire 230,000 (1.3 percent) in the first period and by a cumulative 1990 lire 900,000 through period 5 (5.0 percent). Concurrently, the *sum of personal income taxes and social contributions net of transfer payments* increases by about 1990 lire 30,000 and 1990 lire 100,000, respectively. As a result, risk sharing amounts to about 5 percent of household income (Figure 9 and Table 2, Source A).

How do these results compare with those for the United States, the United Kingdom, and France? Recall that most studies estimate risk sharing in the United States in the vicinity of 10–15 percent of gross state product, which would be equivalent to some 15–20 percent of household personal income. For the United Kingdom and France, Mélitz and Zumer (1998)

²⁹This is the equivalent of a one standard error innovation in GDP in the estimated system of equations (2) and (3).

³⁰For the primary balance, the line represents the evolution of the variable as computed in equation (6) above.

³¹Furthermore, in estimating the system, the presence of a lagged dependent variable together with fixed effects potentially raises problems, considering the relatively short sample period. For the set of regressions presented below, one would typically expect a negative bias in the estimate for the lagged dependent variable, as the number of regions considered approaches infinity (Nickell, 1981). The procedure adopted in this paper was to check for the presence of such a bias, which need not be sizable considering the number of regions in the panel, in the ordinary least squares (OLS) estimates for β_{11} and β_{22} in equations (2) and (3) by comparing them against estimates obtained using an instrumental variables approach (IV)—the instruments for the explanatory variables having been the same variables lagged twice; this procedure should yield unbiased results (Hsiao, 1986). Evidence for a sizable (20 percent) downward bias could only be found for β_{22} in the case of fiscal revenue (and, by consequence, also for β_{21}). However, this turned out to have only a minor effect on the results for redistribution through the revenue system.

find risk sharing on the order of 20 percent of personal income. Accordingly, there seems to be considerably less risk sharing in Italy through the fiscal revenue and welfare system.

The broader concept

To rationalize the previous result, this section investigates the behavior of individual expenditure and revenue categories covered under the traditional measure as well as those covered under the broader concept of risk sharing. With the help of the latter, it evaluates risk sharing based on the broader concept.

Under the broader concept of risk sharing, public consumption, as in redistribution, plays the most prominent role by virtue of remaining broadly unchanged over the cycle (Figure 10). Regarding per capita public works, there is no strong evidence of a countercyclical expenditure policy at the regional level (Figure 11). With respect to transfers, firm subsidies drop as GDP rises (Figure 12); on the other hand, spending on welfare increases, albeit significantly less than one-for-one with GDP in the short run (Figure 13), thus imparting a measure of stability to income. Overall, depending on the data source and the lag-length chosen, primary expenditure offsets between 25–30 percent of the immediate effect of the regional GDP shock on income. Over time, however, the offset declines, reflecting the response of welfare spending. The positive and significant response of welfare spending to GDP is no longer surprising, considering the peculiarities of the Italian welfare system, including the preponderance of old age and survivors' benefits and a small unemployment insurance system.³² The increase in welfare spending may result from the relation between pensions and incomes in the final working years. In addition, although pensions are governed by national parameters, these parameters used to differ by sector until the 1992 pension reform. Until then, pensions were indexed to wages: a positive regional GDP shock in the econometric results here may reflect a preponderance of well-performing sectors at the national level to which higher wage increases were awarded. Moreover, welfare expenditure may rise in booms because in-kind health care benefits become more expensive.

Fiscal revenue does not contribute to stabilizing income (Figure 14). While per capita revenue rises noticeably in response to a positive regional shock to GDP, it rises by merely 0.4 percent, while income increases by 1.4 percent in the first period; after five years, the figures are, respectively, a cumulative 2.8 percent and 3.4 percent. Accordingly, the percentage change in income adjusted for revenue is larger than that of unadjusted income. In fact, the results suggest that it takes 10 years for the cumulative percentage change in

³²Comparing the generosity of various unemployment benefits systems, the OECD (1997a and 1997b) finds that the Italian system ranks, together with the United States, among the least generous within the OECD. The initial net replacement ratio in Italy is 42 percent but benefits last for merely six months. Unemployment benefit expenditure stood at 0.6 percent of GDP in 1994, as against 2.0 percent in Germany, 1.8 percent in France, and 1.6 percent of GDP in the United Kingdom (Rostagno and Utili, 1998).

revenue to match the change in real GDP. The failure of revenue to respond vigorously to GDP in the short run could be related to its structure as well as, possibly, to tax administration. The Italian revenue system is comparatively fragmented, with a large number of taxes. Particularly during the period of observation, a smaller share of Italy's fiscal receipts stemmed from revenue categories that react quickly to changes in economic activity, such as value added tax and social security.³³ Other tax categories that generate a larger share of revenue than elsewhere and typically react more slowly to the cycle include taxes on interest and mineral oil. The structure of revenue, in turn, could be a reflection of evasion on the more cyclically sensitive tax bases (notably income from independent labor and the VAT base) and thus tax administration problems. Another reason for the lower short-run sensitivity of revenues could be longer tax collection lags. Other than administrative problems, this could be a reflection of the relatively large share of independent workers' and corporate income in Italy: at over 30 percent, the share of independent workers equals almost three times the amount in France, the United Kingdom, and the United States. Lastly, reflecting rising tax evasion in booms, changes in declared income could be lower than in actual income.

With expenditure changing relatively little and revenues evolving procyclically, albeit less than one-for-one with income, the primary balance increases substantially in booms; thus, GDP adjusted for the primary balance as in equation (6) rises by less than raw GDP (Figure 15). Table 2 quantifies the amount of risk sharing through the fiscal system.³⁴ Almost all the results point to an improvement by about 1990 Lit 30,000 in period 1, with income rising by about 1990 Lit 250,000–300,000 (around 1.4 percent), putting the amount of risk sharing at about 10 percent. The results differ more over a five-year horizon, as expected given the short sample for many variables: per capita GDP rises between 1990 Lit 550,000–750,000 (2.6–3.5 percent) and the primary balance by between Lit 120,000–330,000. Depending on whether the primary balance is estimated as the sum of its components (Sources B and C) or independently (Source D) and whether the lag length chosen is one or two, all but one result suggest that the amount of risk sharing is broadly in the range of 20–30 percent of regional income. Public consumption plays by far the most important role both immediately and over the medium term. While transfer spending on individuals plays a considerably larger role in the short run than similar spending on firms, this is no longer the case after a few years. Overall, the results suggest that there is less risk sharing than redistribution in the public finance system, owing to the slow response of fiscal revenue to GDP and the gradual pickup of welfare spending in line with income.

³³However, for social security this is not true relative to the United Kingdom.

³⁴Source B uses the data sources and results underlying Figures 10–14; Source C uses the broader revenue and expenditure categories, the data for which come only from the public administrations accounts; and Source D computes risk sharing based on the results underlying Figure 15, that is, it computes the changes of the primary balance in response to shocks directly, rather than as the sum of changes of the primary balance's individual revenue and expenditure categories (as is done in Sources B and C).

Going back to the results under the traditional approach, the evidence here suggests that the reasons for the much lower level of risk sharing in Italy than in the France or the United Kingdom are the low elasticity of revenue with respect to output in the short run, estimated at about 0.3 here, and the gradual increase of welfare spending in the outer years.³⁵ A question is whether the conclusion would change upon considering public consumption for France and the United Kingdom. The answer is probably no. Recall that the bulk of this item relates to expenditure on wages and salaries which is unlikely to vary systematically and noticeably over the cycle. Assuming public consumption in France and the United Kingdom behaved as in Italy, it would provide for an equivalent amount of risk sharing, that is, some 15 percentage points of income, given that these countries' public consumption-to-GDP ratio is very close to Italy's. In terms of GDP, risk sharing in these two countries could then exceed 30 percent.³⁶ Of course, the weight of public consumption in risk sharing would be lower than in Italy.

V. CONCLUDING REMARKS AND POLICY IMPLICATIONS

Italy is an especially interesting case study for redistribution and risk sharing because of its large interregional economic disparities. The question that inevitably arises is whether there is commensurately more redistribution or risk sharing between regions in Italy than elsewhere. The paper investigates this question with the help of a richer data set than has been used in previous work. Following the traditional approach to estimating redistribution and risk sharing

³⁵This finding is consistent with Giorno and others (1995). They estimate that as Italy's output exceeds its "potential" level by 1 percentage point, income taxes and social security contributions during 1978-92 exceed their potential level by between 0.3 to 0.4 percent. The evidence here suggests that as a regions' output exceeds its average relative to national output by 1 percent, all the region's categories of revenues exceed their average relative to the country by about 0.3 percent. For the United States, the United Kingdom, France, and Germany, Giorno and others estimate income tax elasticities with respect to output in the range of 0.9 to 1.4 and social security contribution elasticities between 0.7 and 1. The relatively low elasticities for Italy reflect both lower elasticities of taxes and contributions with respect to incomes as well as a lower elasticity of the wage bill with respect to output. The counterpart of a lower elasticity of the wage bill should be a higher elasticity of profits in Italy. For corporate taxes, Giorno and others use a similar elasticity in Italy as in most of the other countries but note that reliable estimates for corporate taxes are difficult to obtain. For indirect taxes, they assume a unit elasticity with respect to output for all countries. Note that von Hagen (1992) finds a unit elasticity of income tax revenues with respect to output for the United States.

³⁶This calculation would provide a good approximation if personal disposable income was equivalent to about 80-85 percent of GDP in the two countries, which is unlikely to be far off the true figure, and there was no risk-sharing through indirect and corporate taxes (which is not an unreasonable assumption) as well as firm subsidies (these are small anyway).

which focuses on the relation between household income and disposable income, the paper finds redistribution on the order of 20 percent and risk sharing of about 5 percent of household income. Taking advantage of the richer data set to investigate redistribution and risk sharing under a new, broader concept which builds on the relation between GDP and GDP adjusted for the primary fiscal balance, the paper finds that interregional redistribution amounts to about 30–35 percent of GDP and that the fiscal system buffers about 20–30 percent of region-specific shocks to per capita GDP.

Public consumption plays the largest role, ensuring about 40 percent of redistribution and around two-thirds of risk sharing under the broader concept. Public works and capital spending, categories which have received considerable attention in the context of redistribution in Italy, contribute little to redistribution and risk sharing. While the tax system has an effect on redistribution which is comparable to that of public consumption, the welfare system plays a much smaller role. Regarding risk sharing, the welfare system plays a role similar to that of public consumption in the short run but it contributes little over the medium term. By contrast, the tax system exacerbates risk, owing to a low output elasticity of revenue over the short run.

In making comparisons with previous results in the literature for other countries, the paper needs to focus on the results obtained following the traditional approach. The results suggest there is less redistribution in Italy through the tax and welfare systems than in the United Kingdom and considerably less than in France. The same appears to be the case for risk sharing. The paper explains the results with the well-known peculiarities of the Italian welfare system—including the preponderance of pension expenditure in total welfare spending, the absence of a national safety net for the poor, and the very limited unemployment insurance scheme—as well as the existing evidence on the response of taxes to income at the national level.

Enhancing the risk-sharing properties of Italy's welfare system as well as of the fiscal revenue system, could be helped by the introduction of a broad-based, well-targeted unemployment insurance scheme. Also, changes in tax administration may be necessary, although here it is important to bear in mind that Italy's small and medium-sized industry sector is fairly sizable. Moreover, the country's employment structure is highly fragmented, with almost 30 percent self-employed, making tax administration relatively complex. Improvements in redistribution could be achieved, for example, through reforms of the national health system where the central government has repeatedly bailed out profligate regional health care spending units, most of which are located in richer regions. This would have the added benefit of fostering better management.

The findings of the paper underscore the potential importance of public consumption in redistribution and risk sharing in economies with a large public sector. This issue has received

comparatively little attention in previous work on interregional risk sharing within countries.³⁷ Further research is needed to assess whether the large role of public consumption is peculiar to Italy, compensating to some extent for features of its tax and welfare system, or whether it is equivalent in size in other countries with a comparable public administration. Considering that the share of public consumption in GDP in countries such as France and the United Kingdom is similar to that in Italy, that their interregional discrepancies are lower (meaning there is even less of a reason to expect differences in per capita public consumption expenditure across regions than in Italy), and that public consumption is unlikely to vary much with regional economic activity, the amount of redistribution and risk sharing achieved through it may not differ much from that in Italy, which stands at some 10–15 percent of GDP. Of course, it would account for a much lower share in total redistribution and risk sharing in these countries where the size of other instruments is considerably higher than in Italy.

Whether it makes sense from a public policy point of view to maintain a fairly uniform level of per capita public consumption across regions when there are large interregional differences in incomes, such as in Italy, or whether some inequality in the provision of per capita government services, in exchange for say, a better welfare system and more investment might not be preferable, is a matter of debate. Evidence suggests that the quality of public services provided in Italy's poorer regions is, if anything, lower. Moreover, recent work has underscored the potential adverse effects of public consumption on economic growth.³⁸ Considering that there has been no convergence in per capita incomes across regions in Italy over the last two decades, the results presented in this paper should prompt at least some questioning of the allocation of public expenditure in Italy in the context of defining regional development policies.

³⁷Cross-country evidence leads Rodrik (1998) to argue that government consumption plays an important role in mitigating risks stemming from countries' openness to trade.

³⁸See Tullio and Quarella (1998) for Italy, and Rappaport (1999) for the United States.

Table 1. Italy: Regional Public Finance, Summary Statistics

(Per capita levels in real terms and in percent of national total, unless otherwise noted)

	PI	VDA	LO	TAA	VE	FVG	LG	ER	TO	UM	MA	LZ	AB	ML	CM	PU	BS	CL	SIC	SAR
	Piemonte	Valle d'Aosta	Lombardia	Trentino Alto Adige	Veneto	Friuli Venezia Giulia	Liguria	Emilia Romagna	Toscana	Umbria	Marche	Lazio	Abruzzo	Molise	Campania	Puglia	Basilicata	Calabria	Sicilia	Sardegna
Geographic location 1/	NW	NW	NW	NE	NE	NE	NW	NE	C	C	C	C	S	S	S	S	S	S	S	S
Population	1970-95																			
average (in hundreds of thousands)	44.3	1.1	88.5	8.8	43.3	12.2	17.9	39.3	35.6	8.1	14.1	50.3	12.4	3.3	55.4	39.1	6.2	20.9	50.1	16.0
GDP	1970-95																			
average	114.6	136.3	127.7	120.4	111.9	113.1	114.6	124.7	109.3	94.1	103.6	111.8	86.8	71.2	69.1	71.3	63.0	60.1	67.6	77.4
standard error	1.8	7.3	2.3	4.7	4.1	4.3	2.3	4.4	1.5	3.8	2.4	2.3	2.3	4.5	2.7	1.2	2.4	2.5	2.0	3.1
Public consumption	1970-95																			
average	93.2	136.0	93.4	123.2	101.4	110.6	107.9	108.0	104.1	111.4	108.7	97.0	101.5	101.7	97.8	91.6	100.9	99.4	101.6	108.0
standard error	1.1	6.1	1.7	4.3	2.5	1.6	0.9	0.6	1.0	0.6	1.3	0.9	2.4	5.6	1.0	1.5	2.9	2.7	2.3	1.4
Public works initiated	1970-95																			
average	81.6	372.2	67.9	224.9	83.9	126.2	100.2	96.9	86.8	100.5	96.9	100.5	156.5	218.7	81.8	96.8	303.3	142.7	114.5	159.3
standard error	20.4	239.4	19.7	101.8	25.7	43.3	35.1	12.4	21.3	56.7	30.3	33.8	57.4	82.4	19.5	44.2	166.5	42.8	31.6	54.0
Employment in non-marketable services	1980-95																			
average	90.4	114.3	78.5	147.0	92.5	147.9	113.0	97.8	102.3	125.1	100.9	146.7	97.8	100.7	90.5	94.4	97.9	90.1	93.2	110.9
standard error	3.1	4.4	1.0	4.1	2.1	9.0	2.7	1.8	1.5	5.4	1.9	2.4	1.2	2.0	1.4	1.9	1.8	1.5	4.7	2.3
Wages in non-marketable services	1980-95																			
average	91.8	109.4	96.4	87.1	95.2	83.4	101.5	97.9	100.2	91.5	98.9	108.2	101.9	105.2	107.1	101.0	102.6	107.8	106.1	104.2
standard error	0.9	8.3	1.9	2.5	1.7	2.6	1.6	1.7	0.9	1.5	1.0	2.7	2.8	1.3	2.8	2.3	1.6	1.8	2.3	2.5
Primary fiscal balance 2/	1983-92																			
average	1.5	-3.1	3.5	-3.9	1.4	-0.6	-0.8	1.4	0.5	-1.5	-0.4	1.4	-1.9	-3.5	-2.3	-1.9	-4.3	-3.3	-2.9	-2.6
standard error	0.4	0.6	0.6	0.7	0.3	0.3	0.1	0.3	0.2	0.3	0.1	0.4	0.1	0.2	0.4	0.3	0.3	0.7	0.7	0.3
Fiscal revenue	1983-92																			
average	118.3	135.2	134.7	117.1	107.8	116.0	115.1	122.8	111.0	93.3	98.0	122.9	80.0	68.2	65.5	64.7	61.8	56.3	63.3	72.1
standard error	1.9	1.8	3.3	1.2	2.3	2.1	1.9	2.0	2.1	1.5	0.6	2.0	0.5	1.5	2.2	0.8	1.3	2.8	1.1	1.0
Indirect tax revenue	1983-92																			
average	109.9	165.6	121.5	131.4	108.0	115.1	116.5	122.1	109.8	98.6	103.7	116.3	90.6	73.2	70.7	72.9	64.5	66.1	73.7	80.9
standard error	1.0	7.1	3.0	2.7	2.5	1.6	1.3	2.1	0.3	1.0	0.8	3.0	0.7	1.1	3.2	0.9	1.3	1.7	1.5	1.4
Current primary expenditure	1983-92																			
average	104.5	143.2	98.0	116.3	94.7	120.9	127.1	109.9	108.9	111.8	104.4	104.0	99.2	99.2	88.2	89.1	79.8	90.7	94.1	97.3
standard error	1.3	4.9	1.1	1.9	0.8	1.5	3.3	1.8	0.4	1.3	1.1	3.5	1.5	1.1	1.8	1.1	0.7	0.4	3.0	1.2
Transfers to firms	1983-92																			
average	101.3	208.4	90.5	122.6	88.6	156.0	183.5	101.6	103.2	116.1	91.3	132.8	108.1	128.9	82.9	78.4	114.5	84.3	81.8	92.0
standard error	3.5	32.6	3.1	8.6	4.4	20.1	20.0	4.3	0.4	8.0	5.6	8.6	7.6	10.5	6.0	4.2	8.4	3.8	5.8	6.8
Social benefits	1983-92																			
average	114.9	134.1	104.8	98.8	91.9	123.3	135.0	115.7	114.5	112.5	103.2	104.0	96.5	89.8	80.8	84.9	84.0	82.1	87.8	88.1
standard error	2.7	9.2	1.7	1.2	2.0	1.8	0.9	3.1	0.9	2.9	1.5	3.6	1.1	1.8	3.1	1.1	1.5	1.2	1.4	2.4
Capital expenditure	1983-92																			
average	74.9	364.8	69.1	251.6	77.4	130.9	94.7	80.0	77.1	97.6	86.8	129.2	126.5	172.9	122.9	71.9	228.4	123.9	115.8	134.2
standard error	6.2	36.2	3.4	36.1	5.5	7.0	10.9	6.3	6.6	9.6	7.1	17.0	14.0	18.7	14.4	9.3	35.1	10.8	9.4	13.9
Indicators of relative fiscal effort:	1983-92																			
Revenue in percent of per capita GDP 3/	103.0	101.2	104.6	95.8	95.4	101.6	101.6	98.0	102.3	97.8	94.5	109.2	90.6	91.5	95.7	90.4	99.1	95.7	94.3	95.9
Benefits in percent of per capita income 4/	96.2	104.2	82.0	87.4	83.0	110.4	118.2	93.3	102.7	118.0	99.5	91.6	116.2	119.0	113.3	122.6	125.6	132.7	136.0	116.0

Sources: ISTAT; and author's calculations.

1/ NW stands for northwest, NE for northeast, C for center, and S for south.

2/ Per capita primary fiscal balance less national per capita balance, in millions of 1990 lire.

3/ Ratio of relative per capita revenue to relative GDP, in percent.

4/ Ratio of relative per capita social benefits to relative household income, in percent.

Table 2. Italy: Redistribution and Risk Sharing 1/

Variable	Type	Functional specification	Data source	Cumulative redistribution (In percent of regional GDP) R 2/	Cumulative risk sharing (In percent of regional GDP) R 2/ Period 1	Period 5
I. Source A						
Personal income taxes and contributions less welfare benefits		1 lag; levels; 1983-92	"	-18.1	-7.1	-3.5
		2 lags; levels; 1983-92	"	-18.9	-7.3	-6.3
II. Source B						
Public consumption	FISCAL	2 lags; natural logarithm 1980-95	Income accounts	-13.4	3/ -14.9	-16.0
Public works initiated	FISCAL	2 lags; natural logarithm 1980-95	Reports to ISTAT	-13.9	3/ -15.0	-17.7
Subsidies to firms	FISCAL	1 lag; natural logarithm 1983-92	Public administration accounts	-14.7	-17.4	-20.9
Welfare spending	FISCAL	"	"	-19.0	-27.6	-26.2
Total primary revenue 4/	FISCAL	"	"	-31.3	-10.2	-29.4
III. Source C						
Current primary expenditure	FISCAL	1 lag; natural logarithm 1983-92	Public administration accounts	-18.2	-28.0	-21.6
Capital expenditure	FISCAL	"	"	-21.2	-26.7	-21.1
Total primary revenue 4/ excluding indirect taxes and subsidies	FISCAL	"	"	-34.4	-9.6	-24.1
		"	"	-33.8	-12.0	-18.5
IV. Source D						
Primary fiscal balance less two standard deviations 5/	FISCAL	1 lag; levels; 1983-92	Public administration accounts	-31.5	-12.5	-37.7
				-19.0
Primary fiscal balance less two standard deviations 5/	FISCAL	2 lags; levels; 1983-92	"	-33.0	-5.5	-22.5
				-20.9

1/ Sections I, II, III, and IV are calculations of redistribution or risk sharing based on alternative data sources (see text).

2/ The word "cumulative" means that the various fiscal categories are incorporated one after another to compute redistribution or risk sharing.

Note that this is only relevant for Sections II and III, as these are the only sections showing how redistribution and risk sharing change as one expenditure and revenue category is incorporated in the calculation of R after another. Contributions to R of specific categories can thus be inferred from the change in R as these categories are incorporated. For Section I, R is expressed as a share of household income, not GDP.

3/ Running the regressions with data for 1970-95 yields estimates for redistribution between 13.4 to 14.4 percent.

4/ This being the final row of the section, it shows total redistribution and risk sharing according to this particular data source.

5/ Assumes the parameter estimate in the regression line through the steady state values is two standard errors lower.

Table 3. Italy: Recent Developments in the South

		Per capita, in 1990 lire, south less national in percent of national	In percent of GDP, south less national
GDP per capita	1985	-29.7	...
	1990	-31.9	...
	1992	-31.7	...
	1995	-34.2	...
	1997	-35.0	...
Public consumption	1985	-0.5	7.6
	1990	-1.2	7.9
	1992	-0.6	8.1
	1995	-0.1	8.7
	1997	1.4	9.0
Public works initiated	1985	0.6	0.7
	1990	-0.1	0.5
	1992	1.9	0.5
	1995	-16.7	0.3
	1996	-43.7	0.1
Current primary expenditure 1/	1992	-5.9	8.2
	1995	-3.4	9.6
	1997	-3.3	8.2
Capital expenditure 1/	1992	20.0	2.7
	1995	8.0	2.4
	1997	3.7	2.0
Welfare benefits 1/	1985	-9.0	3.6
	1990	-10.8	5.7
	1995	-16.8	4.9
Taxes and contributions 1/	1985	-37.8	-2.5
	1990	-39.3	-3.3
	1995	-35.5	-1.0

Source: ISTAT and author's calculations, unless otherwise noted.

1/ Source: SVIMEZ. These data are not comparable to the ISTAT data.

Figure 1. Italy:
Regional Divided by National Per Capita Real GDP

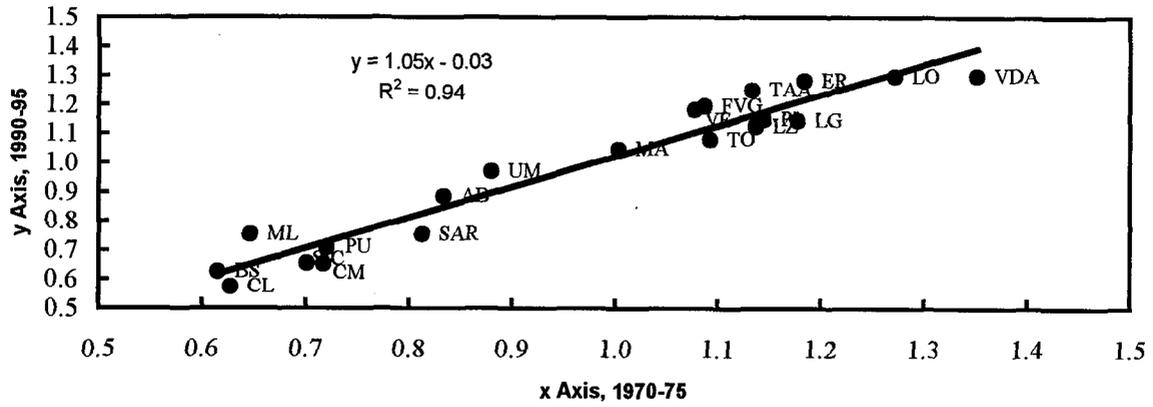


Figure 2. Italy:
Steady State Per Capita Real Household Taxes and Contributions less Welfare, 1983-92

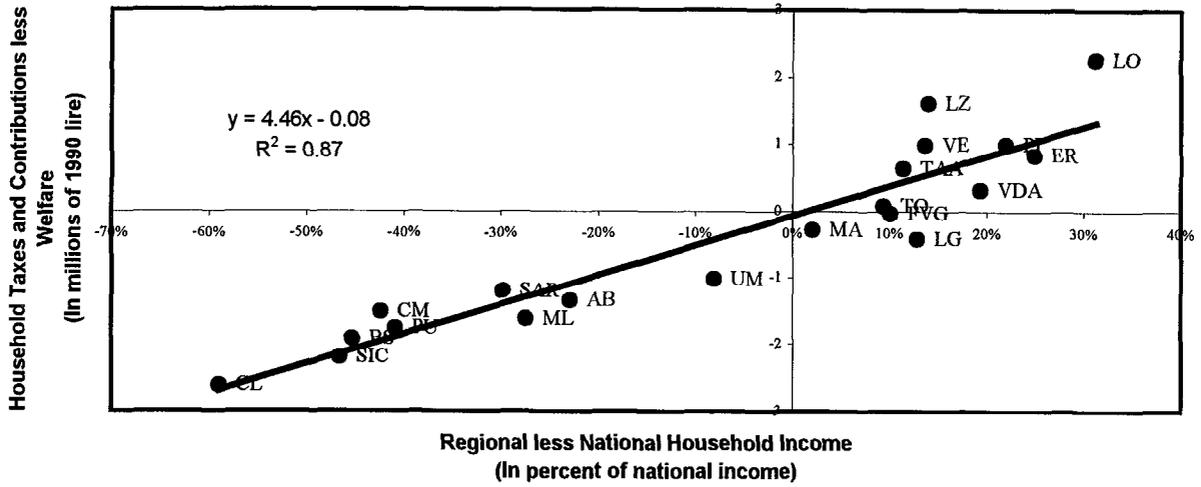


Figure 3. Italy:
Steady State Per Capita Real Public Consumption and Per Capita Real GDP, 1980-95

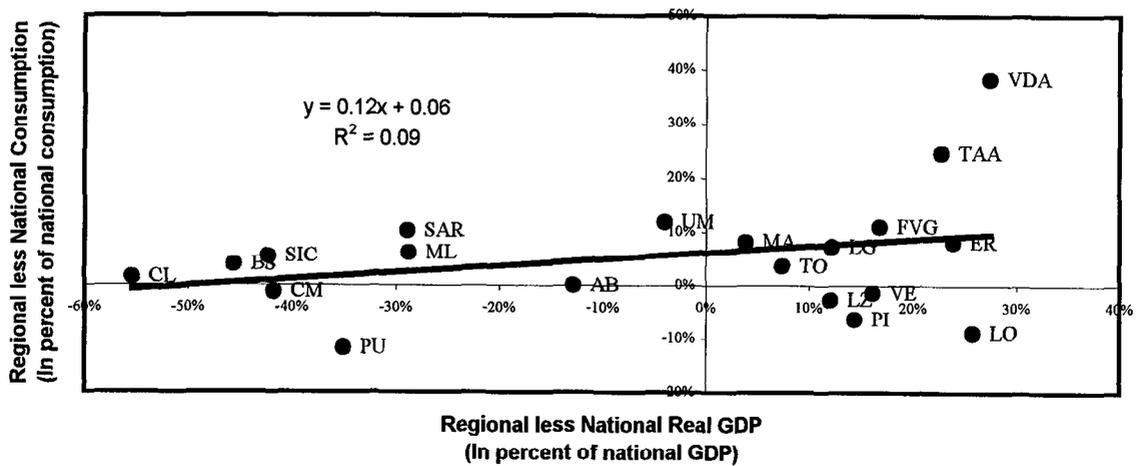


Figure 4. Italy:
Steady State Per Capita Real Public Works and Per Capita Real GDP, 1980-95

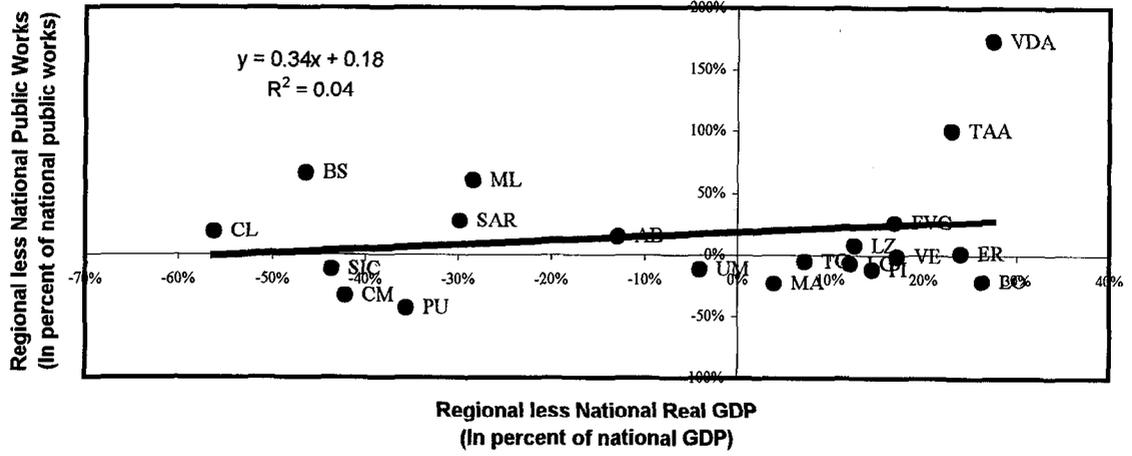


Figure 5. Italy:
Steady State Per Capita Real Welfare and Real GDP, 1983-92

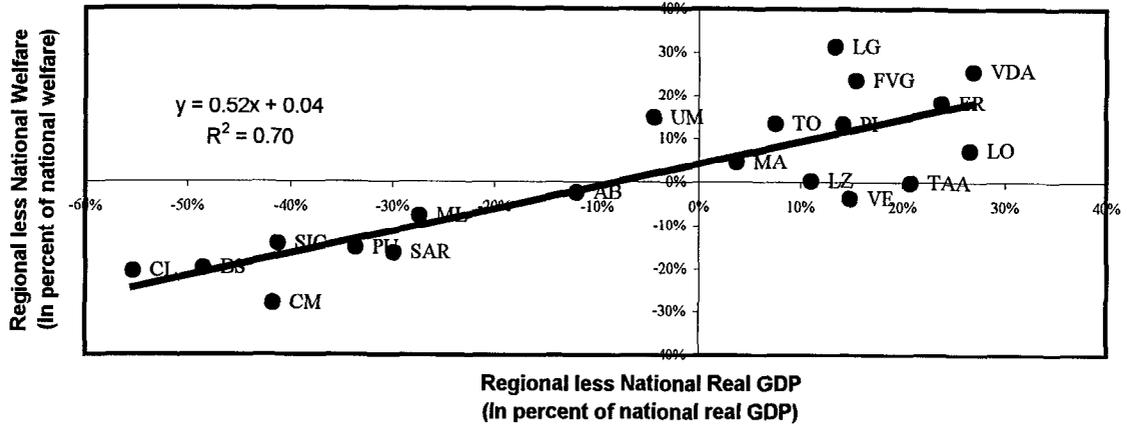


Figure 6. Italy:
Steady State Per Capita Real Subsidies and Real GDP, 1983-92

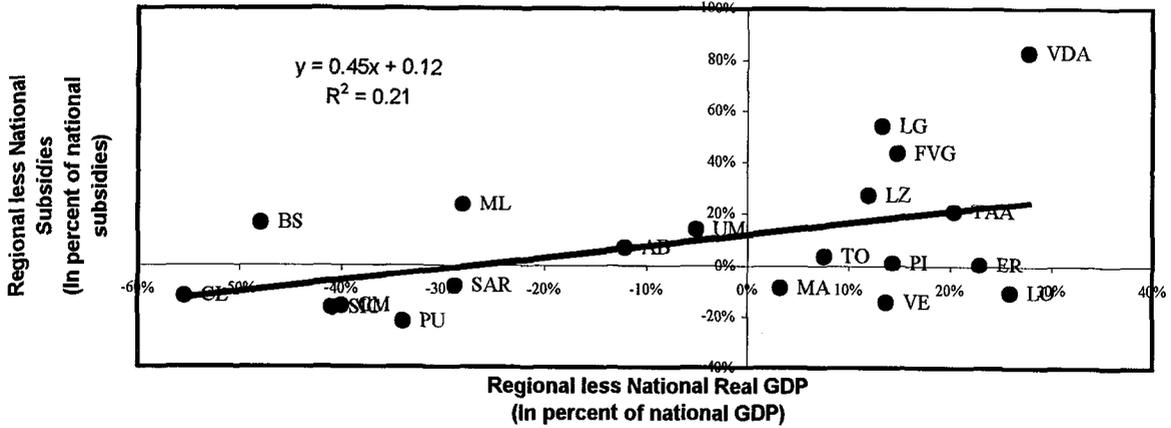


Figure 7. Italy:
Steady State Per Capita Real Fiscal Revenue and Real GDP, 1983-92

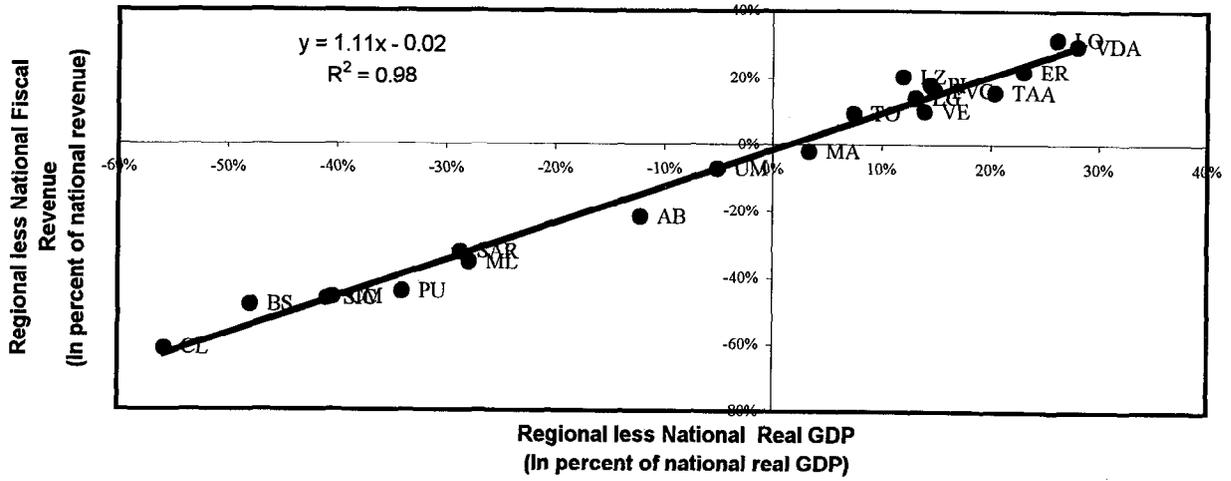
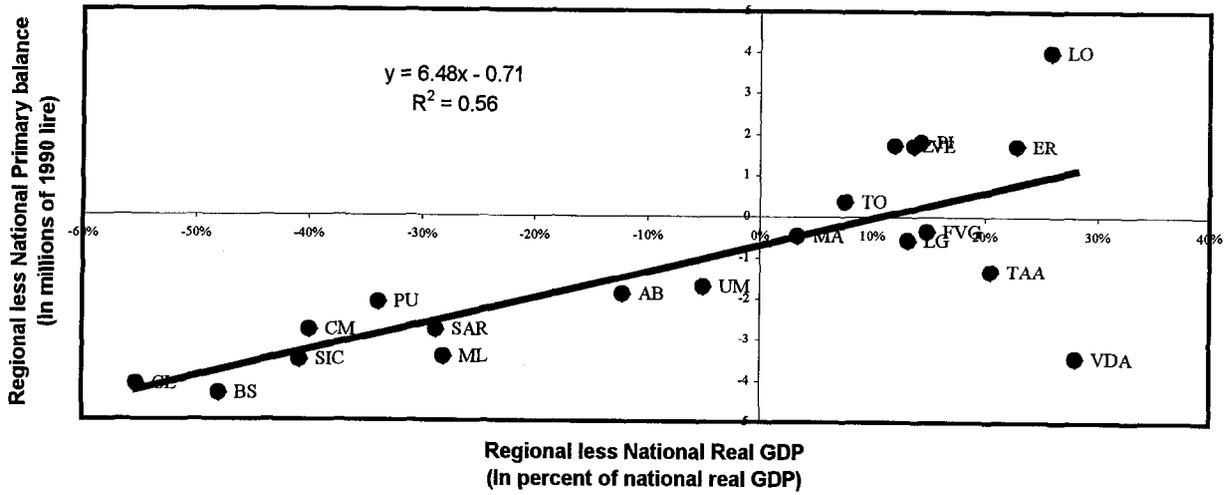
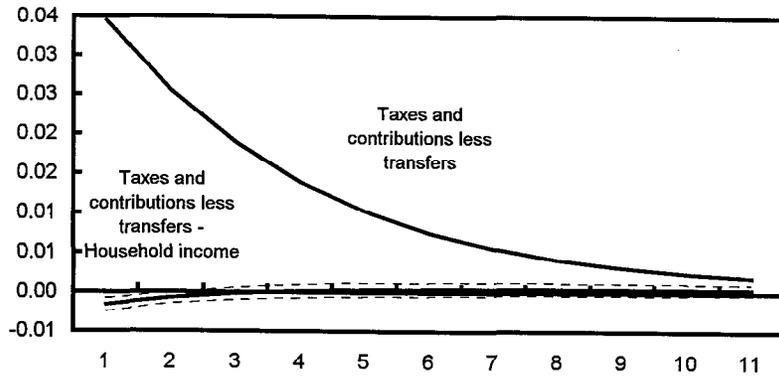


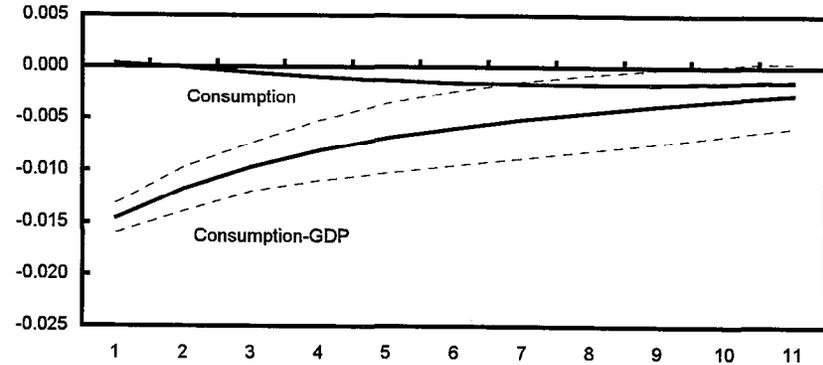
Figure 8. Italy:
Steady State Per Capita Primary Balance and Per Capita Real GDP, 1983-92



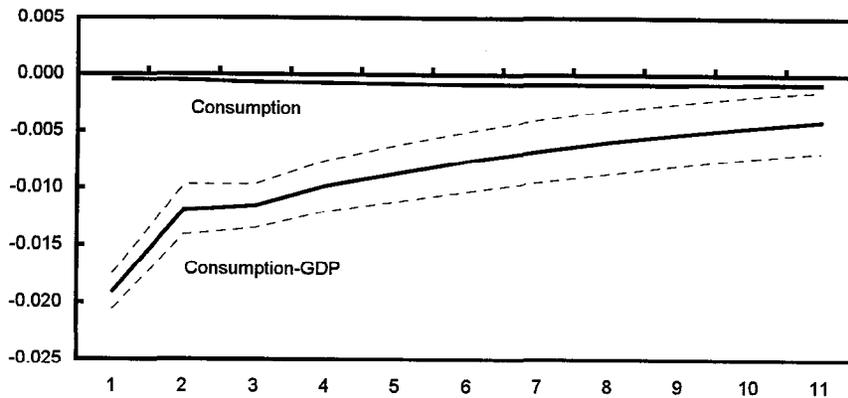
**Figure 9. Italy:
Impulse Response of Taxes and
Contributions less Transfers, 1983-92**



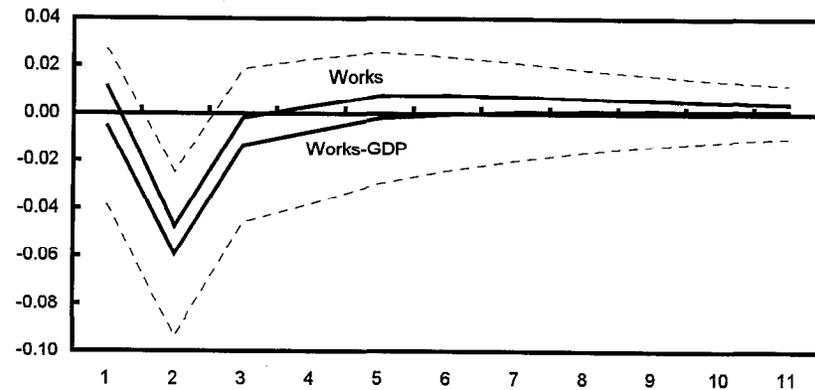
**Figure 10a. Italy:
Impulse Response of Public Consumption,
1980-95**



**Figure 10b. Italy:
Impulse Response of Public Consumption,
1970-95**

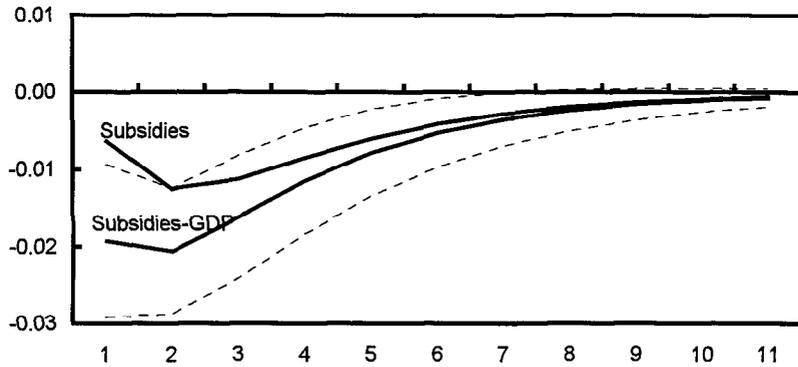


**Figure 11. Italy:
Impulse Response of Public Works,
1980-95**

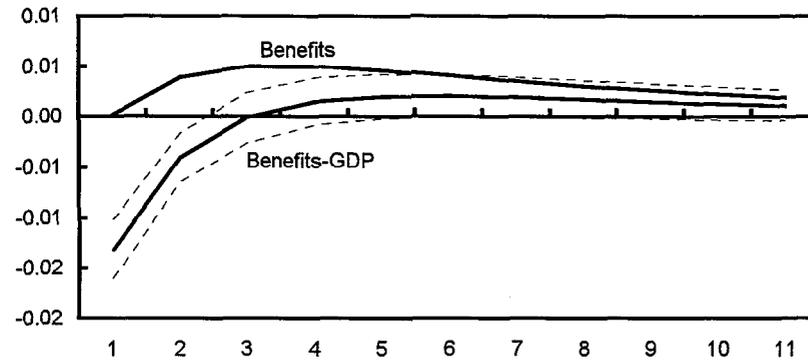


Note: The dotted lines comprise a confidence interval which is 2 standard errors wide on each side of the response of the variable of interest less household income or GDP. Confidence intervals around the response of the variables of interest are not shown.

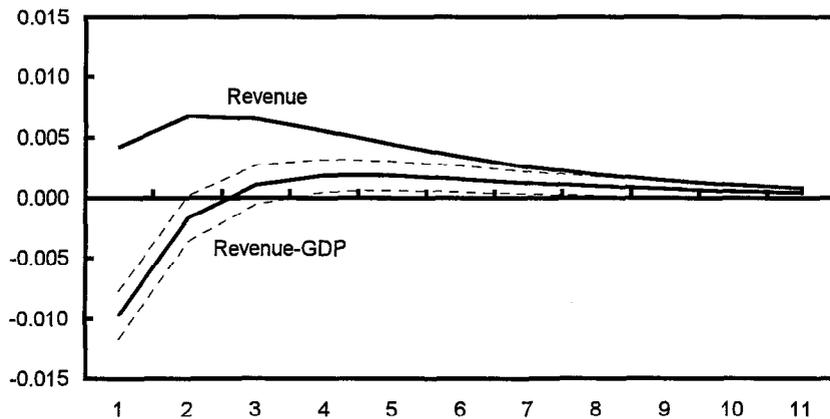
**Figure 12. Italy:
Impulse Response of Subsidies, 1983-92**



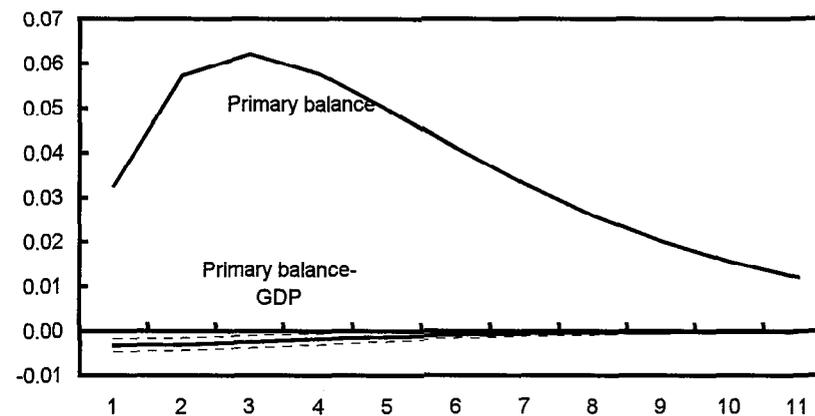
**Figure 13. Italy:
Impulse Response of Welfare, 1983-92**



**Figure 14. Italy:
Impulse Response of Fiscal Revenue, 1983-92**



**Figure 15. Italy:
Impulse Response of Primary Balance, 1983-92**



Note: The dotted lines comprise a confidence interval which is 2 standard errors wide on each side of the response of the variable of interest less GDP. Confidence intervals around the response of the variable of interest are not shown.

DATA SOURCES

The data were provided by the *Istituto Nazionale di Statistica* (ISTAT) and include:

- (a) Regional economic accounts, 1970–84.
- (b) Regional economic accounts, 1980–95.
- (c) Regional economic accounts for public administrations and households, 1983–92.
- (d) Various issues of the *Annuario Statistico Italiano* published by ISTAT.

Unless otherwise noted, the data on the real economy, including on regional real GDP, GDP deflators, components of value added at factor cost, and public consumption are from (a) and (b) above. Note that the old regional economic accounts data (1970–84) differ considerably from the new data (1980–95) for overlapping years: for example, for regional real GDP and public consumption the growth rates in 1981–84 differ by up to 5 percentage points in any direction for particular years and regions. To splice the series, the data for a particular variable of the regional economic accounts for 1970–79 were multiplied by the average over 1980–84 of the ratio of the value for that variable in the new data over the value for that variable in the old data. For all the variables for which data are available from 1970 onward, regressions are run separately for the period 1980–95. The results are generally unaffected by the splicing.

Data on employment and compensation in nonmarketable services are available for 1980–95 only and come from Source (b). Wages paid in nonmarketable services are obtained as a ratio of total compensation (including employers' social and other contributions) and employment in nonmarketable services. The sector of nonmarketable services does not coincide with the public administration but the overlap is very large. In fact, some nonmarketable services are offered by the private sector. These include domestic services as well as services provided by private social institutions: at the national level, their share in value added of nonmarketable services amounted to about 8 percent in 1995—data for these series are not available at the regional level. In addition, the public administrations provide marketable services: in 1995, these amounted to about 8 percent of their nonmarketable services. Note that neither the nonmarketable services sector nor the public administration comprise the activities of some, major state-owned enterprises such as the postal system and the railways. To the extent redistribution of resources takes place through these entities, it is not captured in this study.

Regarding the data on new public works initiated from Source (d), there is a break in 1984. Also, the coverage of the data is not necessarily complete, as some public agencies did not transmit data in line with the requests by ISTAT. To the extent the incompleteness of coverage is similar across regions and the break has had a similar effect across regions, the results should not be affected. There is, however, no evidence against which this could be checked.

Data relating to fiscal variables other than public consumption and new public works initiated comes from Source (c). A detailed description of how they were generated can be found in

ISTAT (1996). In the data, each region is treated as if it was a separate economy with a separate public administration, the constraint being that the data for the various variables of the regions have to add up to the national, general government data for those variables. The operations carried out by the central administration in Italy are thus allocated across the regions. Several issues should be underscored which, at the risk of simplifying, can be summed up as follows. Indirect taxes are allocated in line with data on regional consumption or production. Direct taxes on households and autonomous workers are allocated based on information contained in tax declarations. Direct taxes on firms operating in several regions are obtained from tax declarations as well as micro data on such enterprises' accounts. The problem is that taxes of multiregional enterprises are paid at their legal residence but need to be allocated across regions in line with the value added produced by these enterprises in the various regions. A similar issue arises with social contributions paid by employers. For both the allocation is done largely in line with data on such enterprises' personnel costs in their various plants, while considering the type of activity in the plants. Primary expenditure is allocated across regions in line with data on personnel, labor costs, and number of pensioners. Health expenditure is easier to allocate, as it is administered largely by local authorities; and capital expenditure is allocated based on information from various surveys and accounts. Note that the central government is the final spender for about one-third of total primary expenditure of public administration since 1981 (Emiliani and others, 1997).

For interest expenditure, 95 percent of which falls on the central government, the allocation across regions is quite difficult both in practice and from a conceptual point of view. It has been done largely on the assumption that regional governments which make a lower-than-average revenue raising effort and spend a higher-than-average share of their GDP are responsible for more per capita debt. Interest expenditure has not been considered in the empirical analysis in this paper.

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