

# INTERREGIONAL NET FISCAL FLOWS IN YEARS 2007-2015. ITALY AND GERMANY AT THE MIRROR

Carmelo Petraglia<sup>a</sup> and Domenico Scalera<sup>b</sup>

<sup>a</sup> Department of Mathematics, Computer Science and Economics, University of Basilicata, viale dell'Ateneo Lucano 10, 85100 Potenza, Italy

<sup>b</sup> Department of Law and Economics – DEMM, University of Sannio, piazza Arechi II, 82100 Benevento, Italy

*Abstract:* This paper provides new evidence on the size of regional and macro-regional Net Fiscal Flows (NFFs) in Italy and Germany in years 2007-2015, and a tentative evaluation of the interregional redistributive action operated by the public sector through fiscal transfers in the two countries. Although the comparison is made difficult by the limited comparability of data, the investigation shows that on the whole NFFs have been higher and their redistributive impact stronger in Italy. However, this finding is mitigated by a number of considerations. First, the omission of social security balances, which in Germany are likely to be larger and more relevant to overall interregional redistribution, may partly alter the comparison; second, in Italy regional administrative status more significantly affects interregional transfers; third, while the burden for contributing regions increases faster in Italy as relative regional income increases, the threshold from which a region becomes a donor is significantly lower in Germany; fourth, fiscal transfers from high-income Northern to low-income Southern regions have been substantially reduced in the last years.

*Keywords:* interregional redistribution, Net fiscal flows, Italian regions, German Länder.

*J.E.L. Classification:* H50; H70; H72; R10.

## 1. Introduction

A facet of North-South disparities in Italy that has recently taken center stage in the academic and political debate concerns interregional redistribution operated through public finance (see, among others, UPB, 2017, Petraglia *et al.*, 2018; Viesti, 2019). From the end of the Second World War, in most developed countries the public sector has been given a major role in territorial rebalancing (for a survey see Martinelli, 2013). In the Italian case, characterized by a peculiarly large and long-lasting gap between the (rela-

---

Corresponding author: Carmelo Petraglia, [carmelo.petraglia@unibas.it](mailto:carmelo.petraglia@unibas.it).

Received: 26 February 2019/Revise and resubmit: 28 April 2019/Revised: 13 June 2019/Accepted: 2 July 2019.

tively) rich and poor parts of the country, this has originated large and persistent financial flows from Northern to Southern regions, and in the last couple of decades, lively criticism about a presumed excess in interregional transfers operated by the public sector<sup>1</sup> (Giannola *et al.*, 2011; 2016). The argument is basically that political interests, lobbying, bribery and inefficiencies in the provision of local public services would inflate regional fiscal imbalances of Southern regions, thus imposing an unbearable burden on contributing regions of the North. However, the fact that at least in the last couple of decades, per capita public expenditure has been systematically lower in the South, despite the constitutional principle of equal access to citizenship rights, invalidates this view, showing that corruption and maladministration may have led to less and worse public goods in Southern regions, rather than impoverished Northern regions<sup>2</sup>. Thus, most of economic literature (for example, Ferrario and Zanardi, 2011; Giannola *et al.*, 2016, 2017; UPB, 2017, Petraglia *et al.*, 2018; Vittorino, 2019), has rather emphasized that in Italy the size of interregional transfers has been jointly determined by a) an automatic redistribution due to the combination of large geographical differences in taxable incomes, a progressive taxation system, and the (imperfect) tendency to equalize per capita welfare expenditure across regions and b) discretionary policies aimed at mitigating short-run idiosyncratic regional shocks, often hitting more severely the South (risk sharing), and promoting long-run economic development in lagging regions.

In this paper, we reconsider this issue by proposing a first attempt to evaluate the consistency of regional financial balances in Italy through a comparison with deficits and surpluses of German Länder. In particular, we aim at providing a descriptive picture of the main patterns of interregional financial transfers in the two countries in years 2007-2015, their correlation with regional income, and the dynamics observed during the crisis turmoil. Although the international comparison here proposed is admittedly ham-

<sup>1</sup> In this vein, a few Northern regional administrations (Emilia Romagna, Lombardy and Veneto) have recently taken steps of retaining a part of taxes locally collected. Even if these regions justify their request by the need to finance further competencies in many public functions (education, health, security), this initiative looks actually to be aimed at drastically reducing interregional redistribution, considering the large share of tax revenues claimed by contributing regions. Currently, the possible real implications of such a reform are debated, with many scholars evaluating its consequences as possibly disruptive for the expenditure capacity of the public sector in Southern regions and the provision of fundamental public services to Southern citizens.

<sup>2</sup> The evidence of per capita public expenditure being systematically lower in the South since the late 90s is reported in Department for Development Policies (various years) and Agency for Territorial Cohesion (various years).

pered by serious limitations in data comparability, we still believe that confronting the cases of Italy and Germany supplies useful indications about the relative size of interregional redistribution, also providing some suggestions on the factors other than income affecting transfers, the recent time trends and the stance of policy makers in the two countries. Being aware of the limitations due to the computation of sub-national fiscal flows in both countries and subsequent comparability problems, we consider our results as a first evidence to be enriched in future research by a deeper analysis on computational issues<sup>3</sup>.

The choice of Germany as a touchstone may be easily justified by the geographic dualism between East and West Germany, which after the political unification in 1990 closely resembled the dichotomy between Northern and Southern regions in Italy (Hughes Hallett and Ma, 1993; Sinn and Westermann, 2001). Indeed, the dynamics of relative per capita GDP in the last 25 years have been quite different in Eastern Germany and Southern Italy. According to Boltho *et al.* (1997), in 1993 the ratios of per capita GDP with respect to the rest of the country were 0.46 and 0.60 respectively in Eastern Germany and Southern Italy. In the following years, in Italy the relative lag of the South worsened in the first half of the 1990s, and since then it has remained by and large unaltered at around 0.57. In Germany, due to the impressive process of regional income convergence occurred in the first half of the 1990s, the Eastern per capita GDP rose up to around 0.60 in 1997 to further increase to 0.68 in the two following decades, when a substantial slowdown in convergence took place (Hall and Ludwig, 2006; Boltho *et al.*, 2018; Burda and Severgnini, 2018). In general, despite the more favorable dynamics, and the present less substantial differences between East and West, the geographical divide of Germany still seems to be a relevant benchmark against which to assess the extent of interregional redistribution in Italy.

Our investigation is conducted by comparing sub-national Net Fiscal Flows (NFFs), which we compute for Italian regions and German Län-

<sup>3</sup> Many authors evaluate interregional redistribution connected to public intervention by using a comparative approach despite the serious problems of international comparisons. Among the first, MacDougall (1977) contrasts redistribution operated within several countries; Bayoumi and Masson (1995) compare Canada and United States; Castells (1998) evaluates redistribution in some European countries; Méritz and Zumer (1998) in France, United Kingdom, Canada and United States; Obstfeld and Peri (1998) in Italy, United States and Canada. More recent contributions are the ones by Bosch *et al.* (2002) on Australia, Spain and United States; Decressin (2002) on Italy, France, United Kingdom, Canada, and United States; Rodden (2010) on Argentina, Australia, Brazil, Canada, European Union, Germany, India, Spain and United States; Bosch and Espasa (2017) on Australia, Belgium, Canada, Italy, Spain and United States.

der for years between 2007 and 2015. The indicator NFF is defined as the difference between what the residents of a region contribute to the general (central, local and possibly social security) government and what they gain from it in terms of public spending targeted to that region<sup>4</sup>. Computation of NFFs for Italian regions is made possible by the availability of a detailed dataset from the Regional Public Accounts (*Sistema dei Conti Pubblici Territoriali*) supplied by the Agency for Territorial Cohesion (*Agenzia per la Coesione Territoriale*). For Germany, the main sources of data for NFFs are the Federal Ministry of Finance (*Bundesministerium der Finanzen*) and the Federal Statistical Office (*Statistisches Bundesamt*).

Since in Germany complete data for social security revenues and outlays are not available for Länder, we consider for both countries NFFs net of social security, so as to mitigate the problem of data comparability. Nonetheless we are aware that the exclusion of social security makes NFFs less representative of redistribution operated through public finance since the redistributive weight of social security is likely to be higher in Germany than Italy<sup>5</sup>.

After calculating regional and macro-regional NFFs in the two countries in absolute and per capita terms, and as ratios to GDP, we undertake a tentative assessment of interregional redistribution for Italy and Germany, and find that moderate redistribution took place in both countries throughout the period 2007-2015, with differences in intensity, time dynamics, and the weight of relevant factors (regional income, size and administrative status of regions and Länder)<sup>6</sup>. As recalled above, and outlined in the literature (Boadway and Shah, 2007), NFFs may be at the same time an effect of interregional income differences and an instrument through which the policy

<sup>4</sup> In the literature NFF is also named fiscal residuum, fiscal balance, net fiscal transfer, etc. Sometimes it is alternatively measured as public expenditure minus taxation (the opposite of our definition). In federal contexts, NFF is often calculated as the difference between the payments made by residents and regional government to other (federal or regional) governments, and direct spending and intergovernmental transfers in favor of that region (Ruggeri, 2010). Bird and Tarasov (2004) distinguish between vertical and horizontal fiscal imbalances; Arachi *et al.* (2010) and De Simone and Liberati (2019) split regional NFFs into their vertical and horizontal components.

<sup>5</sup> On this point, see the discussion at the end of Section 3.1.

<sup>6</sup> The administrative status of Italian regions is either ordinary or special. The latter is recognized to islands (Sardinia and Sicily) and Northern border regions with relatively large linguistic minorities (i.e., Aosta Valley, Trentino Alto Adige and Friuli Venezia Giulia). The special administrative status entitles these regions to enjoy broader spending powers and retain a larger share of their own fiscal revenues. In Germany, Länder are either Area States (*Flächenländer*) or City States (*Stadtstaaten*). The latter (Berlin, Bremen and Hamburg) enjoy a few fiscal advantages such as a larger weight of population in calculating the Equalization Index used for determining the fiscal needs of each Land.

maker may influence those differences. This requires to be cautious in the causal interpretation of the results we provide, and to look at the links between public financial transfers and regional income merely in terms of correlation more than as the effect of policies aiming at territorial rebalancing.

Following this introduction, Section 2 presents our dataset, from which we derive NFFs of regions and Länder for Italy and Germany. Section 3.1 deals with the comparison of NNFs for macro-regions, i.e. homogeneous groups of regions in Italy and Länder in Germany. Section 3.2 focuses on the regional detail, comparing intensity and time trend of transfers in the two countries and Section 3.3 presents a simple econometric exercise meant to evaluate the redistributive content of NFFs. Section 4 collects the main conclusions of the paper.

## 2. *Data*

The data employed in this investigation cover the period 2007-2015, the most recent years for which official figures on public revenue and expenditure at the sub-national level for both Germany and Italy are available. As far as we know, this is the first attempt to carry out a systematic comparison of interregional financial flows in Italy and Germany, a comparison made difficult by serious limitations in data comparability, mainly due to differences in the fiscal institutional framework of the two countries. Therefore, being aware of possible drawbacks, we consider our analysis as an explorative study conducted with the limited aim of providing first evidence in this field, to be enriched in the future by more information and more precise screening of the items included and excluded in the calculation of regional NFFs and the methods employed to regionalize national figures in both countries.

As we discuss below in more detail, in order to reduce further bias induced by data handling, we mostly base our analysis on primary data which official sources directly supply at the sub-national level. Only when disaggregated official primary data are not available, we derive regional figures from national revenues and expenditures under some explicit hypotheses. Our primary official sources of regionalized revenues and expenditures are the Regional Public Accounts (RPA) supplied by the Agency for Territorial Cohesion<sup>7</sup> for Italy and Federal Ministry of Finance and Federal Statistical Office for Germany. The sources we tap into for regional data on population, and gross domestic product are ISTAT (*Istituto Nazionale di Statistica*) for Italy

<sup>7</sup> For details see [http://old2018.agenziacoesione.gov.it/it/cpt/07\\_english\\_version/index.html](http://old2018.agenziacoesione.gov.it/it/cpt/07_english_version/index.html).

and State Statistical Office of Baden-Württemberg (*Statistisches Landesamt Baden-Württemberg*) for Germany.

The RPA dataset has been extensively used in a number of studies aiming at estimating the size of interregional redistribution and risk-sharing in Italy (see, among others, Arachi *et al.*, 2010; Petraglia *et al.*, 2018). The Italian public administration includes three levels of government: the central government, administrative regions (21 units including the autonomous provinces of Trento and Bolzano), and local governments (110 provinces and more than 8,000 municipalities), plus the nationwide social security system (pensions and unemployment insurance). The RPA dataset provides a breakdown of annual revenue and expenditure flows by each level of government; also, and more importantly for our aims, it includes regional consolidated public economic accounts (net of transfers among different tiers of government), on which our analysis is based.

The methodological guide to the RPA dataset by Volpe *et al.* (2007) discusses the methods employed to regionalize public revenues and expenditures. For public revenues, regionalization is made according to the geographical distribution of the sources of revenue. Instead, public expenditures are regionalized according to the place where public production is located. As a consequence, to assign expenditures to regions on the basis of benefits enjoyed by residents, an adjustment is needed. Following Volpe *et al.* (2007), we allot central government expenditure for collective services (general administration, national defense and public order) on the basis of resident population<sup>8</sup>. This allows to correct or attenuate the bias induced by the concentration of Central Public Administrations in the capital region Latium where the capital city (Rome) is located<sup>9</sup>.

The fiscal framework of Germany comprises sixteen Länder, i.e. thirteen federal states (*Flächenländer*) and the three city-states (*Stadtstaaten*) of Berlin, Bremen and Hamburg. The tax autonomy of Länder is relatively limited and decisions on expenditure are largely taken at the federal level. Also, the Basic Law requires that all Länder must dispose of adequate financial means to ensure equivalent living standards. This constitutional principle is guaranteed

<sup>8</sup> Some other possible minor distortions arise for both revenues and expenditures due to consumption taxes (which should be assigned to the region of consumers rather than sellers to the extent that tax shift occurs) and healthcare mobility (for which residents of a region temporarily migrate to other regions for medical treatments). For the sake of simplicity and lack of data, we do not consider further adjustments.

<sup>9</sup> Computations and regressions of Section 3 are made on adjusted data. For robustness sake, we also repeated the analysis on the original dataset obtaining significant differences for the NFF of Latium but overall results basically unaltered.



by the implementation of an extensive system of revenue sharing and equalization (Buettner, 2006; Baskaran *et al.*, 2017).

Public expenditure and revenue data used for the computation of NFFs in Germany are retrieved from Federal Ministry of Finance (2017), providing an overview of budget figures for three levels of government (the Federation, the sixteen Länder and local authorities) for the most recent years for which actual figures are available. Federal Ministry of Finance (2017) does not supply consolidated fiscal data at the Land level directly comparable to Italian regional data retrieved from RPA. For this reason, in what follows NFFs are computed by elaborating on figures available at the Land and federation levels to construct reliable estimations of both regional revenues and expenditures. As for revenues, we add to each Land's own fiscal revenues a share of federal fiscal revenues proportional to the respective share of federal total GDP. In a similar way, on the expenditure side, the total Land's expenditure is augmented by a share of federal expenditure proportional to the residing population. Finally, grants received and contributions paid by each Land connected to the implementation of the Länder Financial Equalization System are included in the computation of NFFs, as well as supplementary federal grants for special needs<sup>10</sup>.

The notion of NFF we adopt, i.e. the difference between total revenues raised from a given territory (Italian region/German Land) and public non-interest expenditure targeted to that territory, is meant to be as comprehensive as possible, and to include all public revenues and (current and capital) expenditures relevant to a given region, in accordance with the aim to represent the whole difference between what the residents of a region contribute to government and what they gain from it in terms of public spending targeted to that region. However, as already mentioned in Section 1, regional NFFs of both countries do not include social security financial flows due to the lack of regional data for Germany. In addition, NFFs leave out interest payments on public debt, given the difficulty to evaluate this item at a sub-

<sup>10</sup> In detail, data on total Länder revenue and expenditure (including local authorities) are retrieved from Federal Ministry of Finance (2017, chapter 4, pp. 24-39). Data on grants and contributions relative to the Länder Financial Equalization System (Article 107, paragraph 2, second sentence of the Basic Law in conjunction with Section 4, 5 and 10 of the Financial Equalisation Act) are retrieved from Federal Ministry of Finance (2017, chapter 5, p. 51). Finally, data on supplementary federal grants for special needs (Article 107, paragraph 2, third sentence of the Basic Law in conjunction with Section 11 of the Financial Equalisation Act) for former German Democratic Republic Länder and Berlin, and smaller Länder with below average financial capacity, are taken from Federal Ministry of Finance (2017, chapter 5, pp. 53-54).

national level<sup>11</sup>, and for the same reason, revenues and expenditures of public enterprises located in different regions and Länder.

Summarizing, to compute NFFs, we calculate

$$(1) \quad NFF_{it} = T_{it} - G_{it}$$

where  $i$  are regions for Italy and Länder for Germany, and  $t = 2007, \dots, 2015$  are years.  $T$  and  $G$  are respectively total fiscal revenues and total public non-interest expenditure targeted to the region or the land. Under this definition, a negative value for  $NFF_i$  means that in region  $i$  expenditures exceed revenues, so that local residents receive net resources from the rest of the country. On the other hand, a positive value for  $NFF_i$  means that tax payers resident in region  $i$  transfer part of their resources to finance expenditures in other regions.

NFFs computed using (1) are finally adjusted to account for aggregate public surplus or deficit. In fact, if the purpose of reckoning regional NFFs is that of constructing a measure of the intensity of regional redistribution operated through the public sector, it is sensible to cleanse regional balances from the amount accounting for the regional share of the overall surplus or deficit. To do that, we amend NFFs by allocating surplus or deficit to regions and Länder on a per capita basis, so as to have a zero aggregate NFF (i.e. zero national aggregate NFF and therefore zero national per capita NFF). This is in line with a large part of the literature (Mansell and Schlenker, 1995; Ambrosanio *et al.*, 2010; Giannola *et al.*, 2016) and most needed in our case to increase comparability between the two economies.

### 3. Comparing NFFs in Italy and Germany

The following investigation is conducted at both the level of macro-regions, i.e. homogeneous aggregates of regions or Länder (Section 3.1), and individual regions in Italy and Länder in Germany (Sections 3.2 and 3.3). The first two sections are devoted to a descriptive analysis of fiscal unbal-

<sup>11</sup> Considering the payment of interests on public debt would probably involve a reduction in the absolute value of regional NFFs in Italy (Giannola and Scalera, 1995; Giannola *et al.*, 2017; Giannola and Stornaiuolo, 2018). On the other hand, it could imply further difficulties in data comparability, considering that the share of total public debt issued by Länder in Germany and regions in Italy is considerably different. For Germany, to subtract interest payments on federation debt from gross NFFs, we resort to data from Deutsche Bundesbank.



ances, while the third one carries out a first tentative comparative study on the intensity of interregional redistribution operated through fiscal flows.

### 3.1. *Macro-region NFFs*

The comparative analysis of interregional fiscal flows operated by the public sector in Italy and Germany between 2007 and 2015 may start from inspection of Tables 1 and 2 reporting the values of NFFs (computed as explained above) for respectively Italian and German macro-regions<sup>12</sup>. For the sake of clarity, data are presented by annual averages over triennia 2007-2009, 2010-2012 and 2013-15. Each table is split into three panels: the first one reports NFFs in million Euros and the second one in per capita Euros (both are in 2010 constant prices), while in the third panel NFFs are reported as shares to regional GDP.

The first remark concerns the size of interregional transfers occurring throughout the whole period from Northern to Southern regions in Italy and from Western to Eastern regions in Germany. Consistent with previous literature, North-West comes out to be the main contributing macro-region in Italy. In fact, this area shows yearly NFFs between 32.4 and 41.6 billion Euros, whereas South and Islands together absorb every year between 57.1 and 65.3 billion Euros. In per capita terms, the contribution of North-West is again the most significant; North-East and Centre NFFs are noteworthy as well, but much lower (on average between 1,091 and 1,445 Euros per year in North-East and between 888 and 1,026 Euros per year versus between 2,037 and 2,690 paid by each North-Western resident), whereas in South and Islands the annual per capita benefit is quantified between 2,501 and 3,441 Euros. When considered as shares of local GDP, substantial positive NFFs emerge for the North (between 3.4% and 7.9% of local GDP in different

<sup>12</sup> The macro-regions considered in this study are: for Italy, North-West, North-East, Centre, South and Islands; for Germany, Western Large States, Western Small States, Western City States, Berlin City State and Eastern States.

Macro-regions are made up by the following groups of regions or *Länder*. For Italy: North-West includes Piedmont, Aosta Valley, Lombardy and Liguria; North-East includes Veneto, Friuli, Trento, Bolzano and Emilia Romagna; Centre includes Tuscany, Umbria, Marche and Latium; South includes Campania, Apulia, Basilicata, Abruzzo, Calabria and Molise; Islands are Sicily and Sardinia. For Germany: Western Large States include Bayern, Baden-Württemberg, Hessen, Niedersachsen, Nordrhein-Westfalen; Western Small States include Rheinland-Pfalz, Saarland and Schleswig-Holstein; Western City States are Bremen and Hamburg; Eastern States include Brandenburg, Mecklenburg-Vorpommern, Sachsen, Sachsen-Anhalt and Thüringen.

TAB. 1. *NFFs in Italy by macro-region (2007-2015, annual averages)*

	2007-2009	2010-2012	2013-2015
(a) million Euros (2010 constant prices)			
North-West	41,640	32,448	32,701
North-East	12,243	16,498	13,860
Centre	11,508	11,865	10,569
South	-42,612	-38,250	-35,256
Islands	-22,780	-22,560	-21,874
(b) per capita Euros (2010 constant prices)			
North-West	2,690	2,065	2,037
North-East	1,091	1,445	1,194
Centre	1,014	1,026	888
South	-3,054	-2,736	-2,501
Islands	-3,441	-3,397	-3,257
(c) % GDP			
North-West	7.9	6.2	6.5
North-East	3.4	4.6	3.9
Centre	3.2	3.4	3.1
South	-16.1	-15.3	-14.7
Islands	-17.9	-18.8	-19.2

*Notes:* North-West includes Piedmont, Aosta Valley, Lombardy and Liguria; North-East includes Veneto, Friuli, Trento, Bolzano and Emilia Romagna; Centre includes Tuscany, Umbria, Marche and Latium; South includes Campania, Apulia, Basilicata, Abruzzo, Calabria and Molise; Islands include Sicily and Sardinia.

*Source:* Own elaboration on Regional Public Accounts and ISTAT.

TAB. 2. *NFFs in Germany by macro-region (2007-2015, annual averages)*

	2007-2009	2010-2012	2013-2015
(a) million Euros (2010 constant prices)			
Western Large States	23,851	23,635	23,076
Western Small States	-4,359	-5,027	-4,219
Western City States	4,973	3,948	4,397
Berlin City State	-3,032	-4,306	-4,418
Eastern States	-21,433	-18,251	-18,836
(b) per capita Euros (2010 constant prices)			
Western Large States	432	433	421
Western Small States	-551	-643	-540
Western City States	2,046	1,653	1,822
Berlin City State	-884	-1,280	-1,284
Eastern States	-1,637	-1,442	-1,507
(c) % GDP			
Western Large States	1.3	1.2	1.0
Western Small States	-2.0	-2.1	-1.6
Western City States	4.1	3.1	3.1
Berlin City State	-3.1	-3.9	-3.5
Eastern States	-7.8	-6.1	-5.5

*Notes:* Western Large States include Bayern, Baden-Württemberg, Hessen, Niedersachsen, Nordrhein-Westfalen; Western Small States include Rheinland-Pfalz, Saarland and Schleswig-Holstein; Western City States include Bremen and Hamburg; Eastern States include Brandenburg, Mecklenburg-Vorpommern, Sachsen, Sachsen-Anhalt and Thüringen.

*Source:* Own elaboration on Federal Ministry of Finance, Statistisches Landesamt Baden-Württemberg and Deutsche Bundesbank.

areas and times) and large negative NFFs for South (14.7%-16.1%) and Islands (17.9%-19.2%). Central Italy steadily contributes by about 3% of its GDP.

In Germany, the largest contributing macro-regions are those of Western City States (between 1,653 and 2,046 Euros in per capita terms for each year in the considered period) and Western Large States (between 23.1 and 23.9 billion Euros in absolute terms). Conversely, the City State of Berlin and Eastern States are the macro-regions receiving the highest gains from fiscal transfers, respectively in terms of per capita (between 884 and 1,284 Euros per year for Berlin) and absolute terms (between 18.3 and 21.4 billion Euros per year for Eastern States). Looking at NFFs as shares of local GDP, on the one hand Western City States show figures between 3.1% and 4.1%, somehow comparable to those of North-Eastern Italy but lower than the North-West; on the other hand, Eastern States receive each year NFFs which on average are included between 5.5% and 7.8% of their GDP. On the whole, our estimates turn out to be fairly consistent with the ones by Henkel *et al.* (2018) and Baskaran *et al.* (2017), which respectively assess overall interregional transfers operated by the state equalization system (*Länderfinanzausgleich*) at around 26.5 billion Euros in 2010 and 20 billion Euros in 2011.

From inspection of Tables 1 and 2, redistribution operated through public financial flows in Italy looks significantly higher than in Germany, in both absolute and per capita terms, and as shares to GDP. However some cautiousness is needed in assessing the actual redistributive weight of NFFs calculated above, due to limited data comparability. In particular, as mentioned in Section 1, the exclusion of social security from the computation of NFFs is not neutral because of its different redistributive impact in the two countries. For Italy, Giannola *et al.* (2017) show that including social security contributions and payments would magnify the Southern NFF in years 2000-2014 by not more than 5% and slightly reduce positive NFFs in North-East. The reason is that in the most affluent regions of the country both social security revenues and outlays (mainly pensions) are higher than in the South. Conversely, the distributional impact of social security is more important in Germany, where social benefits' expenditure is evaluated to account for a much more significant share of transfers to Eastern Länder. In particular, according to Ragnitz (2003), social security would represent about 45% of gross transfers toward Länder of East Germany, which would amount to between 90 and 110 billion Euros per year over the time span 1993-2003. Looking at a similar aggregate, Jansen (2004) finds that the peak of inter-regional redistribution flows occurred in 1995, when 115 billion Euros were transferred from the Western to Eastern Länder, and that in following years transfers were steadily reduced (83 billion Euros in 2002). For Buettner

(2002), the size of the German social security, specifically the unemployment insurance and the mandatory pension system, is rather large, with contributions summing to 1.67% and benefits to 2.14% of GDP in 1990. This determines substantial income transfers to long-term unemployed workers mostly concentrated in the East, financed by the federal budget. Finally, Rosenfeld (2010) estimates that social security covers about 30% of transfers to Eastern Länder in years 2003-2005. More generally, lack of adequate data at Land level prevents from drawing a complete picture of total transfers (i.e. inclusive of social security flows) and interregional redistribution in Germany over the last decades. The available evidence seems however to suggest a strong commitment in financing the Eastern convergence in per capita income in the first 10-15 years after unification, followed by a progressive decline in the last decade.

### 3.2. *Region and Land NFFs*

A more detailed description of regional transfers is given in Tables 3 to 5, where NFFs over the triennia 2007-2009, 2010-2012 and 2013-2015 for Italian regions (panel A) and German Länder (panel B) are reported with data reported in absolute terms, i.e. annual average NFFs in 2010 constant prices (Table 3), per capita values (Table 4) and shares to regional GDP (Table 5).

The greater detail allows to single out some features of the transfers' pattern across regions. Considering for example the donor regions (always located in Northern and Central Italy or Western Germany), Lombardy stands out among both Italian regions and German Länder, as the only case for which yearly positive per capita NFFs are always around or over 3,000 Euros (at 2010 constant prices), while Emilia Romagna and Hamburg NFFs are between 2,000 and 3,000 Euros per year; Veneto, Liguria, Tuscany and Latium positive per capita transfers are mostly between 1,000 and 2,000 Euros per year; Piedmont, Baden-Württemberg, Bayern, and Hessen NFFs mainly between 500 and 1,000 Euros per year. Concerning beneficiary regions, two regions in Centre-North of Italy (Bolzano and Umbria) and five Western States in Germany (Niedersachsen, Rheinland-Pfalz, Saarland, Schleswig-Holstein and Bremen) show light negative NFFs (less than 1,000 Euros per year), while Abruzzo in Southern Italy and Friuli (a special statute region in the North) together with the Eastern Länder Brandenburg, Mecklenburg-Vorpommern, Sachsen, Sachsen-Anhalt, Thüringen, and in most years Berlin present negative per capita NFFs between 1,000 and 2,000 Euros per year. Negative NFFs in absolute value are much higher (between 2,000 and 4,500

TAB. 3. *NFFs by Italian region and German Land (2007-2015, annual averages), millions Euros (2010 constant prices)*

A – Italian regions (a)	2007-2009	2010-2012	2013-2015
Piedmont (NOS)	4,525	3,059	726
Aosta Valley (NSS)	-376	-252	22
Lombardy (NOS)	36,062	27,593	29,855
Trento (NSS)	-1,599	-1,445	-1,670
Bolzano (NSS)	-618	-170	-100
Veneto (NOS)	6,153	7,812	6,190
Friuli (NSS)	-1,111	-1,977	-1,770
Liguria (NOS)	1,429	2,048	2,098
Emilia Romagna (NOS)	9,418	12,278	11,211
Tuscany (COS)	3,530	3,846	4,594
Umbria (COS)	-864	-168	-61
Marche (COS)	-559	146	446
Latium (COS)	9,401	8,041	5,590
Abruzzo (SOS)	-1,867	-1,971	-1,219
Molise (SOS)	-904	-918	-786
Campania (SOS)	-18,905	-15,498	-16,277
Apulia (SOS)	-9,987	-9,376	-8,510
Basilicata (SOS)	-2,223	-1,766	-1,021
Calabria (SOS)	-8,726	-8,720	-7,443
Sicily (SSS)	-17,915	-17,114	-16,688
Sardinia (SSS)	-4,864	-5,446	-5,186
B – German Länder (b)	2007-2009	2010-2012	2013-2015
Baden-Württemberg (WL)	8,944	9,948	8,821
Bayern (WL)	8,021	12,212	14,644
Brandenburg (E)	-4,057	-3,869	-3,428
Hessen (WL)	6,815	3,436	4,717
Mecklenburg-Vorpommern (E)	-2,896	-2,786	-2,648
Niedersachsen (WL)	-2,433	-2,166	-2,307
Nordrhein-Westfalen (WL)	2,504	206	-2,799
Rheinland-Pfalz (WS)	-2,268	-2,636	-1,959
Saarland (WS)	-579	-662	-634
Sachsen (E)	-6,302	-5,586	-6,104
Sachsen-Anhalt (E)	-4,066	-2,307	-3,502
Schleswig-Holstein (WS)	-1,512	-1,708	-1,627
Thüringen (E)	-4,112	-3,704	-3,153
Berlin	-3,032	-4,306	-4,418
Bremen (WC)	-129	-241	-107
Hamburg (WC)	5,102	4,189	4,504

*Notes:* For Italian regions: NOS stands for Northern Ordinary Statute, NSS Northern Special Statute, COS Central Ordinary Statute, SOS Southern Ordinary Statute, SSS Southern Special Statute. For German Länder: WL stands for Western Large, WS Western Small, E Eastern, WC Western City.

*Source:* (a) Own elaboration on Regional Public Accounts and ISTAT; (b) Own elaboration on Federal Ministry of Finance, Statistisches Landesamt Baden-Württemberg and Deutsche Bundesbank.

Euros per year) in many Southern Italy regions as well as in the special statute Aosta Valley region and Trento province, both in Northern Italy.

Even at a first glance, geographical localization and per capita income come up to be not the unique relevant factors to determining NFFs. Par-

TAB. 4. *NFFs by Italian region and German Land (2007-2015, annual averages), per capita Euros (2010 constant prices)*

A – Italian regions (a)	2007-2009	2010-2012	2013-2015
Piedmont (NOS)	1,046	701	160
Aosta Valley (NSS)	-2,993	-1,991	174
Lombardy (NOS)	3,812	2,859	3,008
Trento (NSS)	-3,139	-2,767	-3,124
Bolzano (NSS)	-1,265	-334	-199
Veneto (NOS)	1,287	1,611	1,262
Friuli (NSS)	-915	-1,621	-1,444
Liguria (NOS)	907	1,302	1,328
Emilia Romagna (NOS)	2,226	2,839	2,535
Tuscany (COS)	977	1,049	1,232
Umbria (COS)	-1,000	-190	-69
Marche (COS)	-367	95	288
Latium (COS)	1,760	1,470	977
Abruzzo (SOS)	-1,441	-1,507	-913
Molise (SOS)	-2,850	-2,919	-2,505
Campania (SOS)	-3,290	-2,689	-2,791
Apulia (SOS)	-2,473	-2,315	-2,088
Basilicata (SOS)	-3,801	-3,047	-1,770
Calabria (SOS)	-4,428	-4,442	-3,775
Sicily (SSS)	-3,598	-3,422	-3,298
Sardinia (SSS)	-2,968	-3,319	-3,132
B – German Länder (b)	2007-2009	2010-2012	2013-2015
Baden-Württemberg (WL)	832	940	826
Bayern (WL)	641	980	1,158
Brandenburg (E)	-1,603	-1,566	-1,397
Hessen (WL)	1,123	571	777
Mecklenburg-Vorpommern (E)	-1,729	-1,721	-1,657
Niedersachsen (WL)	-305	-277	-295
Nordrhein-Westfalen (WL)	140	11	-159
Rheinland-Pfalz (WS)	-562	-665	-489
Saarland (WS)	-561	-658	-640
Sachsen (E)	-1,498	-1,367	-1,508
Sachsen-Anhalt (E)	-1,693	-1,016	-1,564
Schleswig-Holstein (WS)	-534	-607	-576
Thüringen (E)	-1,803	-1,682	-1,461
Berlin	-885	-1,281	-1,284
Bremen (WC)	-195	-366	-163
Hamburg (WC)	2,885	2,412	2,567

Notes: See Table 3.

Source: See Table 3.

ticularly in Italy, regional administrative status and Land area matter: some Northern Italian high-income regions show negative and large NFFs, whereas in the South small regions like Molise and Basilicata record negative per capita NFFs much greater than respectively neighboring regions Abruzzo and Apulia, which have similar values of per capita GDP. Conversely, size and city status seem to be of minor importance in Germany, even if Western

TAB. 5. *NFFs by Italian region and German Land (2007-2015, annual averages), % GDP*

A – Italian regions (a)	2007-2009	2010-2012	2013-2015
Piedmont (NOS)	3.5	2.5	0.6
Aosta Valley (NSS)	-8.4	-5.6	0.5
Lombardy (NOS)	10.4	8.0	8.9
Trento (NSS)	-9.1	-8.2	-9.5
Bolzano (NSS)	-3.3	-0.8	0.5
Veneto (NOS)	4.1	5.4	4.3
Friuli (NSS)	-3.1	-5.7	-5.2
Liguria (NOS)	2.9	4.4	4.7
Emilia Romagna (NOS)	6.6	8.8	8.1
Tuscany (COS)	3.3	3.6	4.4
Umbria (COS)	-3.7	-0.8	-0.3
Marche (COS)	-1.3	0.4	1.2
Latium (COS)	4.9	4.4	3.2
Abruzzo (SOS)	-5.9	-6.4	-4.1
Molise (SOS)	-13.2	-14.3	-13.7
Campania (SOS)	-17.5	-15.5	-17.0
Apulia (SOS)	-13.9	-13.6	-12.7
Basilicata (SOS)	-19.2	-16.4	-9.0
Calabria (SOS)	-25.2	-26.8	-24.4
Sicily (SSS)	-19.4	-19.6	-20.3
Sardinia (SSS)	-14.2	-16.6	-16.6
B – German Länder (b)	2007-2009	2010-2012	2013-2015
Baden-Württemberg (WL)	2.4	2.4	1.8
Bayern (WL)	1.9	2.5	2.5
Brandenburg (E)	-7.7	-6.7	-5.2
Hessen (WL)	2.9	1.5	1.8
Mecklenburg-Vorpommern (E)	-8.5	-7.7	-6.5
Niedersachsen (WL)	-1.1	-0.9	-0.8
Nordrhein-Westfalen (WL)	0.4	0.0	-0.4
Rheinland-Pfalz (WS)	-2.1	-2.2	-1.4
Saarland (WS)	-1.9	-2.1	-1.9
Sachsen (E)	-6.8	-5.5	-5.2
Sachsen-Anhalt (E)	-8.2	-4.3	-6.1
Schleswig-Holstein (WS)	-2.1	-2.2	-1.8
Thüringen (E)	-8.9	-7.2	-5.2
Berlin	-3.1	-3.9	-3.5
Bremen (WC)	-0.4	-0.8	-0.3
Hamburg (WC)	5.4	4.3	4.1

Notes: See Table 3.

Source: See Table 3.

Small States are often characterized by negative NFFs, despite relatively high levels of per capita GDP.

Finally, regarding Italy, data in Tables 3-5 show a clear continuous downward drift of (absolute value) fiscal transfers for almost all the Southern regions. As a matter of fact, comparing NFFs between 2007-2009 and 2013-2015 in Table 4, we notice that Basilicata and Abruzzo undergo massive



reduction of respectively 53% and 37%<sup>13</sup>. Similarly, NFFs shrink by 16% in Apulia, 15% in Campania and Calabria, 12% in Molise and 8% in Sicily; only minor changes are recorded for Sardinia. Obviously, smaller positive NFFs for Centre-North regions offset smaller negative NFFs in the South.

Summarizing, data displayed in Tables 3-5 are broadly consistent with those of Tables 1-2. On the basis of this evidence we can argue that the largest positive and negative regional NFFs are recorded in Italy, precisely for Lombardy as donor and Southern and special statute regions as beneficiaries. Also, the role played in determining NFFs by regions' land area and administrative status looks more important in Italy than Germany. Finally, at least in the period under consideration, dynamics of per capita NFFs have been stronger in Italy: despite the global crisis strikes that country (and its Southern regions in particular) more severely than Germany, interregional transfers substantially plunge.

### 3.3. *NFFs and interregional redistribution*

Hinging on data of Table 4, in this section a simple econometric exercise is carried out to estimate the relationship between per capita NFFs and per capita GDP in Italian regions and German Länder across years 2007-2015. Our purpose is to outline a preliminary evaluation of the intensity of redistribution operated through public fiscal flows in the two countries. However, given the serious limitations of the dataset, we do not aim at supplying a causal interpretation of possible links between public financial transfers and regional income (for example, in terms of effects of policies aiming at territorial rebalancing), but rather at providing evidence to be interpreted merely in terms of correlation between the variables considered.

To perform this task, regional NFFs computed as explained in Section 2 are used to estimate the equation

$$(2) \quad nff_{it} = \alpha + \beta y_{it}$$

Where  $nff_{it}$  and  $y_{it}$  are respectively per capita NFF and per capita GDP in the region or Land  $i$  at time  $t$ , and the estimated parameter  $\hat{\beta}$  measures the average change in per capita NFF for a unit change in per capita GDP. It is easy to verify that  $\hat{\beta}$  may be seen as a direct measure of redistribution,

<sup>13</sup> For Abruzzo, the fall is even larger (39%) between 2010-2012 and 2013-2015, as in the first triennium transfers increased following the earthquake of L'Aquila in 2009.

TAB. 6. *Estimating interregional redistribution in Italy and Germany*

Years	Country and sample	Constant	$\hat{\beta}$	$R^2$	obs.
2007-2015	Italy (whole sample)	-6,267.5 (490.79)	.2043 (.0180)	0.408	189
	Germany (whole sample)	-3,786.1 (183.38)	.1032 (.0053)	0.7263	144
	Italy (reduced sample)	-8812.4 (328.01)	.3323 (.0125)	0.8412	135
	Germany (reduced sample)	-4,082.1 (201.09)	.1161 (.0064)	0.7387	117
2007-2009	Italy (whole sample)	-7,114.2 (939.99)	.2191 (.0331)	0.4182	63
	Germany (whole sample)	-4,135.2 (274.22)	.1276 (.0089)	0.8180	48
2010-2012	Italy (whole sample)	-6,508.9 (849.85)	.2130 (.0312)	0.4336	63
	Germany (whole sample)	-3,987.3 (313.79)	.1100 (.0093)	0.7542	48
2013-2015	Italy (whole sample)	-57,899.7 (747.87)	.2031 (.0287)	0.4507	63
	Germany (whole sample)	-4,305.1 (254.10)	.1067 (.0067)	0.8486	48

Note: Standard errors in brackets. All coefficients are statistically significant at 1% level.

with  $\hat{\beta} = 1$  implying a constant value of  $(y - nff)$ , and therefore full redistribution<sup>14</sup>.

The results of the econometric exercise are displayed in Table 6, with reference to sub-periods 2007-2009, 2010-2012 and 2013-2015, and the overall time span 2007-2015. In the latter case, distinct estimates are shown for the whole sample and the subsample without Italian special statute regions and German City States (Berlin, Bremen and Hamburg). The key results of the analysis are the following: first, the values of all estimated regression coefficients are positive, with a very high level of statistical significance, showing that in both countries some redistribution is at work, be it a result of a deliberate political action or only an effect of progressive taxation. Second, coefficients are on the whole pretty lower than 1, showing that redistribution operated through fiscal transfers is rather moderate. In particular, comparing coefficients values, those of Italy turn out to be always higher than the German ones, with differences being larger when excluding special statute regions and city states, and quite stable throughout the period considered.

<sup>14</sup>  $(y - nff)$  is a broad-sense per capita disposable income. If changes in per capita GDP are fully neutralized by one-to-one changes in per capita NFF, i.e.  $\hat{\beta} = 1$ , redistribution is complete; if  $\hat{\beta} < 1$ , only partial redistribution occurs. This is a standard interpretation in the literature (Bayoumi and Masson, 1995). For further details see Giannola *et al.* (2016).

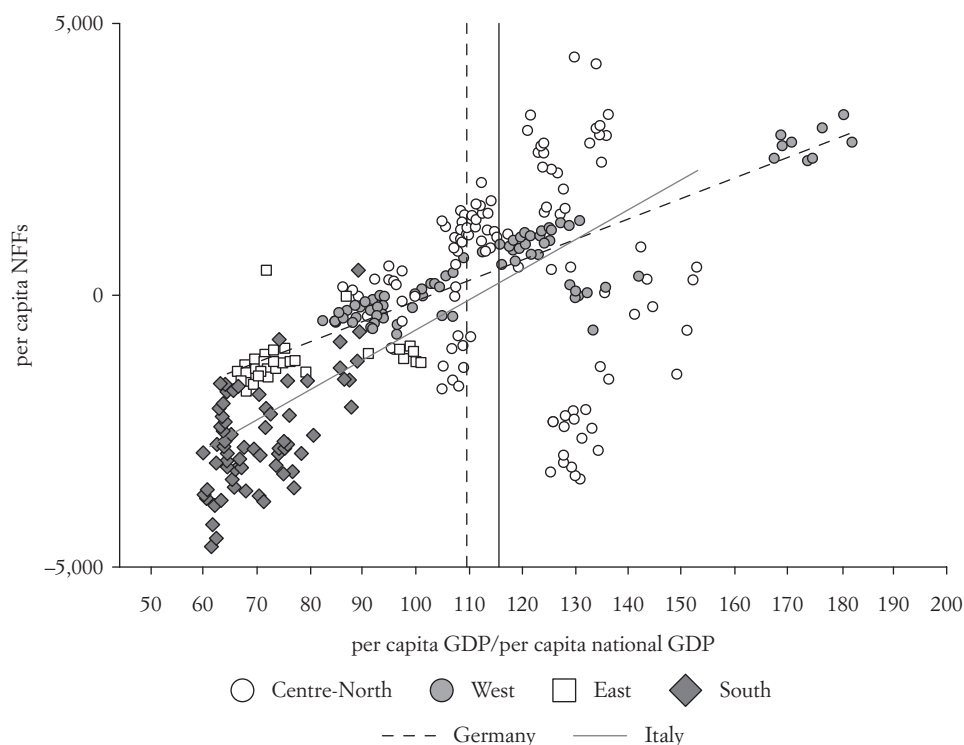


FIG. 1. Per capita NFFs and per capita GDP (2010 constant prices), 2007-2015.

Moreover,  $R^2$  statistics are in most cases higher in Germany than Italy; also, they rise (particularly in the case of Italy) when regressions are run on the reduced samples, confirming that special statute and land area are relevant variables in determining NFFs especially in Italy. As a consequence, when all regions and Länder are considered, the explanatory power of income for NFFs gets relatively lower, and redistribution operated by the public sector decreases.

The indications supplied by this simple econometric exercise are consistent with those of the descriptive analysis of Sections 3.1 and 3.2. and seem to indicate that through larger NFFs, in Italy the public sector has played a more relevant role in the redistribution of financial resources from high-income to low-income areas, even if again this result is attenuated by the presence of special statute regions. To check the robustness of this finding, we reconsider the relationship between regional per capita NFF and per capita GDP by defining the latter in terms of ratio to per capita national GDP.

Figures 1-4 represent regional per capita NFF and relative per capita GDP (a variable taking value  $x$  if regional per capita GDP equals  $x\%$  of na-

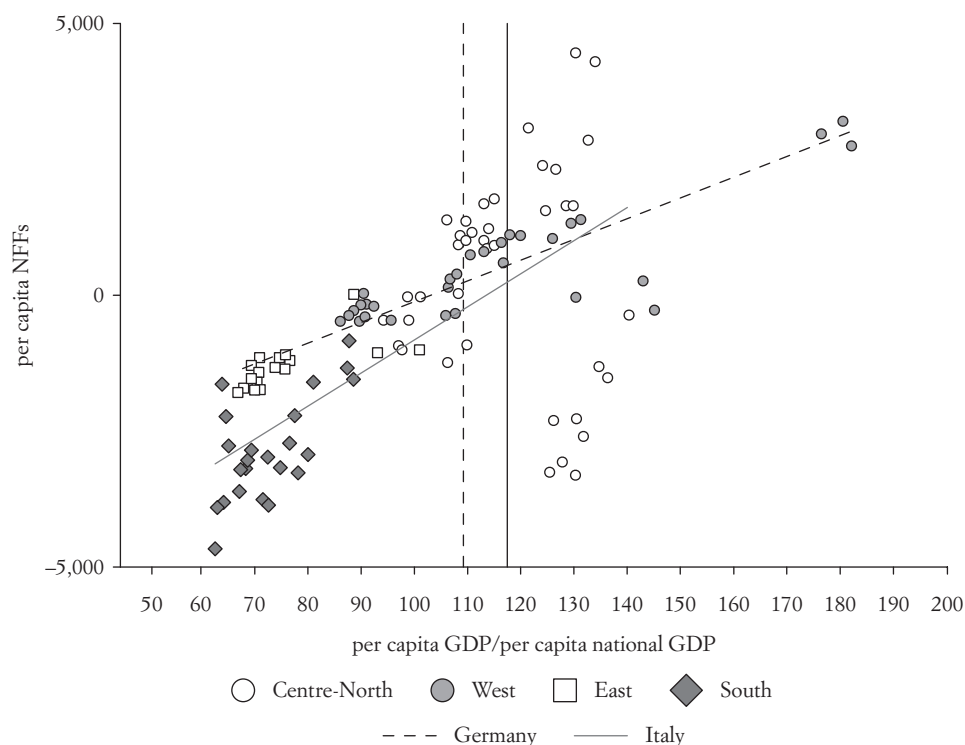


FIG. 2. Per capita NFFs and per capita GDP (2010 constant prices), 2007-2009.

tional GDP) for Italian regions and German Länder. While Figure 1 refers to the whole period 2007-2015, Figures 2, 3 and 4 respectively concern the sub-periods 2007-2009, 2010-2012 and 2013-2015. Observations are indicated by different geometric shapes (squares, rhombuses or circles) denoting macro-regions (East and West Germany, and South and Centre-North Italy). Upward sloping straight lines are the regression lines: the dotted ones refer to Germany, the solid ones to Italy. Vertical straight lines single out the value of the ratio of regional per capita GDP to national per capita GDP at which the regression line cuts the zero per capita NFF line (dotted lines refer to Germany, solid ones to Italy). This value corresponds to the level of relative per capita GDP from which a region is expected to record a positive NFF and therefore to be a net contributor to interregional redistribution.

Scrutiny of Figures 1-4 confirms a stronger attitude to interregional redistribution in Italy, showing steeper regression lines. However, the vertical thresholds beyond which a region becomes a net contributor are always higher than 115% of national GDP for Italian regions, and lower than 110%

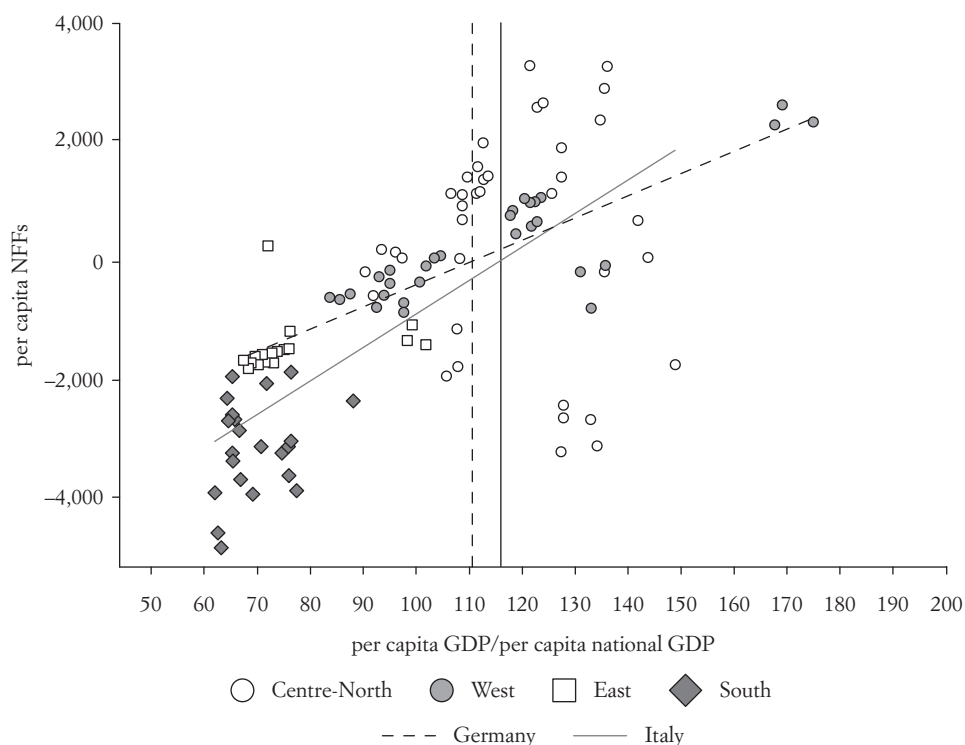


FIG. 3. Per capita NFFs and per capita GDP (2010 constant prices), 2010-2012.

for German Länder. This means that if the burden for contributing regions increases faster in Italy as relative regional income increases, the threshold from which on average a region becomes a donor is significantly lower in Germany. Another interesting finding concerns time dynamics. As clearly displayed by Figures 2, 3 and 4, differences in regression lines' slope tend to fade out when moving from 2007-2009 to 2010-2012 and then 2013-15. Indeed, while the slope of the regression line for Germany remains basically unaltered, for Italy it is around 1.60 times the value of Germany in 2007-2009, to decline to 1.52 in 2010-2012 down to 1.28 in 2013-2015.

Information supplied by Figures 1-4 adds more complexity to the comparison of the relative importance of NFFs in Italy and Germany and its impact on interregional redistribution, and makes difficult a conclusive judgment on the actual intensity of interregional redistribution operated through fiscal transfers in the two countries. Finally, in a dynamic perspective, the redistributive stance of Germany looks relatively stable, whereas in Italy the strong reduction in NFFs seems to bring about a severe downsizing of interregional redistribution.

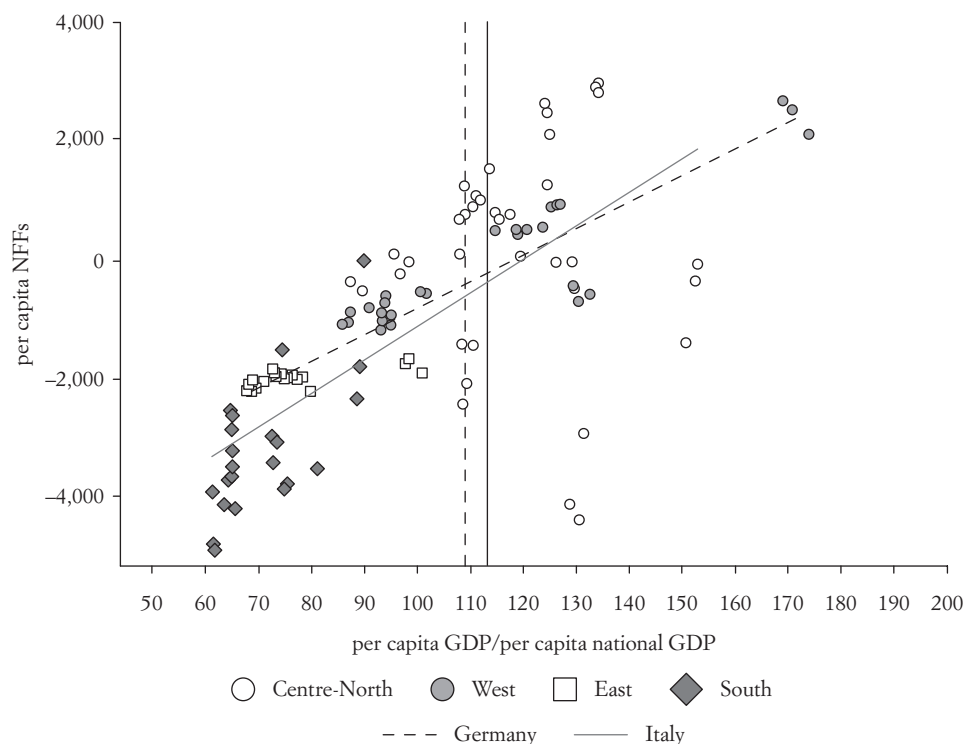


FIG. 4. Per capita NFFs and per capita GDP (2010 constant prices), 2013-2015.

#### 4. *Concluding remarks*

This paper supplies some new evidence on the size of regional and macro-regional NFFs in Italy and Germany in years 2007-2015, and a tentative evaluation of the interregional redistributive action operated by the public sector through fiscal transfers in the two countries.

Although the comparison is made difficult by the limited comparability of data, this investigation shows that on the whole NFFs have been higher and their redistributive impact stronger in Italy. In fact, with respect to Germany, Italian regional NFFs come out to be larger in absolute and per capita terms, and also as shares to local GDP, while a simple econometric exercise estimates higher value for coefficients accounting for interregional redistribution.

The relative stronger interregional redistribution in Italy is confirmed by the evidence that the burden for contributing Italian regions increases faster as relative regional income increases as compared to contributing German Länder. On the other hand, the threshold from which on average a region

becomes a donor is significantly lower in Germany. Finally, the redistributive stance of Germany looks relatively stable during the period, whereas in Italy the strong reduction in NFFs seems to bring about a severe downsizing of interregional redistribution.

## References

- Agency for Territorial Cohesion (various years), *Relazione Annuale CPT*, Rome.
- Ambrosanio, M.F., Bordignon, M. and Cerniglia, F. (2010), Constitutional reforms, fiscal decentralization and regional flows in Italy, in N. Bosch, M. Espasa and A. Solé Ollé (eds.), *The Political Economy of Inter-regional Fiscal Flows. Measurement, Determinants and Effects on Country Stability*, Cheltenham, UK, Edward Elgar Publishing.
- Arachi, G., Ferrario, C. and Zanardi, A. (2010), Regional redistribution and risk sharing in Italy: The role of different tiers of government, *Regional Studies*, 44(1), 55-69.
- Baskaran, T., Feld, L.P. and Necker, S. (2017), Depressing dependence? Transfers and economic growth in the German States, 1975-2005, *Regional Studies*, 51(12), 1815-1825.
- Bayoumi, T. and Masson, P. (1995), Fiscal flows in the United States and Canada: Lessons for Monetary Union in Europe, *European Economic Review*, 39(2), 253-274.
- Bird, R.M. and Tarasov, A.V. (2004), Closing the gap: fiscal imbalances and inter-governmental transfers in developed federations, *Environment and Planning C: Government Policy*, 22(1), 77-102.
- Boadway, R. and Shah, A. (2007), *Intergovernmental Fiscal Transfers: Principles and Practice*, Washington, DC, World Bank.
- Boltho, A., Carlin, W. and Scaramozzino, P. (1997), Will East Germany become a new Mezzogiorno?, *Journal of Comparative Economics*, 24(3), 241-264.
- Boltho, A., Carlin, W. and Scaramozzino, P. (2018), Why East Germany did not become a new Mezzogiorno, *Journal of Comparative Economics*, 46(1), 308-325.
- Bosch, N. and Espasa, M. (2017), The redistributive, stabiliser and insurance effects at territorial level of federal government budgets, *Politica Economica – Journal of Economic Policy*, XXXIII(3), 345-374.
- Bosch, N., Espasa, M. and Sorribas, P. (2002), The redistributive, stabiliser and insurance effects at territorial level of federal government budgets, *IEB Working Paper*, No. 5.
- Buettner, T. (2002), Fiscal federalism and interstate risk sharing: Empirical evidence from Germany, *Economics Letters*, 74(2), 195-202.
- Buettner, T. (2006), The finances of the German States, *Revista Catalana De Dret Públic*, 32, 211-232.
- Burda, M.C. and Severgnini, B. (2018), Total factor productivity convergence in German states since reunification: Evidence and explanations, *Journal of Comparative Economics*, 46(1), 192-211.
- Castells, A. (1998), Integració monetària i desequilibris territorials a la Unió Europea, *Revista Econòmica de Banca Catalana*, 114, 19-45.



- Decressin, J. (2002), Regional income redistribution and risk sharing: How does Italy compare in Europe?, *Journal of Public Economics*, 86(2), 287-306.
- Department for Development Policies (various years), *Rapporto Annuale*, Rome.
- De Simone, E. and Liberati, P. (2019), Does redistribution matter? The decomposition of the fiscal residuum in Italian regions, *Regional Studies*, DOI: 10.1080/00343404.2019.1603367.
- Federal Ministry of Finance (2017), *Financial Relations between the Federation and Länder on the Basis of Constitutional Financial Provisions*, Berlin.
- Ferrario, C. and Zanardi, A. (2011), From interpersonal to interregional redistribution: The case of social policies in Italy, in E. Ongaro, A. Massey, M. Holzer and E. Wayenberg (eds.), *Policy, Performance and Management in Governance and Intergovernmental Relations. Transatlantic Perspectives*, Cheltenham, UK, Edward Elgar Publishing.
- Giannola, A., Petraglia, C. and Scalera, D. (2011), Residui fiscali regionali e riforma federalista. Quanto residuerà delle politiche regionali e redistributive?, *Rivista Economica del Mezzogiorno*, 25(1-2), 29-56.
- Giannola, A., Petraglia, C. and Scalera, D. (2016), NET fiscal flows and interregional redistribution in Italy: A long-run perspective (1951-2010), *Structural Change and Economic Dynamics*, 39(C), 1-16.
- Giannola, A., Petraglia, C. and Scalera, D. (2017), Residui fiscali, bilancio pubblico e politiche regionali, *Italian Journal of Public Economics*, 2, 33-57.
- Giannola, A. and Scalera, D. (1995), L'autonomia finanziaria delle regioni e gli effetti delle politiche di riequilibrio della finanza pubblica, *Studi Economici*, 55, 153-171.
- Giannola, A. and Stornaiuolo, G. (2018), Un'analisi delle proposte avanzate sul «federalismo differenziato», *Rivista Economica del Mezzogiorno*, 32(1-2), 5-52.
- Hall, J.B. and Ludwig, U. (2006), Economic convergence across German regions in light of empirical findings, *Cambridge Journal of Economics*, 30(6), 941-953.
- Henkel, M., Seidel, T. and Suedekum, J. (2018), Fiscal Transfers in the Spatial Economy, *CESifo Working Paper Series*, No. 7012.
- Hughes Hallett, A.J. and Ma, Y. (1993), East Germany, West Germany, and their Mezzogiorno problem: A parable for European economic integration, *Economic Journal*, 103(417), 416-428.
- Jansen, H. (2004), Transfers to Germany's Eastern Länder: A necessary price for convergence or a permanent drag?, *ECFIN Country Focus*, 1(16).
- MacDougall, D. (1977), *Rapport du groupe de réflexion sur le rôle des finances publiques dans l'intégration européenne*, Luxembourg, Commission des Communautés Européennes. Available at: [https://www.cvce.eu/obj/le\\_rapport\\_macdougall\\_volume\\_i\\_bruxelles\\_avril\\_1977-fr-c475e949-ed28-490b-81ae-a33ce9860d09.html](https://www.cvce.eu/obj/le_rapport_macdougall_volume_i_bruxelles_avril_1977-fr-c475e949-ed28-490b-81ae-a33ce9860d09.html).
- Mansell, R. and Schlenker, R. (1995), The provincial distribution of federal fiscal balances, *Canadian Business Economics*, 3, 3-19.
- Martinelli, F. (2013), The Southern Question in Italy. Regional development discourses and strategies from «national» policy to «Euro-local» programmes, in F. Martinelli, F. Moulaert and A. Novy (eds.), *Urban and Regional Development Trajectories in Contemporary Capitalism*, London-New York, Routledge.
- Méltiz, J. and Zumer, F. (1998), Redistribution régionale et stabilisation par le gouvernement central, *Économie Internationale*, 75(3), 3-31.

- Obstfeld, M. and Peri, G. (1998), Regional non-adjustment and fiscal policy, *Economic Policy*, 13(26), 205-259.
- Petraglia, C., Pierucci, E. and Scalera, D. (2018), Redistribution and risk-sharing in Italy: Learning from the past, *Regional Studies*, 52(2), 285-297.
- Ragnitz, J. (2003), Wie hoch sind die Transferleistungen für die neuen Länder?, *IWH Pressemitteilung*, No. 21.
- Rodden, J.A. (2010), Federalism and inter-regional redistribution, in N. Bosch, M. Espasa and A. Solé Ollé (eds.), *The Political Economy of Interregional Fiscal Flows. Measurement, Determinants and Effects on Country Stability*, Cheltenham, UK, Edward Elgar Publishing.
- Rosenfeld, M. (2010), *Finanzausgleich/Finanztransfers Ostdeutschland*, available at: <http://www.bpb.de/geschichte/deutsche-einheit/lange-wege-der-deutschen-einheit/47388/finanzausgleich?p=all>.
- Ruggeri, G.C. (2010), Interregional fiscal flows: Measurement tools, in N. Bosch, M. Espasa and A. Solé Ollé (eds.), *The Political Economy of Interregional Fiscal Flows. Measurement, Determinants and Effects on Country Stability*, Cheltenham, UK, Edward Elgar Publishing.
- Sinn, H.-W. and Westermann, F. (2001), Two Mezzogiornos, *NBER Working Paper*, No. 8125.
- UPB – Ufficio Parlamentare di Bilancio (2017), *Audizione del Presidente dell'Ufficio parlamentare di bilancio in merito alla distribuzione territoriale delle risorse pubbliche per aree regionali*, 22 novembre, Rome.
- Viesti, G. (2019), *Verso la secessione dei ricchi? Autonomie regionali e unità nazionale*, Bari, Laterza.
- Vittorino, G. (2019), Inter-regional redistribution and fiscal policy in Italy, *Politica Economica – Journal of Economic Policy*, XXXV(2), pp. 267-310.
- Volpe, M., Cristofaro, L., De Luca, S., Iorio M.R., Nusperli, F., Scaglioni, C., Sferrazzo, A., Silvestrelli, F. and Tancredi, A. (2007), *Guide to the Regional Public Accounts. Methodological and Operational Aspects of the Construction of the Consolidated Public Accounts at the Regional Level*, Rome, Italian Ministry of Economic Development.