

# MEASURING REGIONAL MULTIPLIERS: A COMPARISON BETWEEN TWO DIFFERENT METHODOLOGIES FOR THE CASE OF THE ITALIAN REGIONS

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## 1. INTRODUCTION<sup>1</sup>

Keynesian multipliers represent one of the most famous concepts in economic theory. Starting from the pioneering contribution by Isles and Cuthbert (1956), many authors tried to apply Keynesian multipliers to the regional context.

During the 50s, and even more so during the 60s<sup>2</sup> and 70s<sup>3</sup>, regional economists started debating the usefulness of Keynesian multipliers at a sub-national level. The application of different models of regional Keynesian multipliers was prolific until the end of the 80s<sup>4</sup>. Since then, their popularity has waned to the advantage of input-output techniques that allow for both internal and external regional linkages among industrial sectors. The advances in collecting, storing and manipulating data has made the input-output analysis a powerful instrument to assess intraregional economic interconnections on one side, and to catch the so-called *interregional spillover effects* on the other (Miller, 1998)<sup>5</sup>.

However, does this imply that Keynesian multipliers are an out-of-date concept? To what extent can they be applied to trace the effects of changes in demand on economic activity at a regional level?

Despite the improvement in data availability, it is still difficult to gather specific information at a high level of spatial disaggregation. Moreover, the choice of a specific technique always depends on the main focus of the analysis. Keynesian multipliers might become a powerful tool when aggregate data is not available and the main aim of the analysis is to investigate horizontal regional disparities rather than absolute values. In light of this fact, it is worth re-considering the role of regional multipliers and whether or not they can generate meaningful predictions for implementing regional policies.

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<sup>2</sup> See Brown (1967), Archibald (1967), Wilson (1968), Weiss and Gooding (1968), Allen (1969), Steel (1969)

<sup>3</sup> See Greig (1971a and 1971b), Lever (1974a, 1974b and 1975), McDowall (1975), Swales (1975), Sinclair and Sutcliffe (1977a, 1977b and 1978), Isserman (1977)

<sup>4</sup> In this respect see, for instance, Black (1981), Ashcroft and Swales (1982), Sinclair and Sutcliffe (1982, 1983 and 1988), Catin (1984), Nairn and Swales (1987), Kampmann (1988) and Poffet (1989)

<sup>5</sup> Two approaches can be retraced in the regional Input-Output literature: the uniregional and the multiregional approach. The second can be subdivided into interregional input-output (IRIO) and multiregional input-output model (MRIO). The former considers all the bilateral transactions between an origin sector in one region and the destination sector in another. The latter ignore the information on the destination sector (Miller 1998).

The aim of this paper is twofold. First, we estimate the multipliers for the twenty Italian regions by comparing two different methodologies belonging to the regional Keynesian framework, here named "Marginal propensities method" (MPM) and "Aggregate leakages method" (ALM). Second, we provide some possible interpretations of the results achieved through the linkage between the multipliers and some structural and economic characteristics of the Italian regions (i.e. their size, main local activities and relationships with other regions or foreign countries in terms of exports). The results of these applications are in some cases counter-intuitive. However, they are consistent with similar findings for the Italian case<sup>6</sup>.

The organisation of this paper is as follows:

- ❖ section 2 introduces the concept of Keynesian multipliers at both a national and regional level;
- ❖ section 3 describes the database used;
- ❖ section 4 describes the two methodologies used to calculate regional multipliers and compare the results obtained for the Italian regions;
- ❖ section 5 provides some possible economic interpretations of the results achieved;
- ❖ section 6 finishes with some policy implications and conclusions.

## 2. KEYNESIAN AUTONOMOUS EXPENDITURE MULTIPLIERS

### 2.1 The national level

Since the concept of national multipliers is very well known we shall simply give a brief summary of its basic principles. The autonomous expenditure multiplier is generally defined as the amount by which a change in autonomous expenditure is multiplied to calculate the change in equilibrium aggregate expenditure and real GDP.

The multiplier can be expressed as

$$k = \Delta Y / \Delta A = \frac{1}{1 - (c - m)(1 - t)} \quad (1)$$

where Y is the GDP, A is the autonomous expenditure, c is the marginal propensity to consume, m is the marginal propensity to import from abroad and t is the marginal tax rate.

As far as the marginal tax rate is concerned, it must be noticed that indirect and direct taxes do not affect the final income in the same way. Direct taxation reduces the disposable income, while indirect taxes affect consumption. Therefore total direct taxation is equal to  $T_d = t_d Y$ , while indirect taxation is  $T_i = t_i C$ , assuming all indirect taxation falls on consumption, as is the case in most of the multipliers related literature<sup>7</sup>.

Taking this into account, the final formula of the multiplier becomes

$$k = \frac{1}{1 - c(1 - m - t_i)(1 - t_d)} \quad (2)$$

where  $t_d$  is the rate of direct taxation and  $t_i$  represents the rate of indirect taxation.

We expect the value of the multiplier to be greater than 1 because an increase in the level of aggregate demand does not only generate direct effects, but also indirect and induced effects. The real problem in calculating the value of the multipliers is the exact quantification of all these

<sup>6</sup> See Casini Benvenuti and Marangoni (1999).

<sup>7</sup> See Brown (1967), Wilson (1968), Steele (1969), Brownrigg (1971), Lever (1974a, 1974b and 1975), McDowall (1975), Swales (1975), Archer (1976), Sinclair and Suthcliffe (1982)

induced effects. Fortunately, the induced effects become smaller and smaller along the cumulative process and this reduces possible bias due to difficulties in forecasting. Nevertheless it must be kept in mind that the multiplier can only give an outline of the actual increase in the real GDP.

## 2.2 *The regional level: strengths and weaknesses of different methods for regional multipliers estimation*

Regional multipliers are the exact analogue, at a regional level, of the national Keynesian multipliers<sup>8</sup>. They are aggregate multipliers, which means they do not distinguish between the sectors where the initial expenditure changes originate. In this respect, they contrast with input-output multipliers, which have the advantage of being disaggregated by sectors, but have the disadvantage of requiring considerable resources and time to be implemented. The result is that, sometimes, a regional input-output table needs to be updated as soon as it becomes available, because, in the meantime, regional linkages between sectors evolve according to a new pattern. An aggregate multiplier is a much simpler way of drawing a picture of regional macro-characteristics and of drawing the comparison of these among different regions can give very interesting results and guidance for regional policies. Despite the apparent simplicity, the calculation of an aggregate regional multiplier is not such an easy task. Most of the difficulties come from the structure of national accounts. Despite years of advocacy by regional scientists, analogous data to the national one is still generally not available for sub-national spatial units. Therefore, non-survey methods have been developed to estimate the components of regional accounts. Obviously, non-survey methods require a set of basic simplifying assumptions. Most of them, like almost all assumptions by definition, are open to criticism. However, the point is not to debate the truth of these assumptions, but their usefulness. If this is true at a national level of analysis, it seems to be even truer in a regional context where problems increase in number and complexity. Since the different regions belong to the same nation and do not have clear boundaries between them, it is difficult to estimate interregional movements of people, goods and capital.

All the variables in equation (2) must be reinterpreted and adjusted to the regional context. In the Keynesian multipliers literature, the linkages among regions are usually investigated using “interregional trade multipliers” (Isard 1960). Therefore, the first complication concerns the definition of regional imports and exports. The basic difference between national multipliers and regional multipliers is, indeed, the fact that external flows are more important to a region than to a nation. As Stabler (1970) points out “*the size of the area in question has a major bearing on the importance of what phenomena are most important in generating growth*”. Quoting Tiebout (1956) “*the world exports nothing ...on the other hand it is unusual that business enterprises grow without selling external to itself*”.

Imports include not only purchases coming from abroad but also purchases from other regions and the same is true for exports, which now also include interregional sales. The marginal propensity to import can be split into two different parts, one representing the “marginal propensity to import from abroad” ( $m_a$ ) and the other representing the “marginal propensity to import from other regions” ( $m_r$ ).

Regions are less likely to be “self-contained” economies. The benefits of an increase in public expenditure, consumption or investments in a region can easily spread to the neighbouring regions, but the estimation of these “proximity effects” requires advanced spatial econometrics techniques that are beyond the scope of this work. In our basic analysis, we will assume that the only “channels” of interaction between regions are import and export flows. Therefore, we will

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<sup>8</sup> For the concept of regional multipliers see for instance Richardson (1972), Armstrong and Taylor (1985), Camagni (1992), Vanhove (1999), McCann (2001)

implicitly assume that the propensity to consume in a region is not affected by those of the other regions.

Let us define  $Y_j$  as the GDP in region  $j$  (with  $j= 1, 2, \dots, 20$  in the Italian case),  $C_j$  as the consumers' expenditure in region  $j$ ,  $T_{dj}$  as the direct tax payments,  $T_{ij}$  as the indirect tax payments,  $M_{aj}$  as imports for consumptions from abroad and  $M_{rj}$  as imports for consumptions from other Italian regions.

If we assume:

$$C_j = c (Y_j - T_{dj})$$

$$T_{dj} = t_d Y_j;$$

$$T_{ij} = t_i C_j$$

$$M_{aj} = m_a C_j$$

$$M_{rj} = m_r C_j$$

then:

$$Y_j = c Y_j (1 - t_d) (1 - m_a - m_r - t_i) \quad (3)$$

The final form of the regional multiplier becomes

$$k_j = \frac{1}{1 - c_j (1 - m_{ja} - m_{jr} - t_{ji}) (1 - t_{jd})} \quad (4)$$

Historically, two different approaches have been developed to estimate regional multipliers as expressed in equation 4.

On one hand, many authors<sup>9</sup>, especially in the Anglo-Saxon context, have tried to estimate each single component of equation 4, i.e. the regional marginal propensity to consume, marginal propensity to import, both from abroad and from other regions, direct and indirect tax rates. We call this approach "Marginal propensities method" (MPM).

On the other hand, some authors based the calculation of regional multipliers on the idea that the size of multipliers is inversely related to all possible leakages from the local economic system. We call this alternative method "Aggregate leakages method" (ALM)<sup>10</sup>. Instead of estimating the value of each marginal propensity, this technique considers, as a proxy of regional multipliers, the inverse of the percentage of the leakages on the total regional GDP. Four leakages are taken into account: savings, imports from abroad, interregional imports and taxes (both indirect and direct). In a simple closed economy without public sector, savings would be the only leakage. Obviously, regions should not be considered in isolation since they are highly integrated units and thus relationships with other regions or nations must be taken into account. This leads to the second leakage, which is represented by imports. At a national level imports are international imports. In a regional context, as we have already pointed out, we have to take into account both international and interregional imports.

The last leakage is due to the presence of the central Government. Taxes are resources, which are taken away from the regions to finance public expenditure. In this method, it is assumed, for simplicity, that there are no feedbacks into the regions, i.e. public expenditure in a region is not a function of the taxable capacity of the region itself. This hypothesis could be removed by assuming  $G$  not to be a completely autonomous component, but rather a function of the regional taxable capacity; yet again other problems would arise. Are we to suppose that the Government will spend more in the wealthiest regions, which have the highest taxable capacity or, conversely, are we to

<sup>9</sup> See among others Steele (1969), Brownrigg (1971), Greig (1971b), Sinclair and Suthcliffe (1982 and 1988)

<sup>10</sup> See for instance Allen (1969) and Black (1981)

assume that public expenditure is higher in the most depressed regions, which need help? In this paper we will leave the question open by assuming the absence of any feedback effect due to different taxation.

### **3. THE ESTIMATE OF MULTIPLIERS IN THE CASE OF ITALIAN REGIONS: THE DATABASE**

The main aim of this paper is to give an estimation of aggregate regional multipliers for the 20 Italian regions by using both methodologies outlined above, i.e. by using formula 4 and substituting the relevant regional propensities (MPM method) and by using what we call the ALM method in which all the leakages are added together. We are aware of all the limitations concerning an exercise of this kind, but believe it is useful to have a rough idea of the absolute values of regional multipliers in Italy. Since most of the empirical studies in this field have examined the British context, it is interesting to calculate the multipliers for the Italian case and compare the results of the two different contexts. Moreover (and above all) it is important to identify the regional differences in the relative values of multipliers especially with respect to the disparity between the North and South of Italy.

Finding reliable data on which to base our analysis and calculations was the first challenging task. Although aware of the fact that it is better to use the same source for all data to reduce potential biases, we had to rely on different sources for all the data needed. Where possible we used data from the official national statistical office (Istat), but for some data we had to rely on information from private or regional statistical centres, such as the Tagliacarne Institute or the Irpet (Regional Institute for the Economic Planning in Tuscany). A detailed description of the variables used in the empirical part is given below.

#### *3.1 Regional Income*

The first variable needed was a measure of the resources produced in each region. While in works concerning the British context most of the authors<sup>11</sup> opted for the disposable income, we preferred to choose the GDP for different reasons. First of all, the GDP has been - since 1977 - the basic aggregate in the national account system and has been recommended by the UN as the fundamental measure of the “economic capacity” of an economy. The second reason preferring the GDP value is more practical. Especially in the Italian national account system, the value of GDP is much more reliable than that of disposable income. The calculation of disposable income implies a very complex procedure to adjust the GDP value to a proxy of the disposable income. This procedure includes the consideration of all the movements of people to and from the system. The Istat does not have recent data on disposable income of the Italian regions. The most recent data is that produced in 1995 by the Tagliacarne Institute. Though we do not doubt the reliability of this data we preferred the Official source and have therefore chosen the GDP data by Istat for the year 1996<sup>12</sup>.

#### *3.2 Direct and Indirect taxes*

In Italy the major problems of finding data are related to direct taxes. The last available statistics, elaborated by the Ministry of Finance, date back to 1991. Since 1991 the only data available is of some estimates by Irpet. Irpet updated the old Istat data using a two-step procedure. First calculating a percentage of direct taxes on regional GDP using the data related to 1991, second applying this percentage to the new more recent GDP values. We have used the same method to

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<sup>11</sup> See Allen (1969)

<sup>12</sup> See “Conti Economici Territoriali: Conti Regionali 2001”, [www.istat.it](http://www.istat.it)

update the values of direct taxes to 1996. In doing that we paid attention to the changes introduced by the new European account system called Sec95. Payroll taxes are included in direct taxes.

As far as indirect taxes are concerned, regional data for the period 1980-1996 has been recently published by Istat.

### 3.3 *Imports from abroad and interregional imports*

As far as imports from abroad are concerned, data on net imports is obtainable from Istat publications.

The most problematic aspect of all is finding data on interregional trade. As Isard and Langford (1971) point out “*the strategic role of imports and exports in regional analysis has always been appreciated. The importance of obtaining data on total imports and exports and their spatial patterns has rarely been underplayed, in contrast with the national analysis, where the need to analyze and project imports and exports has been recognized to be less important*”.

Istat does not gather statistical data on flows of imports and exports between regions.

In the case of imports between regions, there is an intrinsic difficulty in collecting reliable data due to the fact that no clear borders exist between regions.

Nevertheless, during the 1990s the estimation of an interregional pattern of trade in the case of Italy was carried out by Irpet. The problem was that their data is not easily accessible to the public because it is still unpublished and is the result of a very long and complex research project, but the Irpet itself kindly provided us with the data we needed.

In the past, especially in Great Britain, the most common means of estimating a region's propensity to import was to calculate the extent of self-sufficiency of a region by comparing the percentage of the total national population in the region with the percentage of national employees in consumer goods industries in the same region. If the former is bigger than the latter it means that the region is not self-sufficient and has to import consumer goods from other regions. This was an even cruder method of approaching the actual value of imports.

### 3.4 *Savings and consumptions*

Istat gathers statistical data on regional gross investments and savings and publishes it in the third volume of the national accounts, which is entirely devoted to regional accounts. The regional consumption comes from Istat, *Conti Economici Territoriali: Conti Regionali 2001*<sup>13</sup>, and refers to the final consumption of families residing in the region.

## 4. THE RESULTS ON REGIONAL MULTIPLIERS IN THE ITALIAN REGIONS

### 4.1 *The "Marginal propensities method" (MPM)*

The MPM implies estimating separately all the different propensities included in equation 4. The propensity to consume is calculated as the ratio between total consumption of the families in the region and the regional disposable income. The assumption is that the average consumption is a proxy for the marginal one. The results on marginal propensity to consume are shown in Table 1<sup>14</sup> where the regions have been ranked from the one with the lowest propensity to the one with the highest. Propensities to consume are lower in the Northern regions (with the exception of Liguria and Val d'Aosta) and higher in the Southern regions. This is consistent with the results in Casini

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<sup>13</sup> See the internet website [www.istat.it](http://www.istat.it)

<sup>14</sup> The Northern regions are underlined, the Southern ones are in Italic.

and Marangoni (1999) where they point out that “*the poorer southern regions tend towards a higher level of consumption since almost all their income goes on purchasing consumer goods*” (p.450)

Table 1: Regional marginal propensity to consume

<b><i>Region</i></b>	<b><i>Propensity to consume</i></b>
<u>Lombardy</u>	0.6094050
<u>Emilia R.</u>	0.6499044
<u>Piedmont</u>	0.6501095
<u>Veneto</u>	0.6513496
<u>Friuli V. G.</u>	0.6723207
<u>Lazio</u>	0.6804723
<u>Trentino A. A.</u>	0.6897919
<u>Tuscany</u>	0.7006424
<u>Marche</u>	0.7024202
<i>Basilicata</i>	0.7092803
<i>Umbria</i>	0.7177563
<i>Molise</i>	0.7207428
<u>Val d'Aosta</u>	0.7220888
<i>Abruzzo</i>	0.7247946
<i>Sardinia</i>	0.7831429
<u>Liguria</u>	0.7905764
<i>Campania</i>	0.7951838
<i>Sicily</i>	0.8195677
<i>Puglia</i>	0.8405187
<i>Calabria</i>	0.8835597

A similar procedure has been used to define propensities to import from abroad and from other regions and to define indirect and direct tax rates (the last including payrolls). The results of import propensities are the mirror image of the propensity to consume. Northern regions tend to import more, especially from abroad, while southern regions tend to be more “self-contained”. The results on indirect and direct tax rates do not show such a clear cut between the North and South of Italy and the variance is less.

Individual propensities were used to calculate regional multipliers via equation 4 and the results are shown in Table 2<sup>15</sup>, where the regions are ordered, according to the official classification used by Istat, from North to South.

<sup>15</sup> With the exceptions of Lombardy and Calabria, it is interesting to notice how our results are generally in line with the Anglo-Saxon literature, which found that the values of regional multipliers in the U.K. lie within the range 1.19 to 1.54 the highest value being in Scotland, which is the most peripheral region (the national value is 1.46), see Brownrigg 1971.

Table 2: Regional multipliers calculated by using MPM

Piedmont	1.0027
Val d'Aosta	1.0583
Lombardy	0.9020
Trentino A. A.	1.2250
Veneto	1.0195
Friuli V. G.	1.1205
Liguria	1.3087
Emilia R.	1.1047
Tuscany	1.1064
Umbria	1.2975
Marche	1.2481
Lazio	1.2158
Abruzzo	1.2140
Molise	1.4166
Campania	1.4610
Puglia	1.5686
Basilicata	1.4520
Calabria	1.9459
Sicily	1.4193
Sardinia	1.3384

The national value, calculated by the same method, is 1.58, which is higher than all the regional multipliers with only the exception of Calabria. This is because in the national multiplier the propensity to import from other regions is set to zero by definition and this automatically increases the value of the final multiplier. The case of Calabria is exceptional, in the sense that a very high propensity to consume combined with a very low propensity to import generates an extraordinarily high regional multiplier value<sup>16</sup>.

#### 4.2 The "Aggregate leakages method" (ALM)

The second method, ALM, is easier to compute and allows us to test the robustness of the results obtained with MPM.

To apply ALM we computed the following four leakages: payment of taxes (both direct and indirect), imports from abroad, imports from other regions and savings. We then added all the leakages together to find the total percentage of leakages on regional GDP. Under the assumption that import and saving marginal propensities together with the marginal tax rate do not diverge significantly from their corresponding average values, we can then calculate the values of multipliers simply by finding the inverse of the percentage of leakages. The final results are shown in the Table 3 where the regions are ordered, according to the official classification used by Istat, from North to South.

<sup>16</sup> The case of Calabria is not new. Our results are in line with Casini and Marangoni (1999) who, applying a Leontief-Keynesian technique, found that Calabria is the Italian region with the highest multiplier, 1.625, compared to a national value of 1.482.



Table 3: The multipliers according to ALM - data 1996 in millions Euros

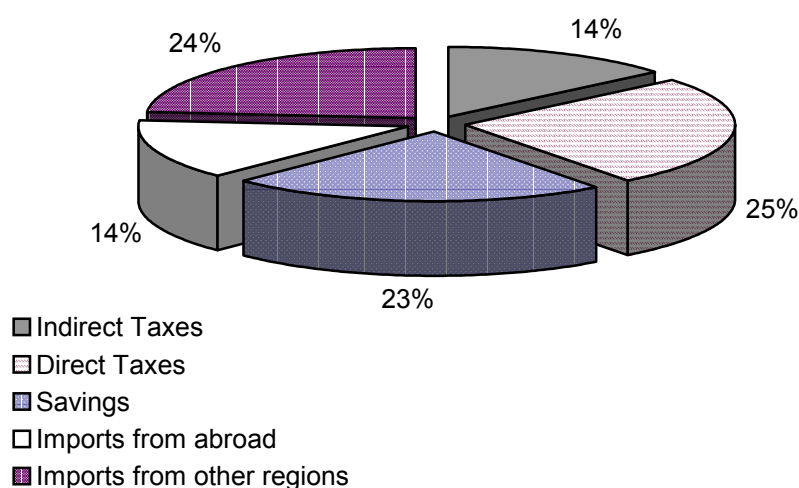
Region	Total Leakages	GDP 1996	Multiplier
Piedmont	77,204.2	85,486.6	1.1072
Val d'Aosta	2,340.2	2,826.6	1.2078
Lombardy	197,650.2	202,861.9	1.0263
Trentino Alto Adige	16,733.7	21,229.2	1.2678
Veneto	79,999.7	89,849.5	1.1231
Friuli Venezia Giulia	19,165.9	23,325.9	1.2170
Liguria	23,227.1	29,932.1	1.2886
Emilia Romagna	68,516.6	86,491.7	1.2623
Tuscany	55,410.7	66,053.4	1.1920
Umbria	10,053.0	13,598.4	1.3526
Marche	18,551.9	25,201.8	1.3584
Lazio	77,906.9	97,862.7	1.2561
Abruzzo	14,739.9	18,687.6	1.2678
Molise	3,110.1	4,411.3	1.4183
Campania	42,143.2	62,026.6	1.4718
Puglia	30,460.2	45,943.7	1.5083
Basilicata	4,844.7	7,202.0	1.4865
Calabria	13,125.5	21,169.5	1.6128
Sicily	41,687.9	56,717.0	1.3605
Sardinia	16,583.0	20,968.2	1.2644

Source: Our elaboration

The national multiplier calculated by this second method is 1.5705, again, as before, higher than all the regional ones except Calabria's (1.6128).

Figure 1 shows the composition of total leakages. The main leakage is due to direct taxes (25%), followed by interregional imports and savings, which account for 24% and 23% respectively.

Figure 1: Composition of total leakages



Comparing the results of the two methodologies the first striking result is that the ranking of regions does not vary much and demonstrates the existence of a gap between the Northern and Southern regions. Some regions in the South, like Puglia and Calabria, have extraordinarily high values of the multiplier compared to the Northern regions. Another unexpected result is that the minimum value is recorded in Lombardy, which is the wealthiest part of the country. Its multiplier is just little more than the unity with the ALM and even below the unity with MPM. This result is due to the very low relative propensity to consume of Lombardy combined with a high propensity to import. Five of the eight regions located in the North of Italy are in the first six positions of the ranking (with Lombardy, Piedmont and Veneto being respectively first, second and third in both rankings). The last six positions of the rankings are, on the contrary, occupied by Southern regions (Puglia and Calabria being the last two in both rankings). The absolute values of the multipliers do not differ greatly, except for the case of Calabria, whose multipliers calculated by using MPM is 1.94 compared to 1.61 with ALM.

The next sub-section we provide possible interpretations of the results achieved.

## 5. POSSIBLE INTERPRETATIONS OF THE MULTIPLIERS VALUES

As almost everyone knows, the Italian economy is characterised by a dichotomy between the prosperous and more developed Northern part and the poorer, less developed Southern part<sup>17</sup>. The interpretations which can be provided for what concerns the estimate of multipliers are strongly related to the structural differences of the economy in the North and in the South of the country for what concerns:

- *the degree of openness of the local economy;*
- *the availability of resources and their marginal productivity;*
- *the level of wealth, income distribution and the consequent different consumption patterns.*

### 5.1 The degree of openness of the Italian regions

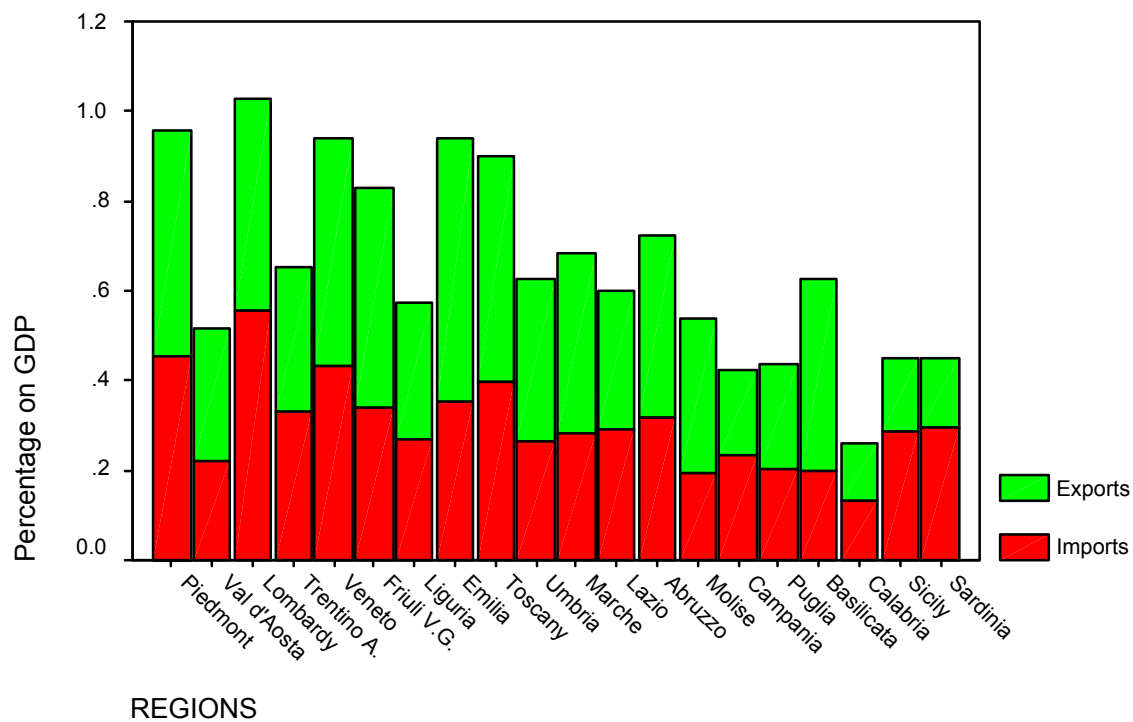
A long-standing hypothesis advanced to explain these disparities between the Italian regions, has been the relative isolation of the South of Italy from the rest of the world. On the other side, the Northern regions benefit from a very favourable position, which fosters international trade. One of the possible explanations for the pattern of values of regional multipliers we have found can be, therefore, the greater degree of isolation of the South. Its peripheral position acts as a sort of “trade barrier” and makes the system more self-contained. There exists, indeed, a negative correlation between location in a Southern region and the level of per-capita exports and imports both from abroad and from other regions<sup>18</sup>. The result is that any injection of money into the system is less likely to leak from the region to abroad. This should imply that the more open the region is to international trade, the lower the multiplier. It is possible to choose from a very wide range of proxies for the openness of a region and one of these can for instance be the percentage of imports and exports (both international and interregional) on regional GDP. In Figures 2 we can see these percentages in the different regions.

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<sup>17</sup> In this respect see for instance Paci and Saba (1997)

<sup>18</sup>The Pearson correlation indexes between a Southern location and, respectively, the level of per-capita imports from abroad, imports from other regions and per-capita exports from abroad are all significant at a level of .05. The only variable, which does not seem to be so strongly correlated to the location in the South is the level of per-capita exports from other regions, which is quite reasonable, since it is very convenient for the other Italian regions, especially the closest ones, to exploit the cheaper relative prices of the South.

Figure 2: Percentage of total imports and exports on regional GDP



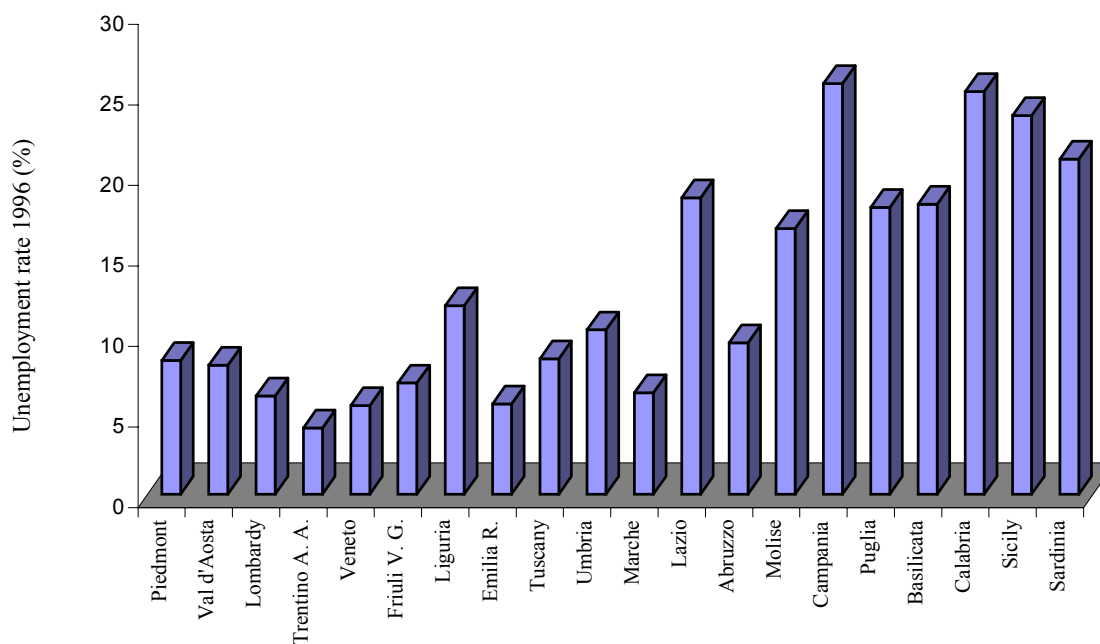
Source: Our elaboration on Irpet and Tagliacarne data

Again we can observe that regions in the South of Italy have smaller values compared to regions in the Centre and especially in the North. Calabria, which is, as we have already said, the region with the highest multiplier, is not surprisingly also the one with the lowest percentage of imports (13.44%) and exports (12.64%) on GDP. On the contrary Lombardy, which has the lowest multiplier value, seems to be very open to trade with a percentage of 55.40%, as far as imports on GDP are concerned, and 47.25% with regard to exports.

### 5.2 The availability of resources

Another possible explanation for the higher figures of multipliers for the Southern regions can be the extraordinary number of unemployed resources in the South. The level of unemployment in the South of Italy is extremely high (Figure 3). In a situation a long way from full employment, it is reasonable to expect that any injection of extra money triggers a faster chain reaction. As we get closer and closer to a full employment situation it seems sensible, on the other hand, that new investment does not have such a big impact on the local economy. If we accept this hypothesis, the larger values of multipliers in the South would imply that public expenditure in this area should be encouraged, because any additional Euro has a greater power to increase income in the South than in the North.

Figure 3: Unemployment rates in the Italian regions



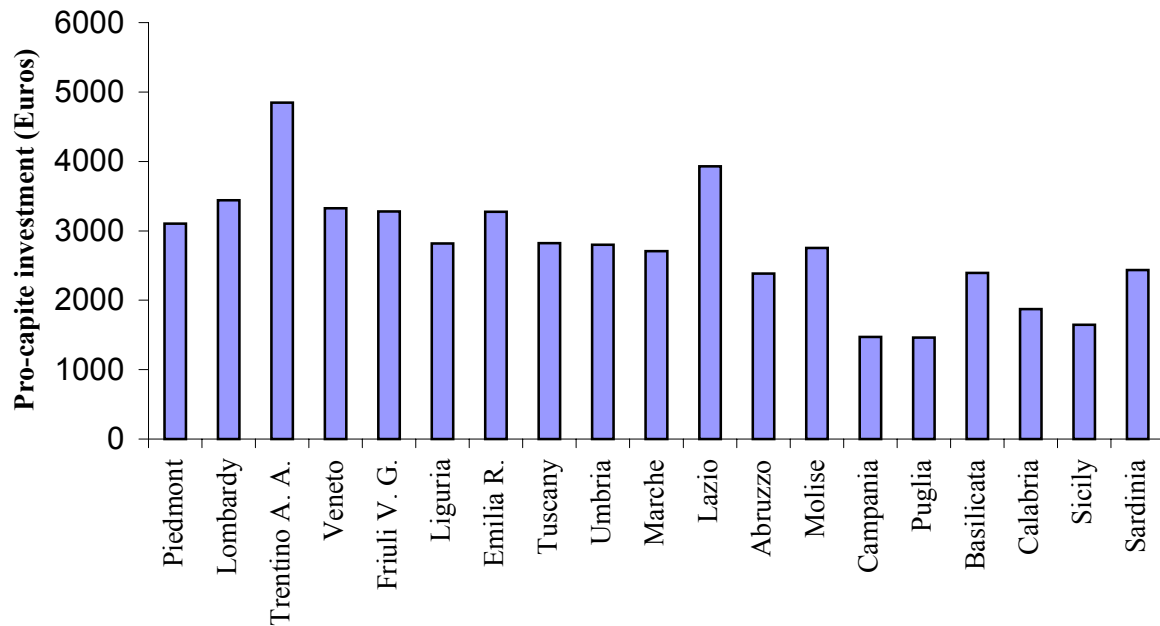
Source: Elaboration on Istat data

The relatively low rate of unemployment of the North-Centre of Italy, 7.1%, is in contrast with the 21.9% of the South.

The same conclusion can be inferred by observing the investments pattern. Figure 4 shows the levels of per-capita investments in the Italian regions. As we can see the level drops in the South and in some cases, like Campania, Puglia, Calabria and Sicily, the level is amazingly low. This seems to confirm the necessity for new projects and activities in these regions, which still suffer from a lack of productive investments.

There is a sort of law of “decreasing returns on investments”, according to which it seems that a new injection of money in the South, where the general level of investments is much lower, produces wider local effects than in the North. The fact that the effects are more localised is also due, of course, to the higher degree of isolation of the South as mentioned before.

Figure 4: Level of per-capita investment in the Italian regions

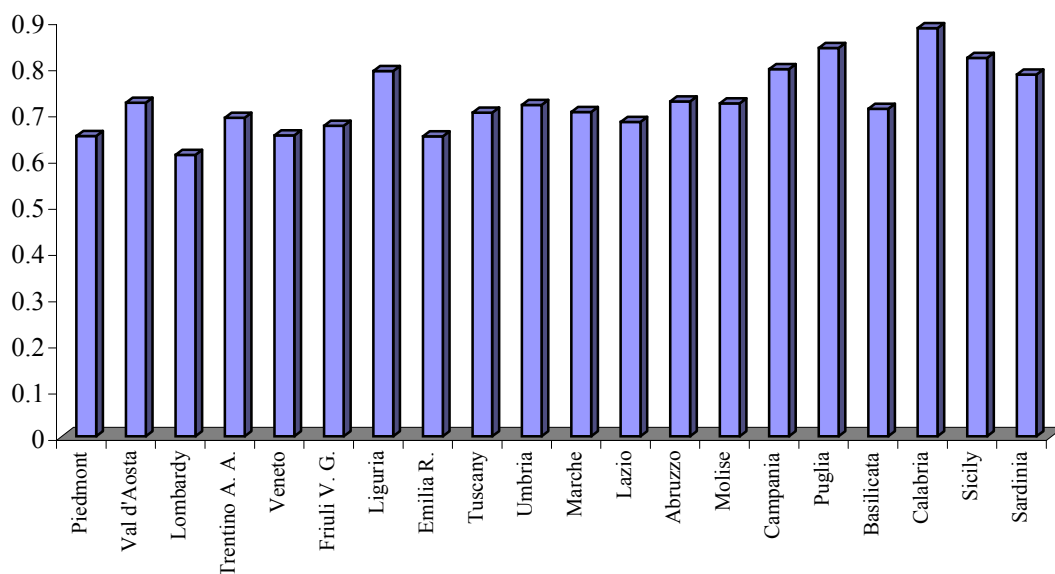


Source: Istat data, 1998

### 5.3 Income distribution and consumption patterns

The last thing worth noticing about these values of regional multipliers is that the average propensity to consume in the South is much higher than in the North and this affects the results. The values of the average propensity to consume are shown in Figure 5, where the regions, as usual, have been sorted from North to South.

Figure 5: Regional average propensity to consume



Source: Our elaboration on Istat data

The high propensity to consume is partly due to the very low per-capita income level of the Southern regions. In some really poor parts of the country the average level of per-capita income is just a little bit higher than the pure subsistence level, therefore, almost all of the income is spent on consumption of food and basic goods. Indeed, Calabria, which is the region with the highest propensity to consume, is at the same time the region with the lowest level of per-capita income, 9358 Euros<sup>19</sup>. Regional propensities to consume and regional per-capita incomes are strongly related inversely and their relation is highly significant<sup>20</sup>.

The very high average propensity of the Southern regions to consume, therefore, seems to give reasons for high values of their multipliers.

#### 5.4 *The role of regional size*

Finally, we have to emphasise the fact that we expected the size of multipliers to be related to the size of the region, both in terms of total surface and the size of its population. It is a common belief among economists that small regions present more open systems than the very big ones because they are less dependent on others as far as production is concerned. Moreover, smaller regions are usually specialised in some particular niches in the market to exploit competitive advantages; therefore they should be highly dependent on imports for a lot of commodities. This does not seem to work for the Italian regions. The size of multipliers is not correlated to both the physical size and the population of regions<sup>21</sup>. However, this is not a completely new result. As Sinclair and Suthcliffe (1977b) point out some British authors<sup>22</sup> found that the same results hold in the U.K. case.

One of the possible reasons for this is the fact that in the South of Italy people tend to spend a greater part of their incomes to buy very basic goods, such as food, housing or personal services, which are provided by the local market. This reminds us of Engel's law, which says that as income increases, people spend a smaller proportion of their total income on food

*"... je ärmer eine Familie ist, einen desto grösseren Antheil von der Gesamtausgabe muss zur Beschaffung der Nahrung aufgewendet werden ..." (Ernst Engel 1857).*

As Gershuny (1985) well pointed out there is "*a psychological hypothesis*" beneath this empirical observation, that is "*the hierarchy of needs, individuals strive first to achieve the fundamentals of physical security and nutrition, and only subsequently to achieve the less fundamentals requirements for comfort, association and amusement*" (p. 128).

Our expectations are confirmed by the data. In Figure 6 we can see that the Southern regions spend a larger percentage of their income on food, which is more likely to be produced locally and therefore to increase the value of multipliers. Very advanced services and sophisticated goods, which cannot be found locally, are only a small part of total expenditure. On top of this, the presence of fewer industries reduces the value of some "classic import goods" like oil, which absorb a lot of resources in the more industrialised northern part.

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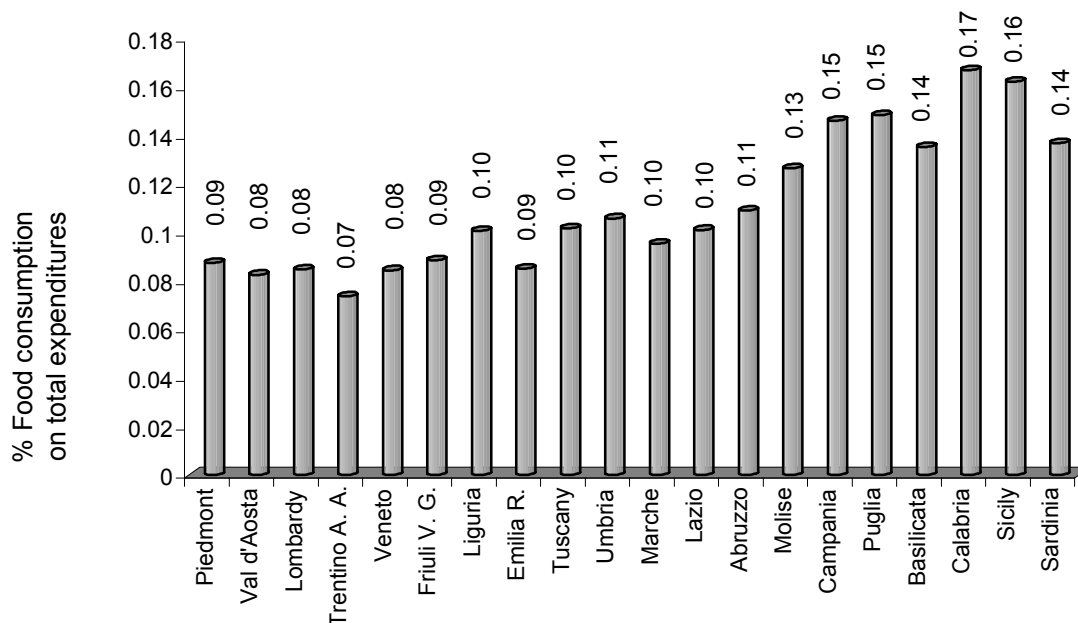
<sup>19</sup> The average level of per-capita income in Italy is a little bit more than 16526 Euros. This means that in the South the average per capita income is about 56% of the national average, which is an extremely low level. If we then add that Emilia Romagna, which is the richest region as far as per-capita income is concerned, has an average per-capita income of 21642 Euros, we can easily understand the reason for the big difference in the values of propensities to consume.

<sup>20</sup> The Pearson correlation index has a value of -.863, significant at a level of 0.01.

<sup>21</sup> If we measure the size of a region in terms of workers or GDP, this result, however, changes. Both types of multipliers are negatively related to both workers and GDP.

<sup>22</sup> Among them Archibald (1967), Capstick (1972) and Henderson and Cousins (1975)

Figure 6: Engel's law applied to Italian regions



Source: Our elaboration on Istat data, 1998

The percentage of food expenditure on total expenditure is much higher in the South. On average people in Italy spend about 10.4% on food consumption, but the average value in the Southern regions is 14.5%, while in the North the value of 8.5% is much below the national average.

In the light of our results and having briefly described the Italian economic system, a new way of interpreting regional multipliers seems to have become clear. The higher the value of regional multipliers, the poorer the region we are considering and vice-versa. This seems a peculiar result and is not what one would expect in the first instance, but a more in-depth consideration reveals that this is not so strange. The size of multipliers, on its own, does not represent proof of the strength of the economy. In the Italian case, on the contrary, they become a sort of measure of the isolation and non-integration of a region in the national and world economy. Although Lombardy is far more prosperous than any other region in the South its multiplier is the lowest. In part this is due to the basic simplifying assumptions and to the fact that we are depicting just a macro situation of the region, but there is something more. Despite the limits of this approach the results tell us something useful, though unexpected. Very prosperous regions produce a lot of wealth, but a higher percentage of this wealth flows to other regions or countries. We used to say that the smaller the system taken into consideration is, the more open it is to the outside. However, there are some further mechanisms, which counter-balance this phenomenon. Size is only a part of the story. Location, for instance, is another very important aspect. In the Italian case bigger and richer regions are located in the North along the border and this fosters their integration with other countries. Moreover, all the northern regions also tend to be much more interconnected amongst themselves. They can benefit from mutual positive spillovers. Another aspect is, as we have already underlined, the difference between consumption patterns. More advanced services and high value-added goods are usually produced in some particular specialised places. It is, therefore, much more likely that people living in richer regions, who can afford to spend part of their income on these refined goods and services, have to import them from abroad. On the contrary, indispensable low value added articles can be produced almost anywhere. They do not require advanced skills and they can be spread all over the territory, because there is no need for them to exploit particular economies of

scale. Poorer regions tend to spend more on locally produced items and this makes them even less integrated. A high multiplier becomes a sort of index, which gives evidence for the potential presence of all these mechanisms. From this point of view we should not be very concerned about the fact that northern regions have very low multipliers compared to the rest of Italy. This does not mean that it is not worth investing money in the north, but only that it is less probable that the effects of a project will remain in the same region where the project was actually undertaken. The spillover effects are likely to be important because of the higher degree of globalisation of the system. If we could take into account these spillovers from other regions probably the values of multipliers in the northern regions would be much higher than the ones we have found.

Moreover, the approach we are discussing is not only macro-economic, it is also a short-run period one. We cannot use the multipliers to forecast long-run effects. In the calculation of multipliers a big role is played by the propensity to consume. A high propensity to consume makes the value of the multiplier higher, but what about the effect of new investments on future development? One of the reasons for poverty in Southern Italy is the lack of investments designed to improve the performance of these regions in the long run. If we want to include the consideration of this aspect we should integrate the theory of multipliers with the accelerator. The higher value of investments in the North of Italy is a clear signal of the vitality and strength of the economy, but turns out to be one of the causes of the low value of multipliers. This does not mean that the multipliers are useless, but only that they must be given the right interpretation according to the specific context we referred to.

## 6. POLICY IMPLICATIONS AND CONCLUSIONS

*“The aim of regional policy is the attainment of a more efficient and/or equitable interregional distribution of economic activity”* (Temple, 1994). Following this definition, it is obvious to question how the results presented in the previous section can be useful in implementing suitable regional policies.

As demonstrated earlier interregional disparities in Italy are quite evident and, as Paci and Pigliaru (1998) point out, they have been shown to be "remarkably persistent" over time. In the last twenty years the value of the average per-capita income in the South has constantly been between 55% and 60% of the corresponding value in the North-Centre. The South still remains one of the most backward parts of Italy.

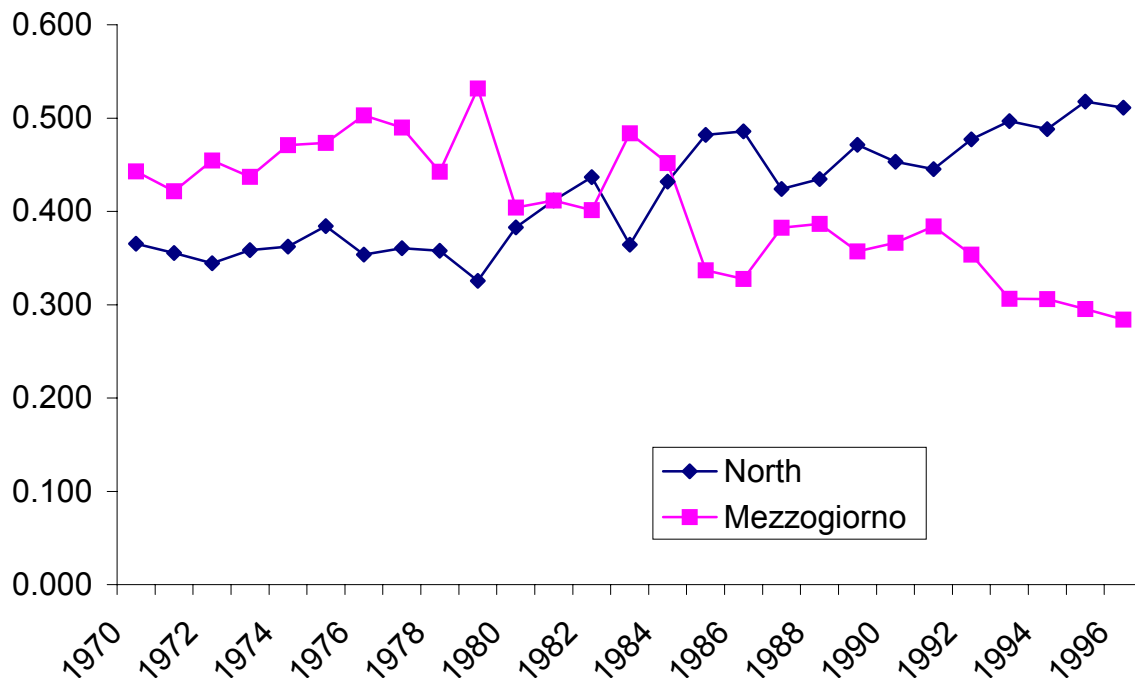
However, as many studies have found<sup>23</sup>, a limited convergence process among Italian regions occurred between 1951 and 1975 (both in terms of per capita income and labour productivity), but starting from the 80s, the gap between the northern and the southern regions started widening again. If we look at public expenditure in the same period, a similar trend can be observed. During the 50s and 60s an intense process of investment in the South of Italy was undertaken. Paci and Saggi (2002) show that in the 60s 39% of national public expenditure was invested in the South compared to 32% in the North and 28% in the Centre. Starting from the 80s public intervention became less favourable to Mezzogiorno. This process continued in the following years with the quota of the North increasing over time and that of the South decreasing. In 1996 the percentage of national public expenditure devoted to the South was only 28% compared to 51% in the North. (see Figure 7).

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<sup>23</sup> See for instance Di Liberto (1994), Paci and Pigliaru (1995 and 1998), Aiello and Scoppa (1999).



Figure 7: Public intervention in the North and in the South of Italy, 1970-1996



Source: Our elaboration using CRENoS data

This seems to testify that public expenditure did play a role in the convergence process, although the picture gets more complicated after the introduction, from 1989, of the European Union Structural Funds. All the seven southern regions qualified for the Objective 1 funds designed to improve infrastructures and support business and tourism, agriculture and investment in human capital. Extensive literature, however, proves that the effect of these funds has been negligible when not intangible (see Rodriguez-Pose and Fratesi, 2002).

As usual it is very difficult to assess the efficiency of policies because we do not know how things would have evolved without any intervention by the State, but it is very likely that the socio-economic gap between southern and Centre-North Italy would have widened even more.

The high value of multipliers in Southern regions means that an increase in autonomous aggregate demand, due to public expenditures, can play an important role in ameliorating the situation. This provides a theoretical justification for the intervention of Government both with direct public expenditure and incentives to promote private investment in these areas. As Casini and Martellato (1995) highlight “*fiscal policies are able to induce significant effects on the relative performance of single regions*”.

Many problems, however, are still open. First it is necessary to understand why public intervention has sometimes been a failure and which part of the productive structure should be the favourite target for regional policies. Especially during the period of the “Cassa del Mezzogiorno” the Keynesian ideas were followed slavishly and this attracted many criticisms. The solution does not seem to reduce or completely suspend the investments in the South, arguing that they are not effective at all, but rather trying to implement policies more appropriate to the needs and industrial vocation of the local economy. It is fundamental for the government to analyse the production structure of the weaker regions before intervening in promoting their development, in order to

promote activities which can find “fertile soil” in the South. Casini Benvenuti and Marangoni (1999), for instance, highlight the importance of a policy oriented towards the increase of investments in infrastructures and construction. The latter, in particular, being considered a "strategic sector" which employs many workers and is highly interconnected with the other industries.

In conclusion, despite the fact that many regional economists advocate the obsolescence of the concept of regional Keynesian multipliers, we contend that they can still provide useful information to analyse the macro-characteristics of regions. Therefore, they should not be completely abandoned and labelled as an “outmoded” concept. Although a couple of our values for the multipliers of the Italian regions may appear a little peculiar, most of them are consistent with our expectations. With further research, it should be possible to overcome some, if not all, of the limitations underlined in the previous sections. For instance, the role of investments can be taken into account by combining the accelerator hypothesis with that of the multiplier. Furthermore, the analysis of indirect taxes could be refined by considering their role with respect to imports.

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