

# **Net fiscal flows and interregional redistribution in Italy: A long run perspective (1951-2010)**

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**Abstract:** By providing a long run reconstruction of regional Net Fiscal Flows (NFFs) in Italy throughout the last six decades (1951-2010), this paper documents the substantial rise of fiscal transfers to Mezzogiorno (i.e. Southern Italy) from the rest of the country. Besides, three further arguments are presented. First, we find that the prominent upsurge of NFFs in 1980s and 1990s has exerted a scarce impact on the North-South gap, mainly because it has not been connected to a stronger commitment in supply-side regional and development policies, and the needed rise of capital expenditure in Mezzogiorno. Second, we ascribe most of the increase in NFFs to the generalized escalation in current primary expenditure related to the “decentralization without accountability” design of fiscal reforms implemented in the 1970s. Third, we evaluate the size of interregional redistribution relative to regional income differences and the burden imposed to contributing regions. By making use of several indexes and analytical procedures intensively used in the literature, we reach the conclusion that interregional redistribution in Italy has been moderate, considering the severity of initial differences in economic and social conditions.

**JEL classification:** H50, H70, H72, R10.

**Keywords:** Italian Mezzogiorno, net fiscal flows, regional redistribution, regional disparities

## 1. Introduction

The dualistic structure of the Italian economy is unique among the countries of the European Union, for both the width of the gap between rich and poor regions and the geographic size of the relatively underdeveloped area – the so-called Mezzogiorno –, which accounts for more than 40% of national territory. Despite more than 60 years of regional policies, GDP per capita in the regions of Mezzogiorno (i.e. Abruzzo, Molise, Campania, Apulia, Basilicata and Calabria plus the islands Sicily and Sardinia) is nowadays still around 60% of that of Centre-North, GDP per worker around 80% and the unemployment rate nearly twice as much as the national average.

The presence of large and long-lasting differences between North and South of Italy in many indicators of economic and social development has urged public intervention and a strong financial commitment by central and local governments for the implementation of policies sound to promote regional convergence and territorial rebalancing, at least since the 1950s. Characterized by different strategies, intermediate objectives and financial constraints, any public policy designed to fill the economic gap and apply the constitutional precepts (citizens' equality in accessing essential public services and progressivity criteria in income taxation) has to some extent involved an inevitable redistribution in favor of Mezzogiorno from the more affluent Northern regions. This has originated an ongoing debate on the size of the Southern Net Fiscal Flow (NFF), i.e. the difference between total public expenditures targeted to Mezzogiorno regions and public revenues raised from that area<sup>1</sup>, as well as on the burden imposed on contributing regions, its economic sustainability and even possible consequences on country stability, territorial conflict and incentives to secessions.

The relevance of this issue is clearly not restricted to the Italian case, which is both a particularly controversial one and peculiar since Italy is not even a federal country. A flourishing literature on the interregional redistribution operated through fiscal flows (see for example Bayoumi and Masson 1995, Barberán *et al.* 2000, Bosch *et al.* 2002, Rodden *et al.* 2003, Bosch *et al.* 2010) has pointed out how the issue is multifaceted and contentious in many countries, especially for the difficulty to single out how much of vertical (from central to local governments) and horizontal (from rich to poor local governments) transfers are worth (i.e. can be actually ascribed to the genuine purpose of offsetting geographical disparities) or instead unjustified and due to other motivations such as: a) political

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<sup>1</sup> Postponing details on the definition of NFF to section 3, it is however the case to recall here that in the literature NFF takes on a variety of other names, such as fiscal residuum, fiscal balance, net fiscal transfer and so on.

interests, lobbying, corruption which often drive decisions on public resources' redistribution, and b) inefficiencies in the provision of local public services which inflate costs and call for bailouts.

The subject of this paper is closely connected to this debate. Our objective is threefold: we intend first to carry out a historical reconstruction of regional NFFs throughout the last six decades, aiming at estimating the size of interregional redistribution and its evolution over time. To the best of our knowledge, it is an unprecedented attempt, since existing literature has solely dealt with short time spans so far. Secondly, we focus on the potential benefits of redistribution, especially the possible resulting reduction of the North-South socio-economic gap. This is done by exploring facts and data which connect the dynamics of regional NFFs with the evolution of the North-South divide. Thirdly, we focus on the costs of redistribution meant as the weight imposed on the rest of the country, in terms of the amount of transferred financial flows, taking into account the differences in interregional GDPs which justify public intervention. By doing so, we seek to give an assessment on the intensity and adequacy of the redistributive effort in favour of Mezzogiorno.

On the other hand, disentangling the shares of due and undue redistribution in Italian regional NFFs goes beyond our purposes: while we firmly believe that the opportunistic and inefficiency motives behind governments' redistribution policies are distortions to fight (Padovano 2007; 2012), we also deem that in general they are not a good enough reason to give up public intervention for social inclusion and economic convergence of lagging regions.

After this introduction, section 2 summarizes the main issues of the discussion on the Southern financial dependence on fiscal transfers, its origins and motivations and the recent developments. Section 3 covers the long run reconstruction of regional NFFs, by building up (discontinuous) time series of public revenues and expenditures for regions and macro-regions (North-West, North-East, Centre and Mezzogiorno). Section 4 is devoted to jointly analyze the dynamics of regional NFFs and the evolution of the North-South gap. As we will see in detail, facts and data seem to show that no significant correlation emerges between interregional redistribution and regional convergence. In fact, the sustained process of regional convergence of the 1950s-1960s has been achieved at the cost of modest interregional transfers while, on the other hand, the North-South gap has widened just in correspondence to larger NFFs in the 1980s. Then, from the mid-1990s onward, a stable or slightly decreasing gap has been matched by lower NFFs. Section 5 gives an assessment on intensity and adequacy of the redistributive effort in favor of Mezzogiorno. Our evaluation, based on the calculation of indicators and the implementation of techniques widely used in the international literature, is that Mezzogiorno has benefited from large and increasing levels of transfers of public resources, but

nevertheless the intensity of redistribution can hardly be judged excessive, considering the inequality of regional GDPs and the constitutional principles of citizens' equality in accessing public services. Section 6 concludes the paper with a summary of our main conclusions.

## **2. The North-South dualism and interregional redistribution: a long standing discussion**

Early empirical studies on the regional redistributive effects of public finance in Italy date back to Pantaleoni (1891) and Nitti (1900). These two studies share the following conclusion: in the post-unitary period, the South suffered from a consistent drain of public resources following the extension of the fiscal system of the Kingdom of Sardinia to the other pre-unitary States. As a matter of fact, the 1861 Italian unification brought about two main facts causing Mezzogiorno to contribute to the financing of national public budget to a higher extent than the North, despite its lower per capita income and population. First, the fiscal system of the Kingdom of Sardinia was characterized by a higher number of taxes and tributes as well as higher average tax rates. Hence, its extension to the Kingdom of the Two Sicilies led to increased fiscal pressure in the provinces of Mezzogiorno. Second, the governments of the time targeted the North with high levels of public investment for infrastructures aimed to support the ongoing industrial take off of local economies, while for the South an agricultural-based model of development was preferred.

Pantaleoni (1891) provides the first attempt to evaluate regional fiscal pressure relative to the regional distribution of national wealth for the years 1884-1889. The fiscal burden attributed to each region includes taxes levied on income, business activities, consumption and lotteries. In the absence of figures on regional income and wealth, the author first estimates the regional shares of national wealth by using the regional distribution of estate tax revenues; then, by comparing the regional distributions of fiscal burden and wealth, he shows how the uneven (i.e. not proportional to wealth) regional distribution of fiscal burden across regions favors residents in the North of the country. In fact, Northern regions (Piedmont, Liguria, Lombardy, Veneto) hold 48% of national wealth, bearing only 40% of national fiscal burden; for Central regions (Emilia, Tuscany, Marche and Lazio) the corresponding figures are 25% of wealth and 28.5% of taxes; for Mezzogiorno 27% of wealth and 32.5% of taxes.

Nitti (1900) delivers for the first time regional estimates of the distribution of both tax burden and public expenditure for the years 1893-94 and 1897-98. On the tax revenues side, his conclusions agree with Pantaleoni: fiscal pressure comes out to be relatively higher in the South than in the North, the gap being larger for income taxes. Likewise, he finds evidence of a clearly uneven regional distribution of

public spending in favor of the North, especially for military expenditures<sup>2</sup> (at that time the main category of primary public expenditure), public investment in infrastructures<sup>3</sup>, public security and public workers' salaries. Summarizing, in the view of Nitti, during most of the first 40 years after unification, the combination of higher fiscal pressure and lower public spending in the South produced a net flow of public resources toward the North. Northern tax payers were indeed contributing to the financing of public services by less than their potential fiscal capacity, while benefiting from relatively higher per capita levels of public services than the South<sup>4</sup>.

The results of Pantaleoni (1891) and Nitti (1900) are criticized by Gini (1962) who argues that the methodological flaws of those studies in the estimation of the regional distribution of wealth and fiscal burden are so severe to imply strongly biased results<sup>5</sup>. Nevertheless, his own estimations, obtained after a number of methodological corrections, yield a regional distribution of the fiscal burden very similar to the one by Nitti. On the other hand, he concludes that the lack of more detailed data makes it just impossible to consistently compare the tax contribution of an average tax payer with the benefit received in terms of public services.

After Nitti (1900), none other empirical investigation has attempted to get reliable estimates of the regional distribution of public spending until the 1960s. Conversely, much effort has been devoted to the estimation of fiscal pressure at the regional level, and the debate mostly focused on size and direction of the implied fiscal redistribution between the two macro-regions of the country. In this vein, Bernardino (1928) and Zingali (1933) reach opposite conclusions by looking at the years just before (1911-13) and after (1919-21) the First World War. A major feature of Bernardino (1928) is the regional repartition of excise and customs duties, made under the assumption that their incidence in a given region be proportional to the amount of all other taxes collected in the same region. Following this assumption, the contribution of Northern regions to tax revenues is estimated at about 58.9%, while

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<sup>2</sup> As an example, military expenditure in the North was about twice as much as in the South, even if only half of the army was located in the Northern regions.

<sup>3</sup> In particular, Nitti (1900) finds that payments of the Ministry for Public Works (including public investment in railways) were higher in the North. However, Picci (2002) presents different results on the same issue.

<sup>4</sup> Many years later, Giarda (1982) reaches similar conclusions: the South contributed to national tax revenues by more than its own fiscal capacity in the years 1860-1897; with particular reference to 1897-1898, per capita fiscal burden was 7.5% higher in the North than in the South, although the difference in per capita income among the two areas was not lower than 30%.

<sup>5</sup> The main limitation of the work carried out by Pantaleoni and Nitti rests in the use of data on taxes collected in a given region as the indicator for fiscal pressure in that region, which overlooks the problem of the geographical distribution of the real incidence of taxes. This shortcoming is due to the unavailability of data suitable for the apportionment of taxes according to the incidence criterion. Furthermore, Nitti estimates the regional distribution of different categories of public expenditure by using only data on the Ministries' payments settled by Provincial Treasuries thus ignoring the problem of allotting at the regional level the payments settled by the Central Treasury.

their share of wealth amounts to 53.5%. On the other hand, the South contributes to tax revenues by less than its share of wealth (8.3% versus 11.2% in the islands and 18.7% versus 21.0% in the remaining Southern regions). The higher contribution of the North as compared to its fiscal capacity is estimated to be even greater in the period 1919-21. Zingali (1933) criticizes the methodology of the regional allotment of taxes employed by Bernardino. As a result of his adjustments, Zingali finds the North to be beneficiary of a net transfer of resources.

Soon after the Second World War, the debate is revitalized by the availability of new data allowing for more appropriate regional sharing of fiscal burdens. In particular, regional data on consumption become available and this makes it possible to provide estimates of the distribution of indirect taxes based on their actual geographical incidence. Employing this additional information, but considering two different spans of time, i.e. respectively 1952-53 and 1953-54, and using different methods to evaluate the regional incidence of taxes, De Meo (1955) and Stammati (1955) find starkly different results. According to De Meo, Northern regions contribute 59.1% of total tax revenues while accounting for 61.3% of national income; Central and Southern regions respectively pay 20.7% and 18.6% of total taxes and produce 19.0% and 17.8% of national income. Instead, Stammati (1955) maintains that the North contributes to national tax revenues by more than its own fiscal capacity.

The first attempt to supply regional estimates of both tax revenues and public expenditure after Nitti (1900) is made by Tarquinio (1969). This study, using cash-flow data on revenues (collected taxed) and payments (public spending), registered by Provincial Treasuries and reported in the “Conto Riassuntivo” (Summary Statistics) of the Ministry of Treasury from 1951 to 1965, suffers from two main limitations. First, as noticed by Forte *et al.* (1978), tax collected and/or payments settled by a given Provincial Treasury are not necessarily linked to economic facts taking place in the same Province; as Tarquinio himself recognizes, public works carried out in Naples could in principle be paid by the Provincial Treasury of Milan, or *viceversa*. Second, Tarquinio does not consider and distributes over regions the payments settled by the “Tesoreria Centrale” (Central Treasury); moreover, he takes into account only of a share of the payments settled by the Provincial Treasury of Rome. These omissions, according to Geri and Volpe (1985), imply that only 45% of total public expenditure is actually attributed to regions, while the remaining 55% is left out of the picture. On the other hand, Tarquinio (1969) presents three important merits. First of all, this study fills a research gap after many years. Second, unlike previous investigations, it uses *actual* public finance data, rather than data *estimated* from the distribution of personal income, personal wealth or other macroeconomic variables available at the regional level. Finally, it considers a remarkably long span of time. Its main results

indicate that Northern regions have benefited from a relatively higher level of public expenditure, while the regional disaggregation of the tax burden shows a slight relative advantage for Southern regions in terms of both fiscal pressure and per capita fiscal burden. This evidence leads the author to conclude that between 1951 and 1965 ordinary public resources have mainly been allotted to territories in accordance with their economic weight in terms of share of GDP and political importance, despite the rebalancing goals of the ongoing “Intervento Straordinario” (Special Aid Program) for the development of Mezzogiorno.

The onset of “Regioni a statuto ordinario” (regional governments) in the early 1970s represents a structural break to the national tradition of strong centralization of the public sector. Fiscal decentralization and the presence of different levels of government bring about additional difficulties for a correct imputation of revenues and expenditures to the different regions. Forte *et al.* (1978) and Geri and Volpe (1985) try to cope with such difficulties in two alternative ways. Forte *et al.* (1978) find a strong North to South redistribution, while Geri and Volpe (1985) identify in the regional distribution of public spending the source of a relative advantage for the North.

Forte *et al.* (1978) estimate regional fiscal imbalances for the years 1971-1973 by using a number of indicators to proxy the regional distribution of taxes and public expenditure items<sup>6</sup>. The evidence they collect allows them to document the existence of a significant drain of resources from the North to Mezzogiorno in the considered period. This North-South redistribution occurs through both a lower tax pressure and (especially) a higher expenditure in the South. More importantly, according to Forte *et al.* (1978), redistribution seems to be more effective in reducing current disposable income differences than filling the infrastructural and production gap between the two areas.

Geri and Volpe (1985) regionalize public expenditure flows in the 1970s by following the alternative strategy of using actual data retrieved from the “Conti consolidati del settore pubblico” (Public Administration General Accounts) in order to provide a quantitative assessment of the regional relative (dis)advantage produced by the allocation of public resources for the years 1971, 1975, 1977 and 1981. To do that, they compare the regional shares of public spending with the regional distribution of population and GDP, so identifying two stable patterns for Northern and Southern regions. On the one hand, Northern regions receive a share of public expenditure that is proportional to inhabitants but below their contribution to the formation of national income. On the other hand, the share of public expenditure received by the South is lower than the share of population but higher than their

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<sup>6</sup> An assessment of these indicators is given by Parmentola (1983).

contribution to national GDP (Geri and Volpe, 1985, p. 250). More importantly, the fairness of the regional distribution of public expenditure is evaluated by analyzing disaggregated data on current and capital expenditure. The richer Northern regions benefit from higher per capita levels of current public spending with respect to Southern regions, this pattern being stable for the whole 1970s. On the other hand, consistent with the territorial cohesion objective, per capita public investment turns out to be higher in the South, although this relative advantage progressively declines over the considered period.

Since the mid-1990s the political discussion on regional fiscal imbalances has been characterized by the alleged excess of public resources transferred from the North to the South, and many advocates of the federalist reform<sup>7</sup> have conceived fiscal decentralization as a tool to empower Central-Northern regions to retain their own resources otherwise wasted in Mezzogiorno. The need to offer documented research about this issue, on which the debate has been often distorted by partisan attitudes, has spurred the recent resurgence of interest on the topic of interregional redistribution, also favored by the great improvement in the quality and quantity of data. Since 1996, the Italian Economic Development Ministry has started to systematically collect data on public revenues and expenditures at a regional level, providing the publicly available dataset of “Sistema Conti Pubblici Territoriali” (Regional Public Accounts System)<sup>8</sup>. These data represent a valuable source of information and have been indeed extensively used in a number of studies for the purpose of estimating regional NFFs or other facets of the North-South redistribution.

The main recent contributions include Pisauro (2009), Staderini and Vadalà (2009), Ambrosanio *et al.* (2010), Arachi *et al.* (2010), Grasso and Garganese (2010), Ferrario and Zanardi (2011), Giannola *et al.* (2011), Arachi *et al.* (2013), Cerea (2013), and Piperno (2013). Although these studies are heterogeneous for objectives, approaches, time spans (within the period 1996-2010) and even for data and computation methods<sup>9</sup>, they share some basic conclusions. The most important common results are the following: a) a substantial amount of resources is transferred every year from Centre-North to Mezzogiorno; b) the Southern gap in per-capita income and the endowment of socio-economic infrastructures at least partly justify differences in per capita revenues and outlays originating NFFs; c)

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<sup>7</sup> After the introduction of regional governments between 1972 and 1977, since the 1992 a reform process aiming at adopting a more decentralized fiscal framework gets under way. In 2001 the Constitution is changed to recognize a wider scope to local governments' action. More recently, fiscal autonomy has been enhanced by law 42/2009.

<sup>8</sup> See the websites <http://www.dps.tesoro.it/cpt/cpt.asp> and <http://www.rgs.mef.gov.it/> for more detailed information. These data can be usefully complemented by additional information supplied by the “Ragioneria Generale dello Stato” (State General Accountancy).

<sup>9</sup> For example, Staderini and Vadalà (2009) and Ambrosanio *et al.* (2010) extend their databases with information from other central administrations and ISTAT. Also, the kind of revenues and expenditures as well as the criteria used to regionalize central public spending are somewhat different.



halting interregional redistribution might involve heavy negative effects on Mezzogiorno and uncertain advantages for the North (for example, according to Pisauro, 2009, “There are no alternatives. The tenet for which more federalism and less redistribution are a good solution even for the South is not convincing. (...) There is instead evidence to expect increasing inequality”).

More specifically, in the view of Giannola *et al.* (2011), considering the extent of Mezzogiorno gap, the evidence of a relevant interregional redistribution from the North to the South is not a sufficient support to the view that transfers in favor of Mezzogiorno operated through the public sector are “too high” and that they impose an excessive burden to residents of contributing Northern regions. In fact, in the light of the dualistic structure of the Italian economy, redistribution is to some extent an inevitable effect of a progressive taxation system and constitutional principles which oblige government to pursue citizens’ equality in accessing public services and to act for the development of less advanced territories. Hence, in order to conclude that actual NFFs are “too high” one should contrast them with “benchmark” values consistent with the constraints set up by the constitutional precepts of tax progressivity and citizens’ equality. By making this comparison, Giannola *et al.* (2011) conclude that for most centre-northern regions actual NFFs are lower than their “benchmark” counterparts, i.e. Mezzogiorno – at least for years 2004-2006 – has not benefitted from an excessive redistribution.

### **3. A reconstruction of regional Net Fiscal Flows in Italy, 1951-2010**

#### *3.1. Methodology*

This section is devoted to a reconstruction of regional public revenues, expenditures and NFFs in Italy throughout the period 1951-2010. Going back in time to six decades, a major difficulty of this task is connected to the lack of primary (i.e. coming from direct sources) data, at least for years prior to 1996, which forces to resort to secondary data available from indirect sources, i.e. the previous studies that, with reference to different spans of time, have investigated the issue of regional fiscal flows and provided estimates of regional tax revenues and public expenditures. In particular, in what follows we refer to Tarquinio (1969) for the years 1951-1965, Forte *et al.* (1978) for the years 1971-73, ISTAT (1996) for the years 1983-1992, and Fondazione Agnelli (1998) for the year 1995.

This choice involves the problem of dealing with the heterogeneity of sources. To this purpose, we conduct a careful screening of both the items included and excluded in the calculation of aggregate variables and the methods employed for computation/estimation in each study. Then, we make the needed adjustments to make comparisons sensible: details on these adjustments are given in the

following pages and shortly recalled in the Notes to Tables A1-A6 (Appendix). More generally, a point could be raised on the quality of information on Italian territorial accounts, which especially before 1996 is often deemed not be very reliable, also due to the national tradition of extreme centralization of the public sector. Aware of this limitation, we still believe our exercise to be worthwhile and significant, considering that on one hand the previous literature has acknowledged the overall trustworthiness of our sources (even the oldest ones), and on the other hand the results we work out from our analysis are sufficiently neat to support at least qualitative (if not quantitative) conclusions on the dynamics of the examined variables. A further implication of the lack of primary data is that the time series we obtain are discontinuous, since many observations are only yearly averages over longer periods, while for some years data are missing. The nature of data, together with the small sample size makes our data not suitable for time series analysis.

To integrate the series with the data of the last two decades, we analogously select the studies by Arachi *et al.* (2010) for the years 1996-2002, Staderini and Vadalà (2009) for the years 2004-2006 and Arachi *et al.* (2013) for the years 2007-2010, which considering the employed methodology, supply the most homogeneous data with those of the previous years.

Another important methodological point to be discussed concerns the exact definition of our main variable, i.e. the Net Fiscal Flow: what is NFF and how it can be measured? It is worthwhile recalling that there are several more or less similar ways to compute NFF<sup>10</sup>. The definition we (and most of our source papers) adopt considers NFF as the difference between what the residents of a region (or a macro-region, i.e. a group of regions) contribute to the general (central, local and social security) government and what they gain from it in terms of public spending targeted to that (macro-)region<sup>11</sup>. This approach is quite comprehensive and in principle meant to include all public revenues and expenditures (with the exceptions mentioned below) relevant to a given territory. In particular, both current and capital expenditure are taken into account, while conversely revenues/expenditures of public enterprises and transfers from/to all other levels of government are excluded.

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<sup>10</sup> The methodological problems connected to measuring NFFs are addressed for instance by the papers in Part I of Bosch *et al.* (2010); for a survey, see in particular Ruggeri (2010).

<sup>11</sup> The opposite definition (i.e. public expenditure minus taxation) is also common. More generally, in federal contexts, NFF is alternatively calculated as the payments made by residents and regional government to other (federal or regional) governments minus what a region receives through direct spending and intergovernmental transfers (Ruggeri, 2010). A partly different approach distinguishes between vertical and horizontal fiscal imbalances (e.g. Bird and Tarasov, 2004); Arachi *et al.* (2010) evaluate NFFs for Italian regions and then break them down in their vertical and horizontal components.

A common feature of previous studies on regional NFFs is the omission from computations of interests on public debt. This is usually motivated by the practical problems involved in the allocation of interests among regions. Several authors also argue that interest payments should be kept out of NFFs calculation because they do not bestow additional benefits on the recipients, who would have otherwise purchased private securities. As pointed out by Ruggeri and Yu (2000), this argument is little convincing since the cost of servicing public debt is borne by taxpayers often dwelling outside the region where interests are paid and/or public debt accumulated because primary outlays were not financed by current taxes. Although the payment of interests constitutes an additional component of interregional redistribution (see Giannola and Scalera, 1995 for more detail on the Italian case), we will not include it in NFFs, given the difficulty of evaluating this item. However, some descriptive data on the regional distribution of interest payments on public debt are reported below to highlight its potential relevance in the North-South redistribution.

An additional issue we deal with concerns the possible adjustment of regional NFFs to account for aggregate public surplus or deficit. In fact, when the purpose of reckoning NFFs is that of representing the intensity of regional redistribution operated through the public sector, it seems sensible to cleanse regional balances from the amount accounting for the regional share of the overall surplus or deficit (McCracken, 1993; Mansell and Schlenker, 1995; Ambrosanio *et al.*, 2010; Arachi *et al.*, 2013). To do that, we amend original data by allocating surplus or deficit to regions on a per capita basis, so as to have a zero aggregate net fiscal flow (i.e. national aggregate NFF=0 and therefore national per capita NFF=0). Finally, concerning the regional gains from public spending, the approach adopted by all our sources and ourselves is the one known as the benefit approach (for alternative approaches, see Ruggeri, 2010) which focuses on the actual beneficiary of spending. As it is known, this latter is not always residing in the region where expenditure is formally recorded, like in the case of general public services concentrated in Lazio, the region of the capital Rome, but actually regarding all residents throughout the country.

### 3.2. Data

The Data Appendix collects six Tables displaying the data on regional per capita public revenues and expenditures (yearly averages on 11 periods between 1951 and 2010) that we employ in this section and the following ones. The figures reported in Tables A1 to A6 are derived from original data supplied by the source papers after suitable manipulation. All of them are converted from Liras current values into constant 2010 Euros values through a national-wide GDP deflator.

The data drawn from Tarquinio (1969) for the period 1951-1965 are definitely the most difficult to be made homogeneous with other information. Regional revenues are originally constituted by cash inflows to Provincial Treasuries of the Ministry of Economy and Finance, i.e. taxes on personal income, business activities, production, consumption, customs, revenues from lotteries and public monopolies. Similarly, expenditures are calculated as the regional sum of the payments made by Provincial Treasuries of the Ministry of Economy and Finance. As revenues and expenditures pertaining to the Central Treasury of the Ministry of Economy and Finance are left out, we correct the original data by adding to revenues and expenditures of Provincial Treasuries a share (proportional to the population residing in the region) of the overall amount revenues and expenditures of Central Treasury. In addition, since Tarquinio (1969) also omits capital expenditures, we proceed to a further adjustment by estimating the missing items. To do that, we use data from Ministero dell'Economia e delle Finanze (2011) and Picci (2002): we retrieve from the former (Table 22, p. 50) the shares of current and capital public expenditure for years between 1950 and 1970 so as to estimate the total capital expenditure, and then attach to each region a share of it according to the estimated allocation of public investments among Italian regions in years between 1948 and 1969 (Picci, 2002, pp. 32-34). This procedure yields reasonably reliable estimates of *total* regional revenues and expenditures which are the basis for calculation of the per capita data reported in Table A1.

Table A2 reports data relative to years 1971-73 originally presented in Forte *et al.* (1978). Tables A3, A4 and A5 summarize the same kind of data for years 1983-85, 1986-89 and 1990-92 retrieved from ISTAT (1996). Unlike Tarquinio (1969), the more refined detail of information allows in these cases to distinguish not only between current and capital expenditures but also to single out social security revenues and expenditures. As a consequence, Tables A2 to A5 show both total regional NFFs (total revenues minus total expenditures) and “Net of social security” regional NFFs (tax revenues minus total expenditures plus social security payments). Table A6 collects data from Fondazione Agnelli (1998) for the year 1995, Arachi *et al.* (2010) for years 1996-2002, Staderini and Vadalà (2009) for 2004-2006 and Arachi *et al.* (2013) for 2007-2010. Since Fondazione Agnelli (1998) does not supply data on social security payments, these are supposed to be equal in per capita terms to the values of 1990-1992. In Table A6 no distinction is made between social security and other items for both payments and revenues, since the source papers do not supply these details. Finally, in accordance with data presented in Arachi *et al.* (2010) and Arachi *et al.* (2013), only data on net fiscal flows are shown for 1996-2002 and 2007-2010.

Data of Tables A1 to A6 are the basis to build up the series of yearly averages of regional NFFs in absolute Euro 2010 values reported in Table 1. These values are adjusted for aggregate budget surpluses or deficits (i.e. modified as explained above to make aggregate surplus/deficit equal to zero), in order to highlight the inter-regional redistribution operated through the public sector, regardless the occurrence of aggregate primary surpluses or deficits. Table 2 shows the NFFs in absolute Euro 2010 values for four macro-regions<sup>12</sup>, also reporting both per capita and NFF/GDP ratios.

<< TABLE 1 >>

<< TABLE 2 >>

### 3.3. Results

To have a first glance on the outcome of our reconstruction, we can look at Table 2 and Figures 1a,b and 2a,b<sup>13</sup> where the time paths of NFFs (in 2010 billion Euros absolute and per capita values) for the four macro-regions are displayed. The figures show that the evolution of NFFs over time is characterized by the following major features:

*a)* despite the multiplicity and heterogeneity of sources, NFFs of all macro-regions follow a consistent and relatively smooth pattern throughout the whole period;

*b)* a strong and continuous (at least until the end of the 1990s) increase in the absolute values of NFFs and an apparent deepening of redistribution in favor of the South takes place over time;

*c)* North-West and Mezzogiorno increasingly assume opposite roles as structural donor and recipient, while North-East and Centre are initially neutral and turn out to appreciably contribute from mid-1970s onwards. More precisely, both absolute and per capita values of Mezzogiorno NFFs follow a U-shaped curve with the trough in the second half of the 1990s, while North-West shows a symmetrically opposite evolution. For the other two macro-regions the variability of NFF indicators is definitely lower. North-East initially exhibits NFFs close to 0 in terms of both absolute and per capita values while later on, between 1984 and 1999, the trend is increasing. Since 1999 the NFF of this macro-region again shrinks in both absolute and relative terms. Finally, for the regions of Centre, the NFF is negative and close to the figures of Mezzogiorno up to the beginning of the 1970s; then it turns

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<sup>12</sup> The geographical aggregation of Italian regions in “Macro-regions” presented here is often used in the literature. It splits the country in four parts named North-West (Piedmont, Aosta Valley, Lombardy, Liguria), North-East (Veneto, Trentino Alto Adige, Friuli Venezia Giulia, Emilia Romagna), Centre (Tuscany, Umbria, Marche, Lazio) and Mezzogiorno.

<sup>13</sup> Figures 1a and 2a show the time dynamics of actual values, while figures 1b and 2b present the Kernel-weighted local polynomial smoothing for each macro-region.

to be positive and increases steadily throughout the period. Finally, in the last four years (2007-2010), the NFF becomes greater in Centre than North-East.

<< FIGURES 1a,b – 2a,b>>

Following the most common approach in the literature, our data on NFFs do not include the payment of interests on public debt, as recalled before. However, it is important to bear in mind that the share of public bonds held by residents in Mezzogiorno has been much lower than the one belonging to Northern residents over the whole period 1951-2010. This obviously implies that Southern regions have always benefitted from lower interest payments by the State than other macro-regions, as we document in Table 3 (the average value of interests paid in the Centre-North is set equal to 100; only selected years are reported due to data availability). Augmenting NFFs with public outlays connected to interest payments could presumably affect the shape of curves in Figures 1a,b and 2a,b in a significant way thus downsizing the actual extent of interregional redistribution (Giannola and Scalera, 1995).

<< TABLE 3>>

#### **4. Mezzogiorno NFFs and regional disparities: a weak link**

The evolution of NFFs described by Figures 1a,b and 2a,b, showing a striking increase of interregional unbalances between the second half of the 1970s and the end of the 1990s, followed by a significant reduction in the last decade, raises (at least) two important points. The former concerns the possible link between the observed dynamics of NFFs and the Southern gap in both per capita income and other indicators of economic and social development. The latter regards the assessment to give of the size of interregional redistribution over the six decades under consideration, taking into account the disparities in initial economic conditions between Mezzogiorno and the rest of the country. The present section is devoted to discuss some aspects of the first issue, while section 5 will deal with the second topic.

A plausible rationale for the NFFs dynamics is connected to the implementation of regional policies, aiming at filling the historical North-South gap, and possibly implying the transfer of large

amounts of financial resources to Mezzogiorno<sup>14</sup>. Behind this conjecture there is the idea that the rise in North-South transfers may have served the purpose of reducing the social and economic gap of Mezzogiorno by financing the needed productive investments; alternatively, increasing NFFs may have been simply the other side of the coin from excess consumption in the South. The evidence of NFFs evolution through time, and the inspection of facts and data on the most salient points of the progression of the North-South gap during the considered period, cast doubt on the existence of a connection between interregional imbalances and the path of economic convergence/divergence among Italian regions. Rather, the drift observed in transfers to Mezzogiorno seems to follow the prevailing tendency to an escalating public expenditure, led by the inception and consolidation of regional governments and characterized by a substantial reduction in the share of capital to total public expenditure.

To develop this point, it can be useful to look first at Figure 3, displaying the time path of Mezzogiorno relative per capita GDP (100 is the national average) for the period 1951-2010. By and large, the picture allows identifying four different phases in the process of regional convergence/divergence in Italy, the turning points being related to changes in the nationwide economic cycle and development policies' switches.

### << FIGURE 3 >>

Phase 1: Convergence. From (late) 1950s to the early 1970s, the only period of substantial and long-lasting regional convergence among Italian North and South takes place. The so-called Italian “economic miracle” of those years happens while the policies of the “Intervento Straordinario” (Special Aid Program) lead Mezzogiorno to start industrialization and significantly reduce its development gap. In this period, regional policies are characterized by centralized (at a national level) governance and a strong supply-based stance, typically following a “top-down” approach<sup>15</sup>.

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<sup>14</sup> A rise in total investment expenditure in Mezzogiorno connected to the implementation of regional policies has to be backed by increases in one or more of the following: domestic private saving, domestic public saving and outside saving. This latter includes in turn public (NFFs) and private (mainly, direct investments by firms and financial flows by banks) components. To the extent that domestic saving falls short of total investment, transfers from outside are needed. On an application of national accounting methodologies to the case of Mezzogiorno unbalance, see Savona (2010).

<sup>15</sup> During this phase, the Mezzogiorno National Agency (*Cassa per il Mezzogiorno*) was responsible for both planning and funding interventions. The *Cassa per il Mezzogiorno* was established in 1950 by Law n. 646. The main programs within industrialization policies concerned: a) public investment in infrastructure, b) public investment in state-owned enterprises; and c) the funding of private investment through both capital and interest subsidies. In 1984 the *Cassa* was dismissed and

Phase 2: Stability. After the relative GDP reaches its maximum value in 1972-74, in the following decade the nationwide economic slowdown coincides with a phase of stability in regional disparities, with Mezzogiorno going through a progressive rundown of industrial investments and a fall in relative productivity. Overall, for the whole 1980s, Italian regional policies were driven by the idea that supporting local demand was expected to boost local industrial activities and create local supply. However, this strategy failed due to the strong economic dependence of Mezzogiorno on Northern regions: higher local demand in the South, far from stimulating local supply, led to increased imports from the North, thus crowding out local industrial activities (Del Monte and Giannola 1997).

Phase 3: Divergence. In the decade from mid-1980s to the end of the 1990s, while the Italian economy experiences a stage of sluggish recovery, the North-South gap deepens. In 1992 the Special Aid Program is abolished and replaced by ordinary regional policies operating for all depressed areas in the country (Law n. 96/1993). The focus of regional policy is therefore shifted from a view privileging “imported development” toward the stance of “exploitation of internal resources”. This “bottom-up” approach, focusing on local systems of small and medium-sized firms mostly operating in traditional industries, is based on the idea of “endogenous” development to be triggered by active participation of local agents in the policies’ programs. In this view, public support to local demand is expected to foster local supply and boost local industrial activities: this justifies fiscal incentives to firms, income subsidies for households and job creation measures in the public sector (especially Regions).

Phase 4: Stability (again). From the end of the 1990s onward, the North-South output gap remains substantially steady, at a level barely higher than in the 1950s. Supply-side interpretations of Italian dualism re-gain attention among scholars and policy makers, promoting a switch to policies based on both incentives for private investments and productive public spending. Such a new policy switch leads to the so-called “Nuova Programmazione” (New Regional Policy) whose emphasis is on the role played by context factors and social capital as the main endogenous factors to enhance in order to boost up local development and increase attractiveness for foreign investments. In these years domestic regional policies are designed in compliance with the European Cohesion Policy framework<sup>16</sup>.

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replaced in 1986 by the new *Agenzia per la promozione e lo sviluppo del Mezzogiorno* which was in turn abolished in 1992 by Law n. 488.

<sup>16</sup> In years 2000-2006, the whole Mezzogiorno, with the only exceptions of Abruzzo and Molise, belonged to the group of Objective 1 regions, the ones having per capita GDP lower than 75% of European average. In the programming period 2007-2013, Calabria, Campania, Apulia and Sicily were included in the “Convergence Objective” (formerly Objective 1); Basilicata in “Statistical phasing-out”; Sardinia in “phasing-in”; Molise and Abruzzo in “Competitiveness and Employment



To focus on the relationship between the path of convergence/divergence and the dynamics of NFFs, Table 4 considers the ratio  $RRII \equiv \frac{GDP_{it}}{GDP_{at}}$  as an indicator of regional relative development, where the subscripts  $i$ ,  $t$  and  $a$  respectively stand for region, time and national average value. Calculating coefficients of linear correlation between on one side absolute and percentage changes in  $RRII$ , and on the other side regional NFFs (a) in absolute per capita terms, (b) as a ratio to regional GDP, and (c) as the natural logarithm of that ratio, considering both current and lagged values, we verify that no significant correlation emerges at the usual threshold of 5% confidence. The same conclusion is confirmed by an inspection of Figure 4, where percentage changes in  $RRII$  are contrasted to lagged per capita NFFs and lagged natural logarithms of NFF to GDP ratios: both the scatter plots (as well as the ones relative to similar comparisons, here not shown for brevity) depict a point cloud without any hint of a possible relationship between net fiscal flows and relative GDP growth.

<< TABLE 4>>

<< FIGURE 4>>

Tables 5 to 7 focus on other specific salient aspects of the North-South gap. Table 5 reports indicators of aggregate productivity, accumulation and industrialization rates over the considered period (figures are expressed in relative terms; 100 is the national average), highlighting a pattern of significant improvement experienced by the Southern economy in the first phase of convergence, followed by a relative decline. Likewise, figures reported in Table 6 and 7 emphasize the persistence of the Italian dualism considering socio-economic facets of the gap. According to Table 6, the share of households in poverty is nowadays still significantly higher in the South than in the rest of the country. Disaggregated data on the Human Development Index (Felice and Vasta, 2012) reported in Table 7 confirm that in Italy, even from the more general perspective of socio-economic development, the regional convergence came to a halt in the 1980s.

<< TABLES 5-7>>

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Objective”. In the programming period 2014-2020 Basilicata, Calabria, Campania, Apulia and Sicily belong to the so called “less developed regions” (per capita GDP lower than 75% of EU-27 average), while Abruzzo, Molise and Sardinia are considered “Transition regions” (per capita GDP between 75% and 90% of EU-27 average).

From the scrutiny of the events occurred throughout the four phases of Mezzogiorno convergence/divergence and the examination of Figures 3-4 and Tables 4-7, the link between the dynamics of regional NFFs and the evolution of the North-South gap appears quite faint. Indeed, for the first three phases, there is no evidence that increasing NFFs have been accompanied by a reduction in the gap: actually, on one side the sustained process of regional convergence of the 1950s-1970s was achieved at the cost of moderate interregional transfers; on the other, the gap widened just in correspondence to larger and increasing NFFs. Finally, in the last phase (from the mid-1990s onwards), a stable or slightly decreasing gap has been matched by shrinking NFFs.

While the evidence does not seem to support the hypothesis that the increase (and the subsequent decrease) of NFFs be somehow connected to the evolution of indicators of any kind of socio-economic North-South gap, other features of the evolution of Italian public expenditure may help to explain the deepening of Mezzogiorno imbalances and to some extent even the reasons of its scarce impact on the North-South gap.

These are the institutional break connected to the establishment of “Regioni a Statuto Ordinario” (Regions) occurred between 1972 and 1977 and the substantial reduction in the share of capital to total public expenditure taking place over the entire considered span of time and especially since the early 1980s.

The decentralization of expenditure responsibilities at a regional level can be sensibly regarded as one of the main determinants of the structural changes occurred in public expenditure in these years, and a likely major reason of the rise in NFFs. By mid-1970s, an overhaul of local government financing system took place, characterized by a strong decentralization of expenditure (due to the attribution of health, transportation and other expenditures to Regions) and a contemporary centralization of revenues from municipalities to the national government. The two main consequences of this break are a noteworthy rise in the local governments’ share on total primary current expenditure and above all a massive expansion of overall public expenditure. Starting from this latter, Giarda (2011, Table 1, p. 6) documents that the primary expenditure of public administration (central and local governments) was about 22% of GDP in 1951, 32% in 1970, 43% in 1990 and 47% in 2010. Compared to the doubling of the national expenditure/GDP ratio, the growth of Mezzogiorno NFF, rising from 10-13% of local GDP in the 1950s-1960s to 22% in the 1990s, seems no longer enormous, while its roots appear to be somehow connected to the overall drift of public expenditure. Secondly, according to Giarda (2011), the local governments’ share of public primary expenditure rose from 19% (1951) to 25% (1980) and further to 32% in 2008. At the same time, between 1951 and 1980, the local

governments' share of own taxes on total revenues shifted from 63% to 10%, to recover to 40% only much later in 2009, after the season of fiscal federalism which drove back to local governments a larger share of public revenues. The “decentralization without accountability” formula adopted by the Italian legislator in the 1970s may have fostered a condition of soft budget constraint that the literature has proved to be highly detrimental for fiscal discipline (Rodden *et al.*, 2003). This can be considered an important source of the large fiscal deficits of local governments, escalating deficits by the overall public sector and heavy imbalances of Southern regions occurred in the following decades<sup>17</sup>.

The other salient feature of the Italian public expenditure evolution over the considered decades is the shrink of the capital component. Looking again at Giarda (2011), we learn that between 1951 and 2010 the current primary expenditure of public administration increased from 81% (1951) to 84% (2010) of total expenditure and interest payments rose from 4% to 9%. On the other hand, capital expenditures were progressively reduced from 15.4% (1951) to 10.8% (1980) and 6.8% (2010), with the local governments' share rising from 20% to 59% and then 61%. Since the capital component of public expenditure is obviously the most relevant to development and regional policies, its reduction, and the simultaneous decentralization at a sub-national level may help rationalize the evidence of a not substantial effect of NFFs on the North-South gap. In this vein, Tables 8 and 9 provide some suggestive information on the amount of resources allotted to Mezzogiorno by regional policies from 1951 to 2008. Table 8 shows that the financial effort of regional policies has increased up to mid-1970s and decreased afterwards, depicting a path much more similar to the evolution of the gap than the dynamics of Mezzogiorno NFF. In percentage of national GDP, resources deployed for public intervention in Mezzogiorno increased from 0.73% in 1951 to 1.32% in 1980. The decreasing trend experienced in the following years occurred in correspondence with: the progressive decline of the activities of “Cassa per il Mezzogiorno” in the 1981-1986 period (1.19%), the ending of extraordinary intervention in 1987-1993 (1.10%), and the beginning of the so called ordinary intervention for depressed areas in 1994-1998 (0.74%). By distinguishing between “public investment and business incentives” and “payroll tax reductions”, Table 8 emphasizes the switching occurred in regional policies from supply side interventions to demand-targeted measures aimed at stimulating the Mezzogiorno economy by means of fiscal subsidies to firms and income support for households (as well as job creation measures in the public sector). Such a change, mirrored in the increase of public resources assigned to payroll tax

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<sup>17</sup> This statement is based on the well known common pool argument, which has been applied to a local/central government framework by several authors. See for example Weingast *et al.* (1981), Velasco (2000), Pisauro (2001) and Rodden (2006).

reductions observed since the early 1970s contributed to make financial transfers less effective in reducing the Southern gap.

Supply-side interpretations of Italian dualism regained room in the late 1990s and the “Nuova Programmazione” promoted a renewal of supply-side policies based on both incentives for private investment and productive public expenditure (Erbetta and Petraglia, 2011). Nevertheless, even in the last years, a substantial decline in capital public expenditure in Mezzogiorno has taken place, with business incentives falling from about 50% of total expenditure in 2001 to around 35% in 2008 and public investment falling below 35% (Table 9).

#### <<TABLES 8-9>>

Finally, concerning the effects of decentralizing capital expenditures, Scalera and Zazzaro (2010) point out the failures involved by design flaws of regional policies implemented in the 1990s and poor skills of local bureaucracies, while Mauro and Pigliaru (2013) argue that the effectiveness of public investments is related to the local endowment of social capital: if this latter is lower than the national average level (as it happens in Mezzogiorno), a project managed by central government institutions is more productive and conducive to growth than one managed by local institutions. This result is in line with the empirical evidence on the role of government quality in mediating the relationship between fiscal decentralization and regional disparities. In principle, fiscal decentralization has the potential to reduce income differences across regions but this potential may not produce effective results due to governance problems associated with sub-national authorities. In particular, fiscal decentralization will promote regional convergence only in high government quality settings, while it will magnify regional disparities in contexts with poor governance (Kyriacou *et al.*, 2013).

Summarizing, the prominent upsurge of NFFs in 1980s and 1990s seems to have exerted a negligible impact on the North-South gap because it has not been connected to a stronger commitment in supply-side regional and development policies with the needed rise of capital expenditure in Mezzogiorno. Rather, the increase of NFFs seems due mainly to a generalized escalation in the overall primary expenditure probably related to the “decentralization without accountability” design of the fiscal reforms of 1970s, privileging current over capital expenditure.

### **5. An assessment of interregional redistribution. Too much money to Mezzogiorno?**

In the last two section, we saw that over the considered six decades the size of NFFs has remarkably increased while, especially after mid-1970s, the effects on the growth of Mezzogiorno and the welfare of its residents have been fairly small, mainly because the features of the escalation in public expenditures have been little functional to the purposes of regional policies. The evidence of relatively worthless transfers has therefore supplied the underpinning for a sharp critique against interregional unbalances: given that NFFs have shown to be little useful to closing the gap, why not reducing them substantially? In what follows, we seek to give an assessment of the size of interregional redistribution based upon indexes and analytical procedures intensively used in the literature. Our basic idea is that the judgment on the adequateness of redistribution has to be driven by the consideration of actual inequalities, in the face of the public commitment to reduce regional disparities and the constitutional principles of equal access to the basic public services, taking also in account comparisons with the extent of interregional redistribution occurring in other countries. We believe that the evidence of a scarce actual impact of redistribution on the North-South gap in the past is not a good argument to call for a drastic cut in transfers. Past failures should rather stimulate the search for more effective policies for rebalancing geographical disparities than be used as an excuse for egoistic localism.

Figure 5 displays the relationship between regional per capita NFFs and per capita GDP between 1951 and 2010. The four graphs refer to different time intervals, i.e. the whole period 1951-2010 in the top left, and the three sub-periods 1951-90 (top right), 1984-2010 (bottom left) and 1991-2010 (bottom right). As shown in the top panels, the link between regional income and fiscal balances has been weak on the whole and particularly for the first four decades<sup>18</sup>. This evidence is partially contrasted in the bottom panels, indicating a stronger relationship for the last two decades. From the mid-1980s onwards, more affluent regions start recording significant increases in NFFs: an additional per capita euro involves a rise of about 35-40 cents in per capita NFFs.

#### << FIGURE 5 >>

The descriptive evidence just described is made more significant by estimating the Bayoumi and Masson (1995) and Bosch *et al.* (2002) equations on the same dataset. Bayoumi and Masson (1995) estimate the size of territorial redistribution by studying the relationship between regional disposable

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<sup>18</sup>  $R^2$  values are low for the whole sample regression and for the sub-period 1951-90. For this latter reason the regression coefficient is not significantly different from 0. Regression residuals for the whole period 1951-2010 take negative average and median values for all Southern regions (and Umbria), and particularly for Calabria and Basilicata.

income after public revenues and expenditures have taken place (i.e.  $y_i^d = GDP_i - NFF_i$ ) and initial regional income  $GDP_i$ . Dividing these variables by average values to normalize, and taking logarithms we get the equation to estimate:

$$\ln \frac{y_{it}^d}{y_a^d} = \alpha + \beta \ln \frac{GDP_{it}}{GDP_{at}} + e_{it} \quad (1)$$

where the subscripts have the same meaning as in section 4. The estimated value for  $\beta$  can be used to account for the redistributive impact of public finance. As a matter of fact, if an increase of 1% in  $\frac{GDP_i}{GDP_a}$  involves a corresponding increase of 1% in  $\frac{y_i^d}{y_a^d}$ , then the redistributive impact is zero, whereas when the increase of  $\frac{y_i^d}{y_a^d}$  is only 0.7%, then redistribution can be assessed at 30%. Therefore  $(1-\beta)$  represents the size of redistribution brought about by interregional fiscal flows.

A complementary way to accomplish the task of assessing the redistributive impact of fiscal flows is the estimation of the Bosch *et al.* (2002) equation:

$$\ln \left( 1 - \frac{NFF_{it}}{GDP_{it}} \right) = \theta + \gamma \ln \frac{GDP_{it}}{GDP_{at}} + e_{it} \quad (2)$$

where  $\gamma$  (the income elasticity of NFFs) is again a measure of the intensity of redistribution. In the presence of a redistributive function for NFFs, we expect that  $\hat{\gamma}$  takes negative values: the higher its absolute value, the stronger impact of fiscal flows<sup>19</sup>.

Table 10 summarizes the results of estimation of the two equations (the first six columns refer to equation 1; the last six columns to equation 2) for both the whole period 1951-2010 and the sub-period 1984-2010, during which the extent of NFFs has become more significant. Over the entire span of time 1951-2010, the extent of redistribution turns out to range from 8% (FE estimates) to 35% (OLS estimates). Since, according to the Hausman test reported in the eighth row of the Table, FE should be preferred to the other two kind of estimations, we can conclude that over the whole period 1951-2010 the redistributive impact of public financial flows can be deemed rather weak. On the other hand, the picture is somewhat different when only the last 25 years are taken into consideration, since now redistribution looks more substantial in any of the three estimations presented. In particular, in the case

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<sup>19</sup> Bosch *et al.* (2002) show that there is a precise relationship between  $\beta$  of equation (1) and  $\gamma$  of equation 2, i.e. the redistributive power  $(1 - \beta)$  is equal to  $-\gamma$ .

of RE estimates, i.e. the ones more appropriate according to the Hausman and Breusch and Pagan tests, the redistributive impact of public financial flows is estimated around 44%.

#### << TABLE 10 >>

Although comparisons with other studies and other countries require the due circumspection, weighing this result against most of the existing literature confirms that the intensity of interregional redistribution in Italy can be judged relatively limited. The size of redistribution through public fiscal flows is around 40% (average over several countries) for MacDougall (1977); 30% for Spain in Castells *et al.* (1981); 39% for Canada and 22% for the United States according to Bayoumi and Masson (1995); 38% in France, 26% in UK, 18% in Canada and 16% in the USA in Mélitz and Zummer (1998); 40% for Germany in Duboz and Nicot (1998); 45% on average in several European countries, for Castells (1998). More recently, Barberán *et al.* (2000), estimating equation (1) for Spain in 1991-96, evaluate between 32% and 38% the redistributive power of the activity of the Spanish central public administration. Bosch *et al.* (2002) evaluates redistribution as follows: 28% for Australia in 1985-1999, 33% for Spain in 1991-1996, 18% for the United States in 1981-1998 and 5% for the European Union in 1986-1999. Rodden (2010) estimates the redistributive power of public grants between 1990 and 2005 as follows: less than 10% in Argentina, Brasil, India, United States and European Union; between 10% and 20% in Australia, Germany and Spain; around 23% in Canada. Finally, Decressin (2002) and Arachi *et al.* (2010) use similar estimates to assess the extent of redistribution in Italy respectively in the periods 1983-1992 and 1996-2002; the former find that the redistributive power of fiscal flows is around 24% while for the latter the estimate is about 28%.

Another aggregated index of redistribution we consider is the Pechman and Okner (1980) index  $I_{PO} = \frac{G_{GDP} - G_{yd}}{G_{GDP}}$ , measuring the proportional change in the Gini index  $G$  due to public expenditure and taxation. Assuming that the public sector activity does not increase income concentration, i.e.  $G_{GDP} \geq G_{yd}$ , given the properties of the Gini index, it follows  $0 \leq I_{PO} \leq 1$ , with redistribution intensity increasing in  $I_{PO}$ . Figure 6, depicting the time path of the Pechman and Okner index for all regions and the four macro-regions alone, confirms that redistribution intensity follows the dynamics of NFFs, first increasing and then decreasing over time. Notably, the overall impact on concentration turns out to be stronger across all regions than the macroregions alone, a hint that not negligible redistribution occurs within the set of Northern and Central regions as well.

An additional important piece of information on the actual burden imposed to residents of contributing regions is supplied by Figures 7a,b where the ratios of NFFs over regional GDPs are shown for the four macro-regions. While not surprisingly North-West turns out to be the macro-region with the most significant contribution to interregional transfers relative to its own GDP, its role in nourishing the redistribution toward Mezzogiorno appears to significantly declining over time. As a matter of fact, from 1980s onward (and particularly in 2007-10) the weighted-by-GDP contribution of North-West to transferring resources to the South comes out to be less than in 1950s-1960s. Concerning North-East, the weight of NFF on its own GDP remains always rather low, within 6%, even in the 1980s and 1990s when absolute and per capita transfers significantly increase. Concerning Centre, from 1972 onward its NFF/GDP ratio is always very close to North-East and at the end of the period it is about 5.13%, not much lower than the value of North-West (7.43%).

#### << FIGURES 6-7>>

Finally, a judgment about the magnitude of interregional redistribution cannot fail to consider: on one side the constraints that constitutional principles of citizens' equality impose to governments to guarantee an amount and a quality of public goods pretty uniform across regions, even in the presence of significant differences in the regional ability to self-finance those public goods; on the other, the obvious link that a progressive taxation system establishes between differences in regional GDPs and differences in regional fiscal revenues. To take into account these aspects, we set up Figure 8 and 9. Figure 8 shows the relative values of per capita public expenditures in the four macro-regions between 1971 and 2006. The graph points out that while in the 1970s per capita public expenditure is higher in Mezzogiorno than in all the other macro-regions, from the beginning of the 1980s, it is steadily below the national average, with the difference increasing over time (in 2004-06, more than 5% with respect to Italy and about 8% with respect to the North). Conversely, per capita public expenditure in North-West and North-East is almost always above the national average, whereas in the Centre it is increasing throughout the period: lower than in all the other macro-regions until the end of the 1990s but higher in 2004-06.

Figure 9 illustrates the time path of the ratio actual/normal per capita tax revenues, where normal per capita tax revenues are calculated as the personal income tax (IRPEF) payment owed on an income equal to average regional GDP. In order to reckon the macro-region normal tax revenues, we assume that the taxpayer is a household with two children and both parents employed, with an income equal to



the macro-region GDP. Then, by making use of the procedure implemented at the website <http://www.dossier.net/irpef/calcolo-irpef.htm>, we calculate her tax bill. Tax rates and family tax credits refer to fiscal year 2012. For example, the taxpayer North-West 1971-73 has a taxable yearly income of 16,891 Euros, a tax credit of 677 Euros and a theoretical tax bill of 3,284 Euros. The ratios actual/normal per capita tax revenues so obtained are finally normalized by setting the value of the ratio for Italy equal to 1. The inter-regional comparison shown in Figure 9 points out that (except in the 1970s) the ratio is always well above the national average in macro-region South (at least 5% higher from the 1990s onward). In North-West and Centre the ratio is steadily close or just above the average (around 4% higher in North-West), while in North-East it is permanently lower (more than 15% lower from 1995 onward). This evidence confirms that while in absolute terms per capita values of tax revenues in Mezzogiorno are always significantly lower than in the other macro-regions, due to the lower income of this area, the Southern citizens end up with paying considerably more than they would if overall fiscal revenues were shaped by the same progressivity involved by IRPEF personal income tax.

Summarizing, we believe that the evidence supplies little ground for extreme judgments on the extent of interregional redistribution. While in fact in absolute terms the amount of transferred resources is significant and strongly increasing over time (at least up to the end of the 1990s), many indicators show that the impact of redistribution can be deemed to be moderate considering the severity of regional income differences and the reasonable burden imposed to contributing regions.

<< FIGURES 8-9 >>

## **6. Concluding remarks**

This paper carries out a long-run reconstruction of the pattern of interregional redistribution in Italy. In particular, by resorting to different sources, a discontinuous time series of NFFs for Italian regions and macro-regions from 1951 to 2010 is built up. The evidence collected is the basis to put forward on one side an interpretation of the dynamics of NFFs and the North-South gap and on the other an assessment on intensity and adequacy of redistribution in the light of actual regional inequalities and the constitutional principles of citizens' equality.

Both the analysis of data and the inspection of facts indicate that the relationship between interregional redistribution and regional convergence is definitely weak. This supports the view that redistribution through increasing NFFs has little served the purpose of regional catching up: the

sustained process of regional convergence of the 1950s-1960s has occurred in years with relatively modest interregional transfers, while the North-South gap has widened just in correspondence to larger NFFs in the 1980s and 1990s. We have discussed possible determinants of this unfavorable outcome (increasing NFFs and no convergence): the escalation of overall public expenditure connected to the expenditure decentralization occurred in the 1970s with the creation of “Regioni”, the change in the composition of public expenditure (more current and less capital expenditure), the decentralization of capital expenditure responsibilities. On the role of these factors as well as on the weight of design flaws of regional policies implemented in the last couple of decades in impairing the ability of redistribution to activate a virtuous process of convergence among Italian regions, more careful quantitative investigation is needed and we leave it for future research.

Finally, we have applied a number of indicators to our newly constructed dataset in order to assess the intensity of redistribution in favor of Mezzogiorno, and its adequacy, taking into account the differences in interregional GDPs which justify public intervention. Our main conclusion is that Mezzogiorno has benefited from large and increasing levels of transfers of public resources, but nevertheless the intensity of redistribution can hardly be judged excessive.

## **TABLES AND FIGURES**

**Table 1. Regional net fiscal flows in Italy, average values, 1951-2010, billions of 2010 Euros.**

Regions	1951-57	1958-61	1962-65	1971-73	1983-85	1986-89	1990-92	1995	1996-02	2004-06	2007-10
Piedmont	2.050	2.062	3.555	5.957	5.321	7.433	8.127	7.509	6.719	4.409	6.292
Aosta Valley	0.000	-0.019	-0.032	-0.009	-0.331	-0.358	-0.274	-0.522	-0.624	-0.560	-0.087
Lombardy	8.341	10.699	12.751	16.964	27.242	31.307	35.609	42.145	45.235	43.550	24.222
Trentino A. A.	-0.204	-0.082	-0.154	0.016	-1.591	-0.950	-1.434	-3.013	-1.669	-1.901	-1.128
Veneto	0.593	0.063	0.066	0.716	5.244	5.622	7.398	12.986	11.149	9.054	3.585
Friuli V. G.	-0.137	-0.042	0.272	-0.669	-0.479	-0.655	0.012	-1.373	-0.143	-0.474	0.869
Liguria	2.837	3.243	3.646	1.510	-0.793	-0.798	-0.870	-3.178	-2.117	-2.460	2.714
Emilia Romagna	0.826	1.478	0.598	1.092	4.555	5.078	6.130	9.758	11.493	9.551	8.610
Tuscany	0.301	-0.167	0.000	-0.164	2.639	1.438	1.411	1.142	0.973	2.595	2.491
Umbria	-0.233	-0.416	-0.492	-0.719	-0.955	-1.188	-1.286	-1.868	-1.663	-1.905	0.029
Marche	-0.066	-0.203	-0.028	-0.653	-0.479	-0.734	-0.624	-0.326	-0.514	-0.168	-0.552
Lazio	-7.150	-2.929	-7.666	3.092	4.542	8.456	8.283	11.045	9.225	11.861	13.604
Abruzzi	-0.423	-0.871	-0.764	-1.956	-3.044	-2.310	-2.236	-2.659	-2.520	-2.191	-1.600
Molise	-	-	-	-0.681	-1.101	-1.069	-1.156	-1.348	-1.331	-1.342	-0.639
Campania	-1.053	-2.542	-2.195	-4.332	-10.043	-13.377	-13.996	-16.060	-19.574	-16.715	-18.345
Apulia	-1.135	-2.405	-1.990	-5.547	-6.385	-6.938	-7.854	-10.802	-12.625	-11.412	-9.737
Basilicata	-0.302	-0.540	-0.500	-1.432	-2.657	-2.683	-2.665	-2.391	-2.796	-2.663	-1.735
Calabria	-0.821	-1.351	-1.304	-3.722	-5.969	-7.080	-8.223	-11.835	-10.786	-9.231	-6.988
Sicily	-2.432	-4.096	-3.957	-6.413	-11.169	-15.167	-17.312	-22.691	-22.979	-17.684	-17.221
Sardinia	-0.822	-1.667	-1.858	-3.042	-3.880	-4.016	-4.494	-6.531	-6.994	-5.696	-4.384

Source: Own elaboration on Tarquinio (1969), Forte *et al.* (1978), ISTAT (1996), Fondazione Agnelli (1998), Arachi *et al.* (2010), Staderini and Vadalà (2009) and Arachi *et al.* (2013).

Note: national aggregate NFF=0.

**Table 2. Macro-regions' net fiscal flows in Italy, averages, 1951-2010.**

		1951-57	1958-61	1962-65	1971-73	1983-85	1986-89	1990-92	1995	1996-02	2004-06	2007-10
Billions of Euros (2010 prices)	North-West	13.227	15.986	19.921	24.421	31.439	37.584	42.591	45.955	49.213	44.940	33.141
	North-East	1.079	1.417	0.782	1.156	7.729	9.095	12.106	18.357	20.830	16.229	11.936
	Centre	-7.148	-3.715	-8.185	1.557	5.747	7.972	7.784	9.993	8.020	12.384	15.572
	Mezzogiorno	-6.989	-13.470	-12.566	-27.125	-44.249	-52.640	-57.936	-74.316	-79.605	-73.797	-60.649
Per capita Euros (2010 prices)	North-West	1,096	1,248	1,466	1,625	2,070	2,484	2,850	3,066	3,263	2,918	2,152
	North-East	114	149	81	114	742	875	1,167	1,756	1,967	1,474	1,084
	Centre	-805	-402	-848	150	527	728	714	909	724	1,103	1,387
	Mezzogiorno	-387	-729	-669	-1,424	-2,150	-2,515	-2,821	-3,561	-3,811	-3,561	-2,927
Ratios to regional GDP	North-West	12.97	10.78	11.19	9.62	9.23	10.12	10.37	10.92	11.10	9.57	7.43
	North-East	1.72	1.63	0.71	0.74	3.31	3.63	4.32	5.92	6.30	4.58	3.56
	Centre	-12.65	-4.77	-8.16	1.05	2.66	3.38	3.03	3.58	2.68	3.87	5.13
	Mezzogiorno	-9.65	-13.13	-9.70	-14.00	-15.45	-16.94	-17.65	-22.26	-22.16	-19.70	-16.98

Source: Own elaboration on Tarquinio (1969), Forte *et al.* (1978), ISTAT (1996), Fondazione Agnelli (1998), Arachi *et al.* (2010), Staderini and Vadalà (2009) and Arachi *et al.* (2013).

**Table 3. Per capita interest payments on public debt in Mezzogiorno (Centre-North = 100)**

1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963
20.0	25.6	28.1	28.1	29.7	30.0	30.8	30.9	31.1	29.8	29.0	29.1	29.0
1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
19.1	19.3	20.2	19.6	18.2	18.5	17.0	20.0	18.3	18.5	18.1	17.0	14.5
1983	1984	1985	1986	1987	1988	1989	1990	1991	1992			
14.5	15.4	23.3	24.3	23.8	24.7	28.1	23.6	20.9	18.6			
2003	2004	2005	2006	2007	2008	2009	2010	2011	2012			
33.5	27.9	34.3	34.8	33.9	32.9	29.6	31.1	32.4	31.8			

*Sources:* For the years 1951-1963 total expenditure for interest payments has been attributed to the two macro-regions according to the distribution of the stock of public debt owned by residents (Manfredi, 2008). For the 1970-1992 period: Magnani (1997). For the 2003-2012 period total expenditure has been attributed to the two macro-regions according to the distribution of the stock of public debt owned by residents. In 1951-62 and 2003-2012 periods, residents include financial institutions and households. In 2003-2012 residents are solely households.

**Table 4. NFFs and the North-South gap. Coefficients of linear correlation**

	-NFF	-NFF_1	$\left(1 - \frac{NFF_{it}}{GDP_{it}}\right)$	$\left(1 - \frac{NFF_{it}}{GDP_{it}}\right)_{-1}$	$\ln\left(1 - \frac{NFF_{it}}{GDP_{it}}\right)$	$\ln\left(1 - \frac{NFF_{it}}{GDP_{it}}\right)_{-1}$
$\Delta \frac{GDP_{it}}{GDP_{at}}$	0.0538 (.2246)	0.0649 (.1806)	0.0962* (.0877)	0.0922* (.0971)	0.1035* (.0724)	0.1017* (.0759)
$\Delta \ln \frac{GDP_{it}}{GDP_{at}}$	0.0414 (.2803)	0.0420 (.2774)	0.0792 (.1325)	0.0716 (.1568)	0.0859 (.1132)	0.0791 (.1328)

*Source:* Own elaboration on Tarquinio (1969), Forte *et al.* (1978), ISTAT (1996), Fondazione Agnelli (1998), Arachi *et al.* (2010), Staderini and Vadalà (2009) and Arachi *et al.* (2013). *Note:* In parentheses p-levels; one asterisk (\*) stands for significant at 10% level.

**Table 5. Productivity, accumulation rate and industrialization rate in the Mezzogiorno (Italy = 100)**

Years	Productivity	Accumulation Rate	Industrialization Rate
1951	64.2	120.0	48.7
1961	65.7	156.4	45.0
1971	93.7	219.6	49.6
1981	89.7	145.1	50.1
1991	88.5	170.6	49.6
2001	85.8	133.1	50.4
2009	83.9	128.4	51.2

*Source:* SVIMEZ (2011).

*Notes:* Productivity (euro) = value added / units of labor x 1000;  
Accumulation rate (%): gross physical investment / value added;  
industrialization rate (‰): units of labor employed in the manufacturing sector / Population.

**Table 6. Households in poverty (% of total population)**

	1931	1967	1971	1978	1981	1991	2008
Italy	29.7	17.9	20.1	7.2	4.5	3.4	4.4
Centre-North	26.9	12.5	14.4	4.2	3.2	1.5	2.2
Mezzogiorno	35.0	32.8	32.8	12.7	8.7	7.3	9.2

*Source:* Vecchi (2011).

**Table 7. Human Development Index**

	1951	1961	1971	1981	1991	2001	2007
Italy	0.631	0.709	0.778	0.817	0.850	0.883	0.899
Centre-North	0.659	0.726	0.792	0.828	0.860	0.894	0.909
Mezzogiorno	0.574	0.671	0.749	0.794	0.831	0.862	0.877
Mezzogiorno/Centre-North	0.87	0.92	0.95	0.96	0.97	0.96	0.96

*Source:* Felice and Vasta (2012).

*Note:* The synthetic HDI index is constructed so as to capture three components of human life (longevity, knowledge and income) and can vary between 0 and 1.

**Table 8. Financial resources for regional policies in Italy 1951-1998 (1951-1993: extraordinary intervention in the Mezzogiorno; 1994-1998: intervention in all depressed areas)**

Years	Public investment and business incentives (a)		Payroll tax reductions (b)		Total	
	in 2008 million Euros	as % of Italian GDP	in 2008 million Euros	as % of Italian GDP	in 2008 million Euros	as % of Italian GDP
1951-1957	1,519	0.73	-	-	1,519	0.73
1958-1965	2,321	0.74	-	-	2,321	0.74
1966-1970	2,329	0.74	361	0.13	3,607	0.80
1971-1975	5,808	0.90	1,969	0.33	7,777	1.27
1976-1980	7,119	0.90	3,643	0.46	10,762	1.32
1981-1986	5,974	0.65	5,089	0.55	11,063	1.19
1987-1993	6,305	0.57	6,215	0.55	12,521	1.10
1994-1998	6,081	0.49	3,331	0.26	9,412	0.74

Source: Bianchi *et al.* (2012).

Notes: (a) From 1951 to 1993: total expenditure by Cassa per il Mezzogiorno, Agenzia per il Mezzogiorno and total payments by the central government for programs not directly controlled by Cassa per il Mezzogiorno and Agenzia per il Mezzogiorno. Data include expenditure for: general infrastructures, sector-specific infrastructures, support to private investment in the form of both capital and interest contributions and funding of “Contratti di programma”. From 1994 to 1998: total payments by the central government for intervention in all depressed areas of the country (data do not include programs financed by European funds); (b) introduced from 1968 onward.



**Table 9. Capital public expenditure in Mezzogiorno (% of national capital public expenditure, 2001- 2008)**

Years	Public Investment	Business incentives	Total
2001	35.4	49.9	41.1
2002	32.6	48.7	39.3
2003	30.6	48.1	37.5
2004	30.7	47.5	36.6
2005	32.3	45.0	36.9
2006	32.9	43.2	36.8
2007	34.0	37.7	35.4
2008	34.6	35.2	34.8

Source: Bianchi *et al.* (2012) elaboration on Conti Pubblici Territoriali.

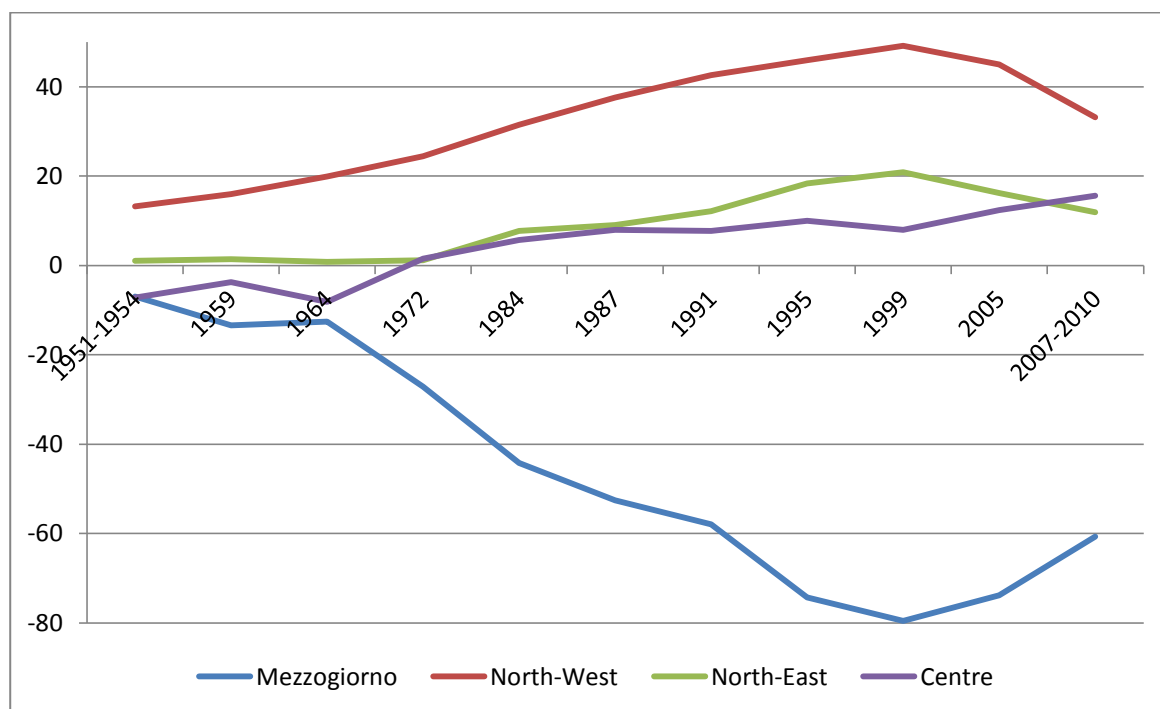
**Table 10. Redistributive power and income elasticity of NFFs.**

	1951-2010			1984-2010			1951-2010			1984-2010		
	OLS	RE	FE	OLS	RE	FE	OLS	RE	FE	OLS	RE	FE
$\hat{\beta}$	0.642275*** (0.038565)	0.670624*** (0.022680)	0.918975*** (0.075670)	0.544188*** (0.010742)	0.555833*** (0.025939)	0.615150*** (0.084091)						
$\hat{\gamma}$							-0.35772*** (0.038565)	-0.32938*** (0.022680)	-0.081025 (0.075670)	-0.45581*** (0.010742)	-0.44417*** (0.025939)	-0.38485*** (0.084091)
Constant	0.011474*** (0.001697)	0.013784** (0.006490)	0.034021*** (0.007220)	0.011554*** (0.002152)	0.012462* (0.007306)	0.017092** (0.007179)	0.011474*** (0.001697)	0.013784** (0.006490)	0.034021*** (0.007220)	0.011554*** (0.002152)	0.012462* (0.007306)	0.017092** (0.007179)
Adjusted $R^2$	0.903051		0.925765	0.931122		0.973612	0.742691		0.802974	0.904598		0.963451
F	2040.924***		137.554***	1132.175***		257.428***	633.1176***		45.6265***	1318.995***		184.2043***
Hausman		22.767***			1.154			22.767***			1.154	
Breusch - Pagan		21.285***			156.422***			21.285***			156.422***	
Observations	220	220	220	140	140	140	220	220	220	140	140	140

Source: Own elaboration on Tarquinio (1969), Forte *et al.* (1978), ISTAT (1996), Fondazione Agnelli (1998), Arachi *et al.* (2010), Staderini and Vadalà (2009) and Arachi *et al.* (2013).

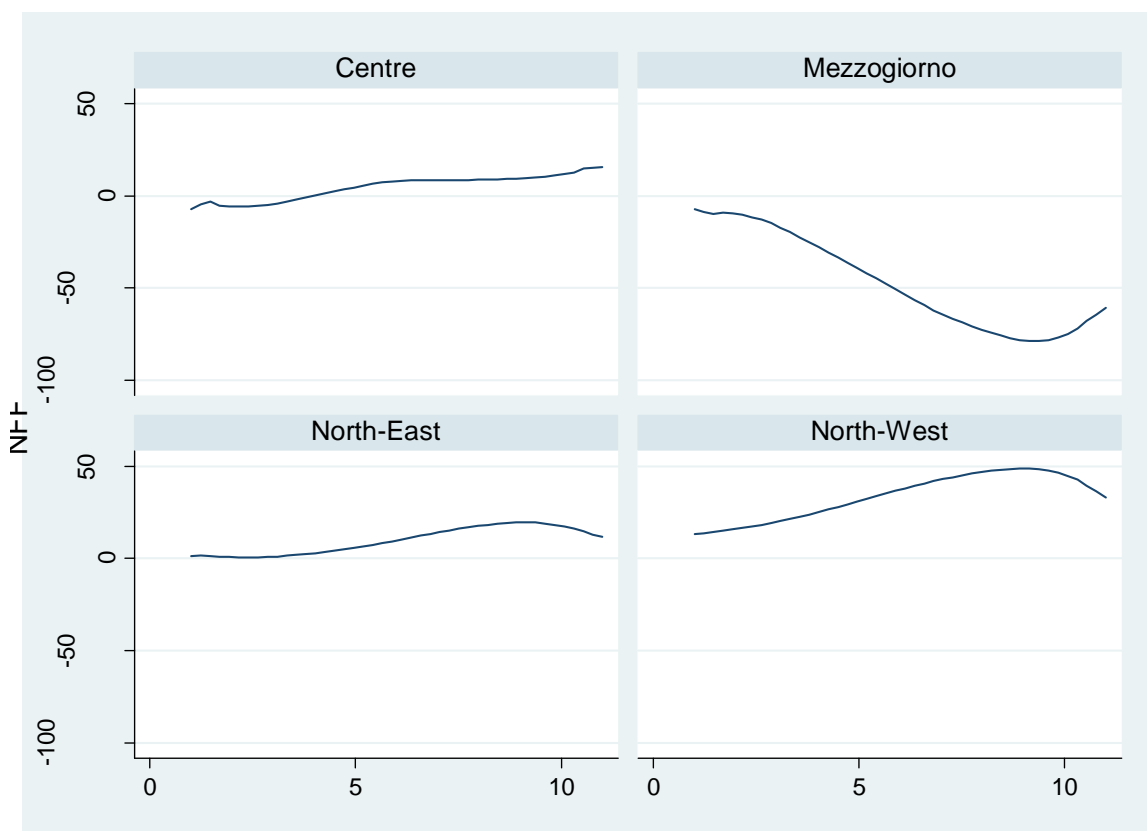
Note: (\*), (\*\*) and (\*\*\*) denote statistical significance respectively at confidence levels of respectively 10%, 5% and 1%.

**Figure 1a. Macro-regions' NFFs (2010 billion Euros), 1951-2010.**



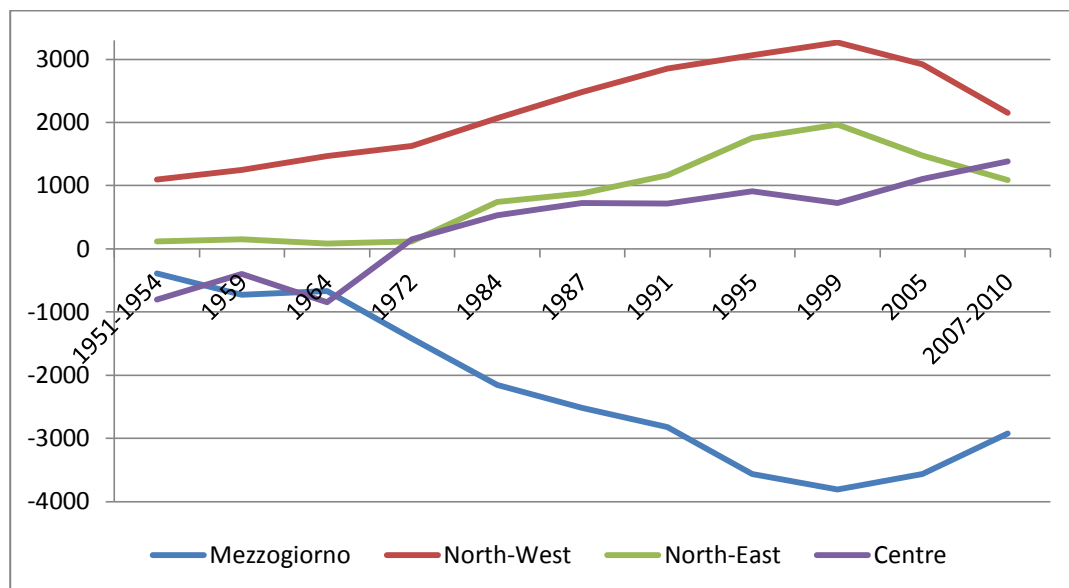
Source: Own elaboration on Tarquinio (1969), Forte *et al.* (1978), ISTAT (1996), Fondazione Agnelli (1998), Arachi *et al.* (2010), Staderini and Vadalà (2009) and Arachi *et al.* (2013).

**Figure 1b. Macro-regions' NFFs (2010 billion Euros), 1951-2010, Kernel Smoothing**



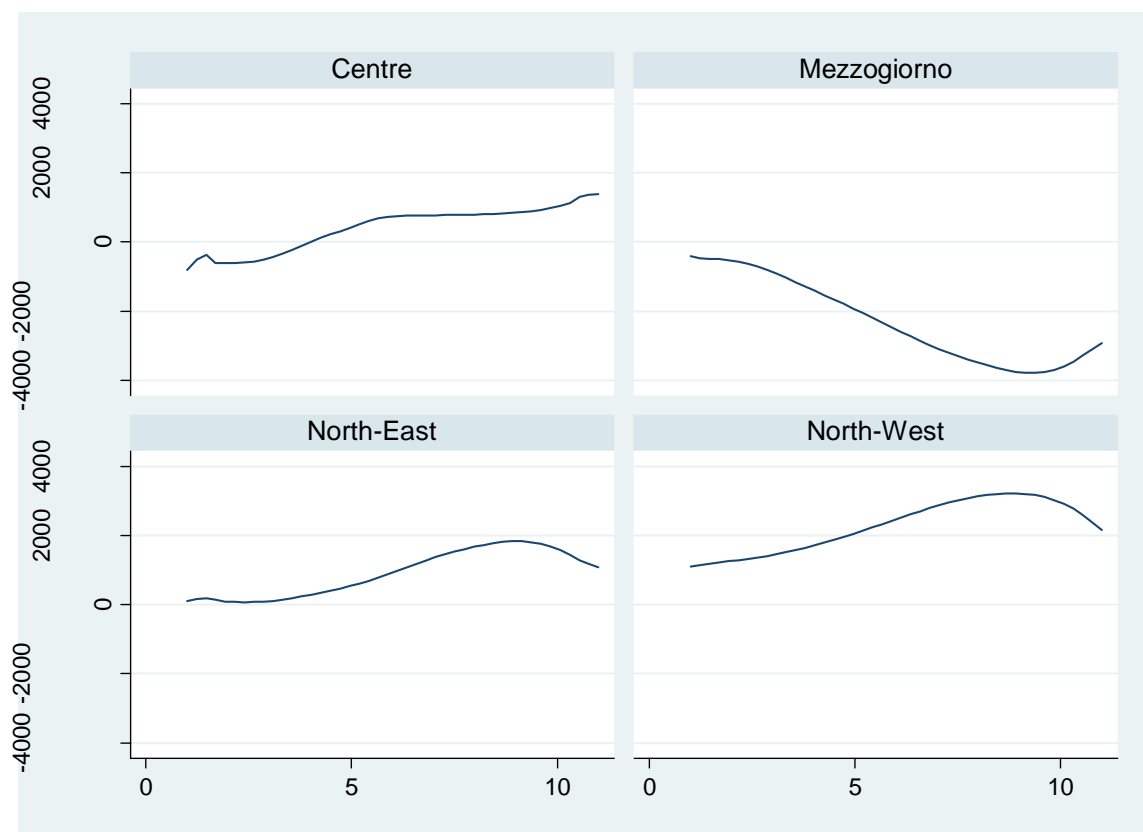
Note: Graphs are obtained by using Kernel-weighted local polinomial smoothing for each Macroregion separately.

**Figure 2a. Macro-regions' per capita NFFs (2010 Euros), 1951-2010.**



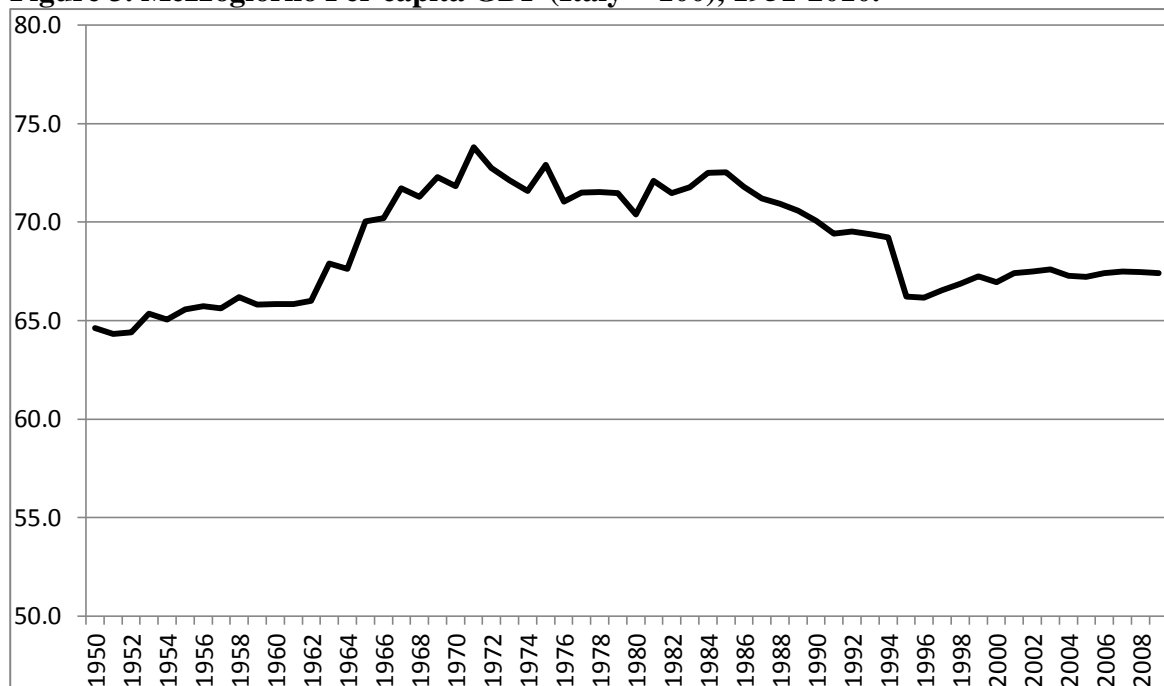
Source: Own elaboration on Tarquinio (1969), Forte *et al.* (1978), ISTAT (1996), Fondazione Agnelli (1998), Arachi *et al.* (2010), Staderini and Vadalà (2009) and Arachi *et al.* (2013).

**Figure 2b. Macro-regions' per capita NFFs (2010 Euros), 1951-2010, Kernel Smoothing**



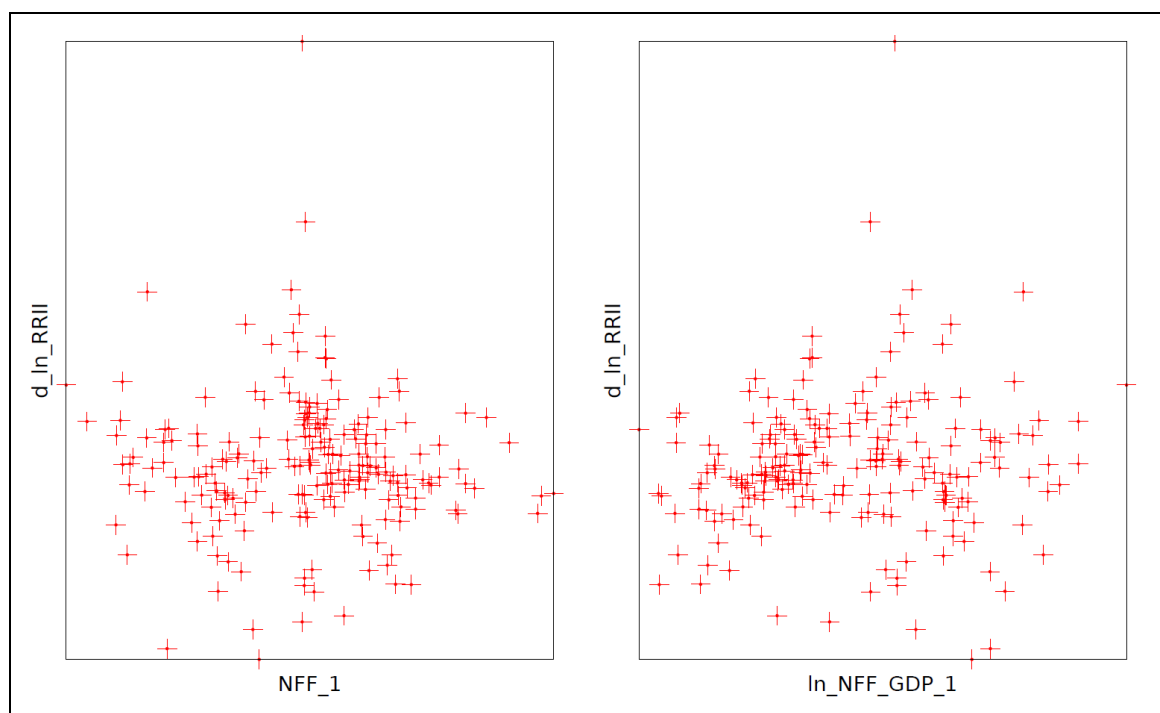
Note: Graphs are obtained by using Kernel-weighted local polynomial smoothing for each Macro-region separately.

**Figure 3. Mezzogiorno Per capita GDP (Italy = 100), 1951-2010.**



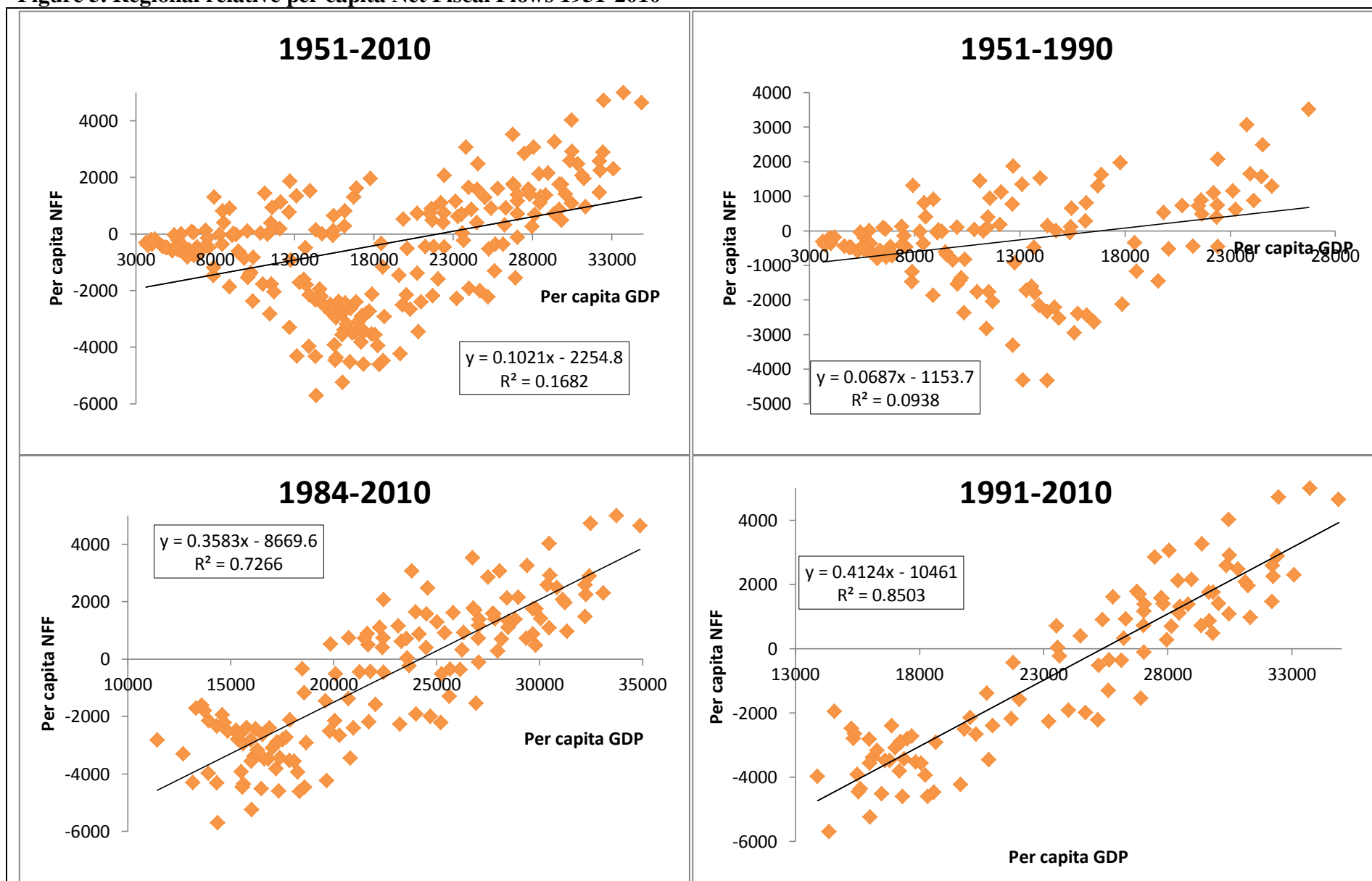
Source: Own elaboration on Vecchi (2011)

**Figure 4. NFFs and the North-South gap. Scatter plots.**



Note:  $d\_ln\_RRII$  = % change in  $RRII$ ;  $NFF\_1$  = one year lagged values of  $NFF$ ;  $ln\_NFF\_GDP\_1$  = one year lagged values of  $NFF$  to  $GDP$  ratio.

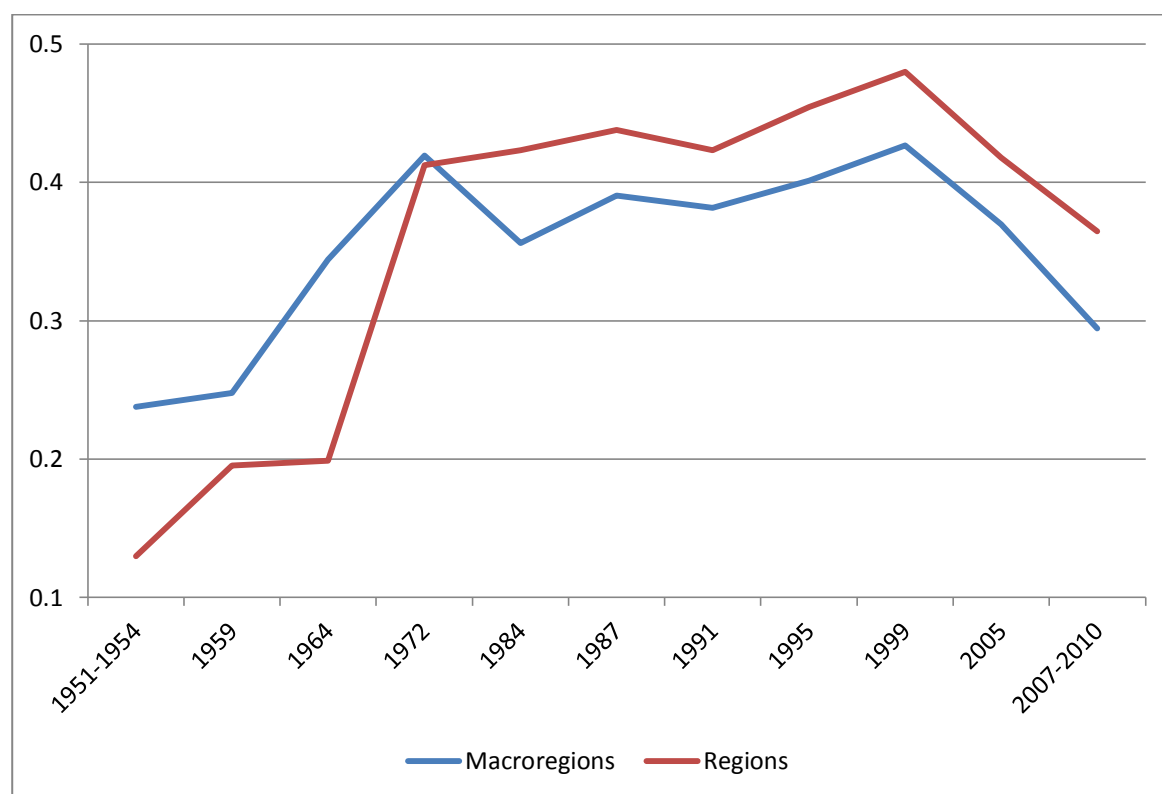
**Figure 5. Regional relative per capita Net Fiscal Flows 1951-2010**



Source: Own elaboration on Tarquinio (1969), Forte *et al.* (1978), ISTAT (1996), Fondazione Agnelli (1998), Arachi *et al.* (2010), Staderini and Vadalà (2009) and Arachi *et al.* (2013).

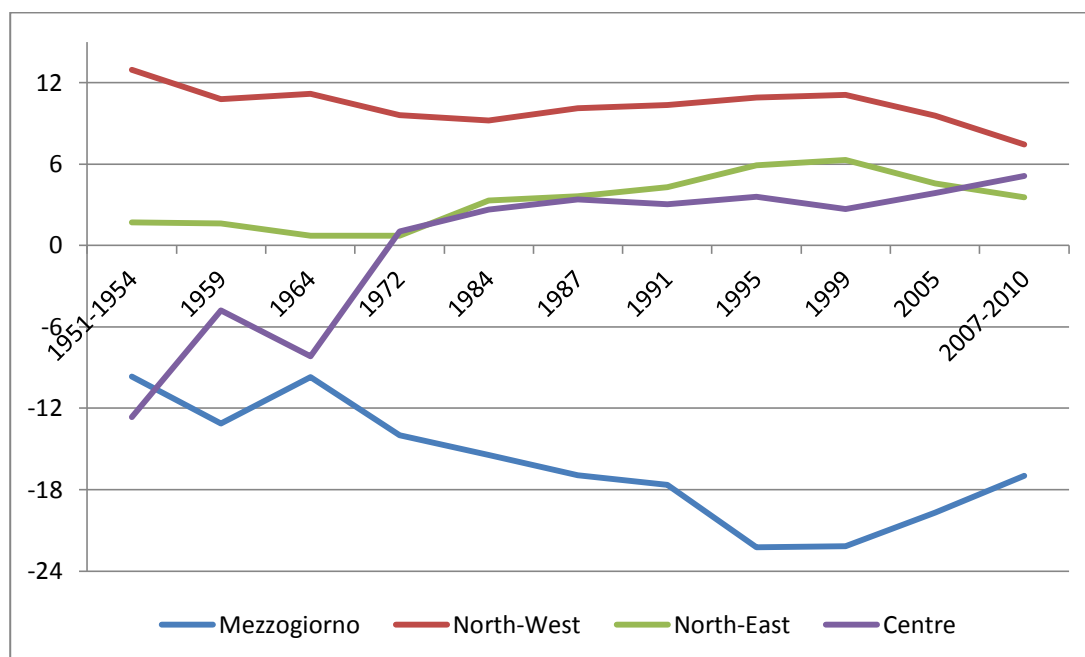
Note:  $y$  = per capita NFFs;  $x$  = per capita GDP.

**Figure 6. The Pechman and Okner index of redistribution, 1951-2010.**



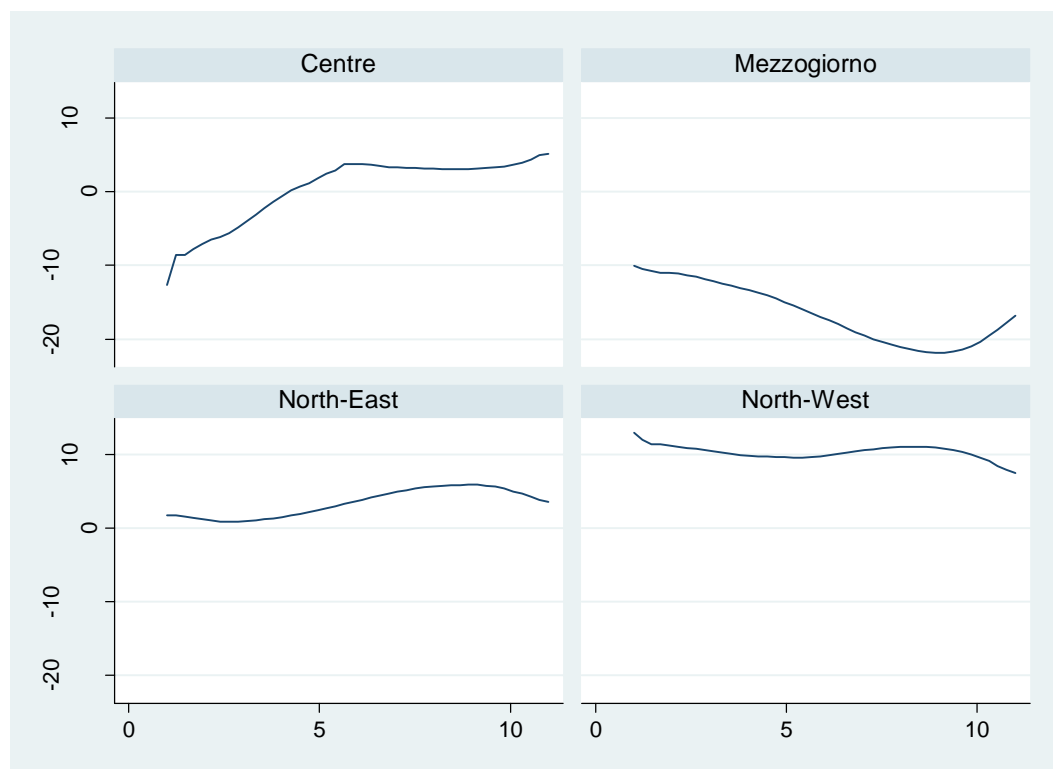
Source: Own elaboration on Tarquinio (1969), Forte *et al.* (1978), ISTAT (1996), Fondazione Agnelli (1998), Arachi *et al.* (2010), Staderini and Vadalà (2009) and Arachi *et al.* (2013).

**Figure 7a. Macro-regions' ratios NFF/GDP (%), 1951-2010.**



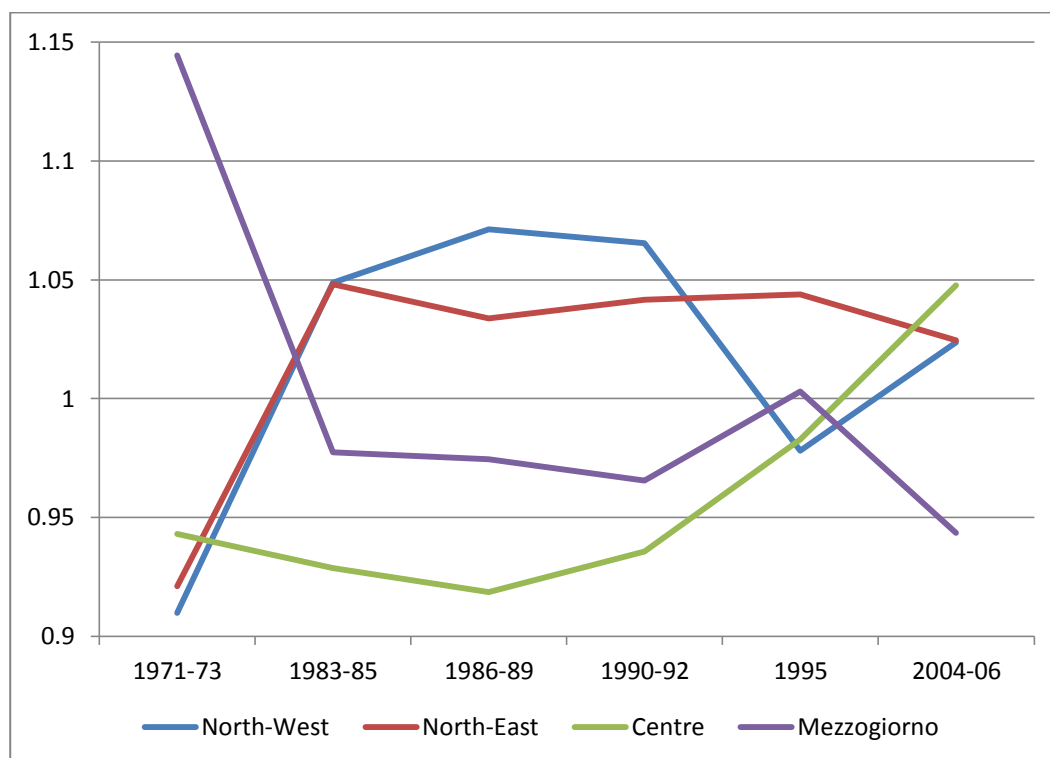
Source: Own elaboration on Tarquinio (1969), Forte *et al.* (1978), ISTAT (1996), Fondazione Agnelli (1998), Arachi *et al.* (2010), Staderini and Vadalà (2009) and Arachi *et al.* (2013).

**Figure 7b. Macro-regions' ratios NFF/GDP (%), 1951-2010, Kernel Smoothing**



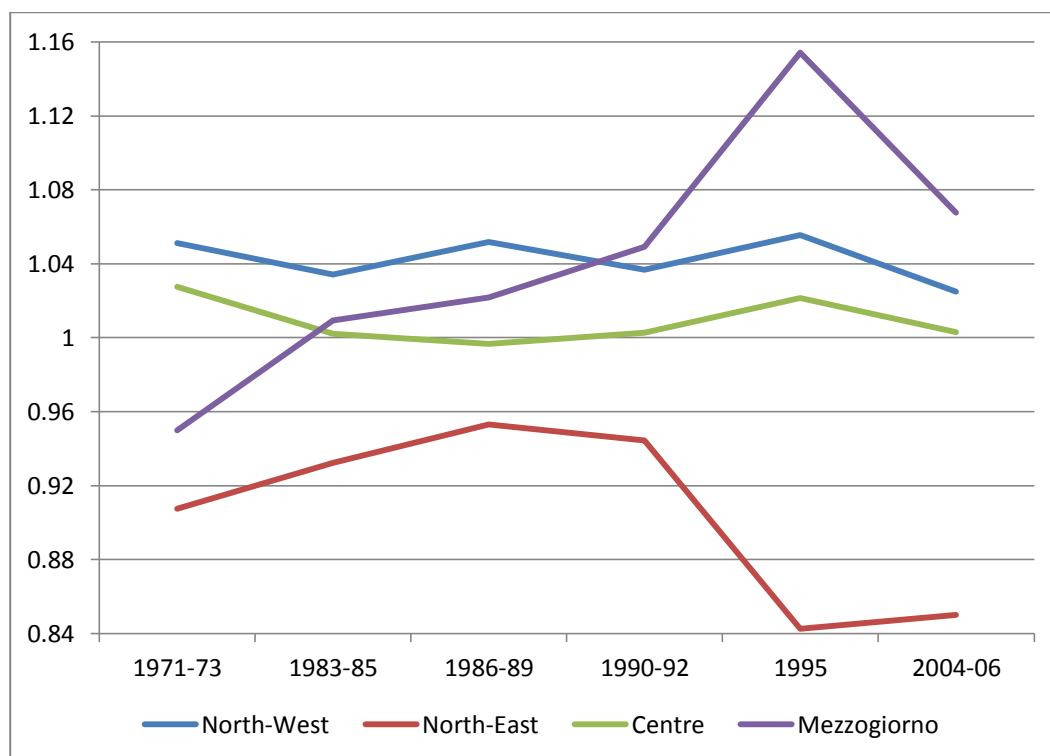
Note: Graphs are obtained by using Kernel-weighted local polynomial smoothing for each Macro-region separately.

**Figure 8. Macro-regions' per capita public expenditures, 1971-2006 (Italy = 1).**



Source: Own elaboration on Tarquinio (1969), Forte *et al.* (1978), ISTAT (1996), Fondazione Agnelli (1998), Arachi *et al.* (2010), Staderini and Vadalà (2009) and Arachi *et al.* (2013).

**Figure 9. Macro-regions' actual/normal per capita revenues, 1971-2006 (Italy = 1).**



Source: Own elaboration on Tarquinio (1969), Forte *et al.* (1978), ISTAT (1996), Fondazione Agnelli (1998), Arachi *et al.* (2010), Staderini and Vadalà (2009) and Arachi *et al.* (2013).



## **DATA APPENDIX**

**Table A1. Regional public revenues, expenditures and net fiscal flows in Italy, 1951-1965, yearly averages, per capita values in 2010 Euros.**

Regions	1951-1957			1958-1961			1962-1965		
	Revenues	Expenditures	NFFs	Revenues	Expenditures	NFFs	Revenues	Expenditures	NFFs
Piedmont	1297	1407	-110	1861	2001	-140	2528	2150	379
Aosta Valley	591	3000	-2410	641	3633	-2993	909	2763	-1853
Lombardy	1599	1236	363	2176	1767	408	2784	1752	1033
Trentino A. A.	706	1788	-1082	852	2029	-1177	1121	2138	-1017
Veneto	982	1597	-615	1307	2010	-703	1473	2049	-576
Friuli V. G.	331	1078	-747	913	1888	-974	1695	2110	-415
Liguria	2605	2264	341	3199	2763	436	3810	2881	929
Emilia Romagna	867	1741	-874	1200	2107	-907	1521	2043	-522
Tuscany	877	1710	-833	1140	2236	-1096	1416	2091	-675
Umbria	260	1178	-918	330	1554	-1225	435	1767	-1332
Marche	499	1682	-1183	685	1769	-1084	980	1662	-681
Lazio	2325	5160	-2835	3555	5379	-1824	3843	6283	-2439
Abruzzi-Molise	281	1614	-1333	363	2157	-1793	479	1759	-1280
Campania	615	1690	-1075	784	2149	-1364	1006	2023	-1017
Apulia	435	1450	-1015	508	1782	-1274	656	1717	-1061
Basilicata	115	2091	-1976	145	2825	-2681	187	2254	-2067
Calabria	186	1200	-1013	258	2192	-1934	312	2025	-1712
Sicily	231	1586	-1355	305	2156	-1850	377	1718	-1340
Sardinia	257	2477	-2220	322	3214	-2892	409	2497	-2087

*Source:* Own elaboration on Tarquinio (1969).

*Notes:* Original data (in current Liras values) were first transformed in current euro values and then converted in constant 2010 Euros using a national-wide GDP deflator. Regional revenues are constituted by cash inflows to Provincial Treasuries of the Ministry of Economy and Finance, i.e. taxes on personal income, business activities, production, consumption and customs; revenues from lotteries and public monopolies. Expenditures are calculated as the regional sum of the payments made by Provincial Treasuries of the Ministry of Economy and Finance. Data are also adjusted to take into account the payments settled by the Central Treasury of the Ministry of Economy and Finance and capital expenditures (for details, see the main text).

**Table A2. Regional public revenues, expenditures and net fiscal flows in Italy, 1971-1973, yearly averages, per capita values in 2010 Euros.**

Regions	Revenues			Expenditures				NFFs	
	Tax revenues (1)	Social security Contributions	Total (2)	Social Security payments	Exp. for collective goods (3)	Capital Exp. (4)	Total (5)	Total (2) – (5)	Net of Social Security (1) – (3) – (4)
Piedmont	2898	2064	4962	2286	828	549	3658	1303	1521
Aosta Valley	2748	2052	4800	2230	1235	1452	4918	-118	61
Lombardy	3109	2208	5317	2099	733	548	3381	1935	1828
TrentinoAlto Adige	2086	1512	3598	1609	1481	523	3614	-16	82
Veneto	2008	1399	3407	1800	983	487	3270	137	538
FriuliVenezia Giulia	2234	1703	3937	2321	1695	505	4520	-583	34
Liguria	3010	1980	4990	2443	1227	540	4211	779	1243
Emilia Romagna	2450	1614	4064	2294	946	577	3817	247	927
Tuscany	2340	1471	3811	2214	1140	539	3893	-82	661
Umbria	1867	1268	3136	2320	1068	703	4091	-955	96
Marche	1851	1131	2982	1825	1057	612	3495	-512	182
Lazio	3027	1652	4679	1809	1645	608	4062	617	774
Abruzzo	1438	816	2254	1736	1090	1129	3954	-1700	-781
Molise	1135	668	1803	1860	1162	936	3959	-2156	-963
Campania	1408	926	2334	1585	963	667	3215	-881	-222
Apulia	1311	944	2256	1649	1171	1001	3822	-1566	-861
Basilicata	1189	773	1962	1692	1065	1607	4364	-2402	-1483
Calabria	1003	750	1754	1543	1216	890	3649	-1895	-1103
Sicily	1390	986	2375	1642	1066	1060	3770	-1394	-736
Sardinia	1475	933	2408	1617	1520	1347	4482	-2074	-1392

Source: Own elaboration on Forte *et al.* (1978).

Notes: Original data (in current Liras values) were first transformed in current euro values and then converted in constant 2010 Euros using a national-wide GDP deflator.

**Table A3. Regional public revenues, expenditures and net fiscal flows in Italy, 1983-1985, yearly averages, per capita values in 2010 Euros.**

Regions	Revenues			Expenditures				NFFs	
	Tax revenues (1)	Social security contributions	Total (2)	Social security payments	Current Exp. (3)	Capital Exp. (4)	Total (5)	Total (2) – (5)	Net of Social security (1) – (3) – (4)
Piedmont	5354	3504	8857	4420	3229	775	8424	434	1350
Aosta Valley	6106	3287	9393	4780	4362	3936	13078	-3685	-2192
Lombardy	6191	3857	10048	3807	3196	751	7754	2294	2244
TrentinoAlto Adige	5114	3253	8367	3808	4193	2952	10953	-2586	-2031
Veneto	4806	3103	7909	3286	3393	801	7480	429	612
FriuliVenezia Giulia	5126	3449	8575	4448	3916	1374	9739	-1163	-164
Liguria	5344	3216	8561	4781	3887	1110	9779	-1218	347
Emilia Romagna	5655	3437	9092	4107	3651	952	8710	382	1052
Tuscany	5254	3253	8507	4140	3596	805	8542	-35	853
Umbria	4016	2892	6907	4014	3752	1086	8852	-1944	-822
Marche	4301	2972	7273	3680	3707	995	8381	-1108	-401
Lazio	5407	3350	8756	3760	3366	1508	8634	122	533
Abruzzo	3576	1603	5178	3385	3474	1537	8397	-3218	-1435
Molise	2824	1888	4712	3281	3498	2017	8796	-4083	-2691
Campania	2946	1902	4847	2935	3217	1258	7410	-2563	-1529
Apulia	2847	1875	4722	3007	3220	871	7099	-2377	-1244
Basilicata	2651	1768	4419	3167	3574	2755	9496	-5077	-3678
Calabria	2496	1552	4047	2940	3415	1285	7640	-3592	-2204
Sicily	2863	1718	4581	3134	3251	1179	7564	-2983	-1567
Sardinia	3126	2005	5131	3245	3556	1484	8286	-3154	-1914

Source: Own elaboration on ISTAT (1996).

Notes: Original data (in current Liras values) were first transformed in current euro values and then converted in constant 2010 Euros using a national-wide GDP deflator.

**Table A4. Regional public revenues, expenditures and net fiscal flows in Italy, 1986-1989, yearly averages, per capita values in 2010 Euros.**

Regions	Revenues			Expenditures				NFFs	
	Tax revenues (1)	Social security Contributions	Total (2)	Social Security Payments	Current Exp. (3)	Capital Exp. (4)	Total (5)	Total (2) – (5)	Net of Social security (1) – (3) – (4)
Piedmont	6142	3738	9880	4405	3470	816	8691	1189	1856
Aosta Valley	7278	3580	10857	5305	5060	4130	14496	-3638	-1912
Lombardy	7155	4120	11276	4107	3407	748	8262	3014	3000
TrentinoAlto Adige	5816	3475	9291	3957	4525	2396	10878	-1586	-1105
Veneto	5492	3347	8839	3563	3630	870	8063	776	992
FriuliVenezia Giulia	5677	3643	9320	4731	4179	1460	10370	-1050	38
Liguria	5777	3426	9203	5210	4037	920	10168	-965	820
Emilia Romagna	6389	3634	10023	4505	3854	880	9239	785	1655
Tuscany	5622	3344	8966	4460	3810	801	9072	-106	1011
Umbria	4552	3001	7553	4412	4049	1053	9514	-1961	-550
Marche	4813	3113	7926	4000	3981	967	8950	-1023	-135
Lazio	6074	3673	9747	3904	3514	1192	8611	1137	1368
Abruzzo	4014	2308	6323	3709	3633	1325	8668	-2345	-944
Molise	3235	2100	5335	3407	3770	1862	9039	-3704	-2397
Campania	3172	1965	5137	3085	3476	1419	7980	-2843	-1723
Apulia	3159	1980	5139	3240	3396	727	7364	-2225	-964
Basilicata	2880	1929	4809	3305	3855	2476	9636	-4826	-3451
Calabria	2683	1662	4345	3143	3626	1383	8151	-3807	-2326
Sicily	3141	1833	4975	3513	3624	1297	8433	-3459	-1780
Sardinia	3499	2179	5678	3402	3856	1361	8619	-2941	-1718

Source: Own elaboration on ISTAT (1996).

Notes: Original data (in current Liras values) were first transformed in current euro values and then converted in constant 2010 Euros using a national-wide GDP deflator.

**Table A5. Regional public revenues, expenditures and net fiscal flows in Italy, 1990-1992, yearly averages, per capita values in 2010 Euros.**

Regions	Revenues			Expenditures				NFFs	
	Tax revenues (1)	Social security Contributions	Total (2)	Social Security Payments	CurrentExp. (3)	Capital Exp. (4)	Total (5)	Total (2) – (5)	Net of Social security (1) – (3) – (4)
Piedmont	7057	4283	11341	4955	3873	864	9693	1648	2320
Aosta Valley	8607	3973	12579	5542	6218	3423	15183	-2604	-1034
Lombardy	8445	4578	13023	4683	3786	774	9243	3780	3885
TrentinoAlto Adige	6758	4047	10805	4651	5249	2758	12657	-1852	-1249
Veneto	6564	3859	10423	4110	4024	841	8975	1447	1699
FriuliVenezia Giulia	6860	4221	11081	5353	4577	1384	11313	-232	899
Liguria	6936	3836	10771	5934	4517	1082	11533	-762	1337
Emilia Romagna	7543	4124	11667	5185	4371	784	10340	1327	2388
Tuscany	6569	3771	10340	5004	4255	923	10182	158	1391
Umbria	5392	3401	8793	5003	4572	1043	10619	-1826	-223
Marche	5637	3496	9133	4542	4414	856	9812	-679	367
Lazio	7127	4188	11315	4461	3997	1488	9947	1369	1642
Abruzzo	4790	2719	7509	4247	4073	1221	9541	-2032	-504
Molise	3859	2440	6298	4021	4300	1715	10036	-3738	-2156
Campania	3719	2242	5962	3446	4008	1235	8690	-2728	-1524
Apulia	3723	2287	6010	3755	3737	707	8200	-2190	-721
Basilicata	3383	2148	5532	3687	4260	2188	10135	-4603	-3065
Calabria	3138	1866	5004	3757	4135	1327	9219	-4215	-2324
Sicily	3779	2211	5990	4097	4351	1271	9718	-3728	-1843
Sardinia	4225	2597	6822	3847	4456	1487	9791	-2969	-1718

Source: Own elaboration on ISTAT (1996).

Notes: Original data (in current Liras values) were first transformed in current euro values and then converted in constant 2010 Euros using a national-wide GDP deflator.

**Table A6. Regional public revenues, expenditures and net fiscal flows in Italy, 1995-2010, yearly averages, per capita values in 2010 Euros.**

Regions	1995			1996-2002	2004-2006			2007-2010
	Revenues	Expenditures	NFFs	NFFs	Revenues	Expenditures	NFFs	NFFs
Piedmont	11821	10915	906	2581	14187	12649	1539	1458
Aosta Valley	13031	18272	-5241	-4175	16887	20922	-4034	-708
Lombardy	13293	9410	3883	6014	16361	11196	5164	2585
Trentino A. A.	11723	15874	-4151	-776	13220	14655	-1435	-1158
Veneto	11350	9260	2090	3492	13137	10690	2446	764
Friuli V. G.	11272	13269	-1997	894	13957	13834	123	722
Liguria	11201	13957	-2756	-285	13050	14077	-1027	1703
Emilia Romagna	12676	11032	1644	3908	15122	12299	2824	2080
Tuscany	10895	10414	-519	1289	13458	12219	1239	693
Umbria	9248	11357	-3109	-980	11643	13346	-1702	34
Marche	9501	9570	-1069	661	11857	11451	406	-364
Lazio	13217	10935	1282	2768	15118	12346	2772	2586
Abruzzo	7817	10755	-2938	-957	9932	11248	-1316	-1234
Molise	6860	11767	-4907	-3037	8418	12522	-4104	-1987
Campania	5998	9632	-3634	-2368	7675	10340	-2665	-3174
Apulia	6473	9964	-3491	-2076	7692	10266	-2574	-2398
Basilicata	6326	11088	-4762	-3593	7840	12275	-4435	-2912
Calabria	5208	11752	-6544	-4228	7266	11844	-4578	-3479
Sicily	6188	11490	-5302	-3498	7902	11282	-3380	-3437
Sardinia	7044	11821	-4777	-3217	9504	12799	-3295	-2658

*Source:* Own elaboration on Fondazione Agnelli (1998) for 1995, Arachi *et al.* (2010) for 1996-2002, Staderini and Vadalà (2009) for 2004-2006 and Arachi *et al.* (2013) for 2007-2010.

*Notes:* Original data (in current Liras values) were first transformed in current Euro values and then converted in constant 2010 Euros using a national-wide GDP deflator. Since Fondazione Agnelli (1998) does not supply data on social security payments, these are supposed to be equal in per capita terms to the values of 1990-1992. Arachi *et al.* (2010) presents only data on net fiscal flows. The data in Arachi *et al.* (2013) regard only net fiscal flows as well; also, in this latter case data are adjusted so that the aggregate NFF is zero.

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