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Regional Policy from a Supra-Regional Perspective

(VERY PRELIMINARY DRAFT, PLEASE DO NOT CITE)

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Abstract

A large number of economic models has been developed in the past 15 years in order to explore the causes of endogenous regional growth and the location of economic activities with the consequent differentials of development among territories. At the same time regional policies have undergone major modifications with increasing importance attributed to bottom up policies and to the efficiency of spending, also due to a situation in which funds are a scarce resource. These developments appear however to have taken place without paying enough attention to the concurrent effects entailed by policies implemented separately by different regions. In fact competing regions can implement policies which are not optimal from an aggregate point of view. At the same time national policies designed to reduce regional inequalities may also be sub-optimal from a country perspective. Unfortunately, it is too often unclear under what values of the parameters regional policies are also able to increase the aggregate economic performance of nations or over-national communities and which policies are, instead, to be simply considered as a means to increase the equality of income across space. Therefore it is on the one hand important to detect which regional policies belong to each of the two categories, then to compare them with different policies (aiming at equality of income or at efficiency) to discover which ones are better suited to achieve the needed results with lower costs. On the other hand, it is important to further investigate which policies are more fruitful if implemented in a context of regional competition and which ones should be top-down. This article addresses the issues presented above. First there is a revision of the existing contributions in order to evidence the general tendencies of the existing literature, the results that can already be considered as achieved and the deficiencies that limit the ability to produce usable policy prescriptions. Then the paper analyses the relationship between regional policies and national competitiveness in a small number of selected

existing models of regional growth and localisation, in particular with an extension to the case of competing countries, each composed of more than one region.

1 Introduction

"In the past, the consensus was that regional policy could support growth, and that convergence would come about by poorer regions catching up with richer ones. Increased equality and growth could go hand in hand. Recent experience has led a number of commentators to question this. They argue that there are strong economic forces that lead to divergence between regions. Regional policy cannot do much to overcome these forces. This means that regional spending is simply a transfer of income from rich to the poor - with little effect on productivity gap in poor regions. Indeed, this may led to lower overall prosperity if it drains resources from those wealthy innovative regions that are the main engines of economic growth. If this is the case we face a trade off between equality and growth", (Maystadt, 2000, p.4).

As well emphasised by the president of the European Investment Bank, regional policy faces a radical challenge in front of the evidence and theories put forth by the renewed interest paid to spatial aspects by economic theory: mainstream economists have re-entered the field from more than a decade and have added their insights to the recent developments of geographers and economic geographers so that now a large number of approaches is now available to study the effects of regional policies.

At the same time, the instruments of regional policy have deeply changed and involve a wider range of policies, with larger importance devoted to the context, to programming and evaluation, and to indirect effect which could harm the results to be achieved. Even more important, a large part of regional policy now employs a bottom-up approach, in terms of decision process, management, financing and evaluation. This introduces an additional difficulty to economic modelling, which is at present only partially overcome with the aid of new techniques.

As the paper will evidence, most economic literature still thinks about regional policy in terms of infrastructural policy, or even more specifically, in terms of mere transport infrastructure, which used to constitute the bunch of many interventions until the 80s, but which already had a large number of exceptions, like for example the policies inspired by the Perroux's Growth Poles theory (Darwent, 1969). The focus on infrastructure, is mainly due to the difficulty of modelling complex territorial aspects, especially those relational, but, in some cases, one could also conjecture a simplified understanding of regional policies; most economists, however, are now aware of the large work that remains to be done in the field, for example Baldwin et al. (2003).

The scarcity of available resources, due to tighter financial constraints, is making more important the analysis of the effects of regional policies on the overall efficiency of the economic system since it becomes of paramount importance to know if new resources become available (as in the traditional approach that used to see regional policies as development policies) or if there is a price in terms of efficiency, or aggregate income, to be paid in favour of an increased equity between regions.

2   On the concept of Infrastructure

As already mentioned, most models focus on infrastructure but the concept is broad and no definition is available which may be used for all purposes: according to Biehl (1991)[p. 9] it is defined as "that part of overall stock of national or regional economies that, because of their 'publicness', are normally not provided by free market at all, or only inefficiently"; his focus is therefore on infrastructure as capital stock and as public (or nearly public)

good. This definition cannot always be applied, since the 90's have experienced an increasing interest in the private provision of public infrastructure as a instrument to obtain economic efficiency.

Gramlich (1994)[page 1177] affirms that "The definition that makes most sense from an economic standpoints consists of large capital intensive natural monopolies such as highways [...] most of these systems are owned publicly in the United States but some are owned privately" but he admits the possibility of alternative, broader, narrower definitions; this though focuses on the natural monopoly (in general due to to economies of scale) instead of on the public good that is "nondepletable" (Mas-Colell et al., 1995, p. 359) meaning that this use by an agent does not preclude the use by another agent. Biehl (1991), particularly, extend the 'publicness' from the mere non excludability (that can be due either to the impossibility of defining property rights or to the fact that in practice, the mechanisms necessary to obtain the exclusion are too costly) to include: non-substitutability, i.e. the infrastructure cannot be replaced at a low cost by another; immobility, i.e. it cannot be moved or if it can, it is at a prohibitive cost; polyvalence, i.e. it may be used as a production factor in many different economic processes; indivisibility. The last feature, the fact that infrastructure can usually be built only for a determined carrying capacity and this independently of how much of the maximum capacity will be actually utilised, can be somewhat referred to scale economies and is the reason why many communication projects are economically worthwhile only in the already advanced regions and do not pay off in less developed.

Whatever the case, the definition is debatable and Button (1998), after having recognized the importance of and the difficulty of achieving a good definition, adopts the way out of treating it as "what most people consider

it to be" (p. 150).

The result of infrastructure investment has been econometrically calculated by a number of studies following the seminal work of Aschauer (1989) that, using a Cobb Douglas production function, estimated the effects on aggregate productivity in the US of a number of different types of public capital and found that the largest explanatory power is displayed by a core composed of streets, highways, airports, mass transit, sewers, water systems. The value that he finds is very high, enough to make the public provision of these factors able to increase aggregate output by more than their value and this led to many criticisms , but other successive studies also find high values and the merit of Aschauer, beyond the value of the estimated parameters, was to call attention to the fact that public capital has indeed and effect on productivity.

Traditionally, infrastructure plays two roles in economic models and empirical analysis at a local level: first it increases productivity and second it influences competitiveness and, as a consequence, the location of industries; both these effects were supposed to be exerted in a linear and growing relation, but new evidence and new theories, developed in the last decade, now question the linearity of this relationship. In fact, the infrastructure issue involves a number of complications that make its analysis complex.

Following Hackfoort (1996), there are three approaches towards infrastructure in the empiric literature: the first is the production function, in which the infrastructure enters as a factor along with labour and private capital; the second is the profit function approach, in which what is calculated is the influence of infrastructure on the firms' profits; the third is the cost function that attempts to measure the impact of infrastructure on the costs of producers; because of the microeconomic property of duality, the

two last should give, in theory, the same results. The effect of infrastructure on costs depends on the nature of its relationship with the other production factors: if it is of substitutability it always reduces costs but if there are complementarities the effect is undetermined.

Wickerman (1991b) (p. 37) stresses that "although transport, like any other infrastructure, is clearly associated with economic growth [...] it is not unambiguously the promoter of such a growth". It is in fact possible to think of infrastructure as a "facilitator" which makes possible to accomplish some economic tasks but does not guarantee that the tasks will actually be accomplished.

3   Desired properties of regional policies

With the introduction of models with imperfect competition (Dixit and Stiglitz, 1977) and consequent agglomeration (Krugman, 1991a,b, Ottaviano and Puga, 1998, Fujita et al., 1999, Neary, 2001, Fujita and Thisse, 2002) first the linearity of the relationship between transport costs and regional development has been questioned, then, as a consequence, the linearity of regional development, since an increased attention have been devoted to issues such as history, the lock-in and expectations (Ottaviano, 1999, 2001, Baldwin, 2001). It is interesting to remember that, in models with multiple equilibria, a force that pulls the economy out of an unstable equilibrium cannot be counterbalanced by an opposite force of the same size, this because of cumulative effects that move the system towards the stable equilibrium (or one of the stable equilibria when there exist more than one).

We can represent the possible outcomes of multi-regional models of agglomeration in a 4 quadrants graph (Fig. 1). We will have horizontally growth

EQUILIBRIA OF MODELS		Regional Disparities	
		High	Low
Growth / Income	High	**II**	**I** (Best situation)
	Low	**III** (Worst situation)	**IV**

Figure 1: Classification of equilibria of the models.

or income (depending if the model is dynamic or static), measured for the whole country; vertically there is represented the extent of regional disparities. Both axes should actually be depicted on a continuous scale, but in the discreet form it is easier to discuss its meaning.

When decreasing returns are present, like in exogenous growth models (Solow, 1956) or in traditional location models, the maximum income is achieved in a dispersed equilibrium, the same one that we indicated in quadrant **I** as "Best situation", since it is optimal from a Paretian point of view.

When increasing returns are present, on the contrary, a number of models, especially of the New Economic Geography (NEG, the most relevant for our purposes of those will be mentioned in the next section) have outlined that the equilibrium is more likely to be one with concurrent high income/growth and high agglomeration, even if for some values of the parameters it is generally possible to have situations of high income/growth and low agglomeration, or, and this is the worst case, situations in which regional disparities are high despite of a low income/growth. For example Ottaviano and Thisse (2002)

EFFECTS OF REGIONAL POLICIES		Regional Disparities		
		Increase	No effect	Decrease
Growth / Income	Increase	**III** (policies targeting efficiency at detriment of equity)	**II** (policies targeting efficiency)	**I** (policies targeting both equity and efficiency)
	No effect	**IV** (damaging policies)	Ineffective Policies	**VIII** (policies targeting equity)
	Decrease	**V** (damaging policies)	**VI** (damaging policies)	**VII** (policies targeting equity at detriment of efficiency)

Figure 2: Classification of the possible effects of regional policies.

have identified a case of market failure in which, for intermediate transport costs, the market outcome is the one of agglomeration, even if from a social point of view dispersion would be desirable.

The theoretical developments of the last 15 years, therefore, have somewhat reversed the pattern of the most reasonable theoretical relationships between growth and agglomeration, from one which saw the **I** and **III** quadrants as the most likely to occur to one in which the relationship is not linear and it is also probable to find the economy in the quadrants **II** and **IV**. We would like to notice that the quadrants **II** and **IV** are not comparable from a Paretian point of view, and this poses another problem to the policy maker, who, when allowed to pick up an equilibrium, may be facing a trade-off between two desirable objectives.

The next step is therefore to build a 3 by 3 matrix in which to classify regional policies (Fig. 2) according to their effects on regional disparities and on the efficiency of the aggregate economic system. Although 9 situations are

theoretically possible, only 5 of them are indeed logical choices for the policy maker. In fact, policies which have no effect are not worthwhile, especially when costly, and only a malevolent planner could chose to apply policies whose effects can be classified in quadrants **IV**, **V** and **VI**. Unfortunately, even if not designed with that purpose, it is possible that, once implemented, some policies have detrimental effects, but this has to be considered an unintentional effect and will not be discussed further.

The regional policies which can be with some reason implemented by a benevolent planner are those of quadrants **I**, **II**, **III**, **VII** and **VIII**; there may in fact be policies targeting the efficiency of the aggregate system, for example when congestion dis-economies are present, and policies targeting equity in space, either because this is considered a viable way to reduce the differences of income across the population, or because in this way it is possible to foster the "cohesion" within a state or a supra-national body as the EU.

The two objectives may be disjoint (policies belonging to quadrants **II** and **VIII**) or can be targeted simultaneously by just one policy (quadrant **VI**). The latter is the case of the EU Cohesion Policy, which tries to be a mean to increase the cohesion of the Union by reducing regional disparities and to allow a more balanced and, eventually, higher growth, as cited in the 3rd Cohesion Report:

"Strengthening regional competitiveness through well-targeted investment throughout the Union and providing economic opportunities which help people fulfil their capabilities will thus underpin the growth potential of the EU economy as a whole to the common benefit of all. By securing a more balanced spread of economic activity across the Union, regional policy helps to reduce the pressures of over-concentration, congestion and bottlenecks" (Commission, 2004,

p. xxvi-xxvii).

Whether in the past the EU regional policy has been able to achieve these objectives is still matter of an intense debate.

As obvious, the policies of quadrant **I** are the most difficult to implement. This is even more striking since, in presence of externalities, there exists a trade off between growth and spatial dispersion, so that regional policies can even fall into quadrants **III** and **VII**; this is the case of transport infrastructure between regions if the Core-Periphery model is worth: the result is an increased agglomeration, which makes the inhabitants of the core region richer at detriment of the poorer. Policies of types **III** and **VII**, despite of the fact that they are not comparable from a Paretian point of view, can in any case be implemented by a benevolent policy maker, but they need a political decision on which objective is superior to the other and, consequently, a stronger political consensus.

For example, Davies and Hallet (2002) find some evidence of a trade off between national growth and regional dispersion in the case of Spain and Ireland, even if, in non-Cohesion countries, they also find evidence of a spread effect for which the reduction of regional disparities has induced a positive effect on growth.

The literature on trade, moreover, usually finds empirically that, with trade getting freer, there is larger growth but national divergence.

At the same time, Paluzie (2001) showed with a three regional model (two of which domestic) that, if trade becomes freer, regional disparities increase.

Unfortunately, the political deciders are not always aware of the possible drawbacks of the policies they are going to implement. This problem is made even more evident by the fact that the same policy can have very different results if applied to different contexts, and too often the theory is insufficient

to distinguish among them.

One of the criticisms of Martin (1998b) to the New Economic Geography theories resides in the fact that space is overly simplified and lacks of realism, so that, with no insights about the specificity of territory, it is nearly impossible to produce policy prescriptions. In this aspect some work has been accomplished but much work is still needed, as also authors of NEG agree and are trying to extend their models with the purpose of taking into account a deeper description of spatial aspects (Ottaviano and Thisse, 2003).

4 Regional policy in growth, agglomeration and public finance models

The spatial impossibility theorem (Starrett, 1978) affirms that when transport is costly and space is homogenous, then no equilibrium exists that involves the movement of goods. For this reason (Thisse, 2000) when agglomeration exists, this is due to one or more of the following items: heterogenous space; market externalities, either in production or in consumption; some kind of non-competitive markets[1]. The market outcome will be optimal in the first case, but some interventions will be justified in the other two. In particular Thisse (2000), using the model of Ottaviano et al. (2002) shows that for high transport costs the equilibrium is a dispersed pattern and this pattern is efficient; the same happens for low transport costs, when the equi-

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[1]Hurst et al. (2000) identify three main groups of possible market failures: the existence of substantial technological externalities; the presence of pecuniary externalities, which could lead to excessive agglomeration; the presence of a minimum threshold, so that either new businesses need a minimun scale or a lack of adequate information on market and production conditions may prevent new activities from implanting in a new area.

librium and more efficient pattern involves agglomeration. On the contrary, when transport costs take intermediate values, there is more agglomeration than efficient.

The introduction of space, however, can also be used in order to achieve perfect competition in models with increasing returns, as recently shown by Berliant and ben Raa (2004), and this is a further proof that adding the spatial dimension to economic models leads to important complications and, even more important, to results that are highly dependent on the hypotheses.

The shipping of the goods does not constitute all of the transport costs: different customs, an imperfect knowledge of the market, "quality" limits to import, and even the exchange rate risk can be considered together; the Euro, for example, can be thought of as an immaterial infrastructure able to decrease the cost of moving goods across the continent by eliminating the problems due to the use of different currencies.

In many New Economic Geography models, moreover, the effects of local infrastructure are modelled by inserting iceberg transport costs as a wedge between the production price and the consumer price of goods produced and consumed locally.

Martin and Rogers (1995) develop a model of location with public infrastructures capable of leading to two important conclusions: first that there is some circular causation between the provision of infrastructure and agglomeration; in fact a state where there is more production generates more output and consequently tax revenue that can be reinvested in more infrastructures keeping these more advanced than that of a lagging country. This can be also applied to regions if there is some sort of fiscal federalism or if the nation state allocates its resources taking into account the revenue that it gets from the various regions. The second conclusion arising from the model is

that there is a big difference of results between infrastructure that facilitate domestic trade and those that facilitate the international one. The former leads to an increase in efficiency and production of the domestic area; the latter in most cases leads to larger aggregate economic production but also to greater agglomeration at detriment of the less advantaged region. As in generally all the new economic geography models, the space scale is not really specified and so the model can be used between nations at a European level or between regions at a country level.

The model is innovative, but the distinction between these types of transport infrastructures were already known in the literature since Wickerman (1991a) pointed out the distinction between three types: those that use the region as a pure corridor (as it is the case of an high speed railways without stops), those that interconnect the region with other regions and those that improve mobility within the region; the first have in general no direct effects but may have indirect effects, often negative for the region crossed (and, obviously, positive for the terminals of the network); the second's effect is ambiguous (but most models of new economic geography seems to incline to say that in most cases it will favour the agglomerated regions and hamper the lagging ones); the effect of the last are always positive at a regional level, even if they have to be compared with the costs of setting up the infrastructure.

Philippe Martin (1998a, 1999b,a, 2000), following his work of 1995, is the author than most explicitly has addressed the issue of efficiency and equity of regional policies. In the first of these contributions Martin (1998a) he questioned the linearity of the relationship between growth and localisation, and using a model of Martin and Ottaviano (1996, 1999), evidenced the possibility that higher agglomeration and higher growth coincide.
In the second article Martin (1999b), using a model with both growth and

agglomeration, he achieved the conclusions that there exists a trade-off between growth and an even spatial distribution of economic activities, showing that the effects of an increment of infrastructure that ease the commerce of goods within a poor region are: a lower concentration of industries, a lower growth rate and, un-intuitively, an increase in the income gap between the regions. On the opposite, infrastructure that decreases trasport costs between regions increase agglomeration, increase growth and decrease nominal income disparities, but with an ambiguous effect on real disparities since the impact on the price index of the regions is complex. The policies that increase the rate of innovation, finally, have a win-win effect, since they both increase the growth rate and reduce regional disparities.

In the third article Martin (1999a), using the theoretical conclusions of the second, shows that, in the light of the trade off growth-equality, the EU will need to re-define its policy objectives, in particular that market failures have to be identified and have to be the basic target of policies; the paper also supports policies that try to make easier communication and the transfers of innovation across space; the author also supports that with policies that increase the mobility of workers regional income disparities should decrease, a conclusion which is shared by Puga (2002) and Hurst et al. (2000), even if recently (Fratesi and Riggi, 2004) it has been evidenced that the effects of workers' mobility are not necessarily straightforward.

The conclusions about regional policy achieved in the New Economic Geography literature have been with efficacy synthesized in the book of Baldwin et al. (2003), mainly using an extended version of the "localised spillovers" model developed by Martin (1998a, 1999b); the book models as intra-regional and inter-regional trade costs many features which include infrastructure but not only; in this way the authors are able to discuss the effects of a number

of regional policies.

The first policy experiment is a continuous transfer of income from the north to the south[2] which lowers income inequality and spatial concentration, but also lowers the growth rate of the whole country. As already evidenced by the original article (Martin, 1999b) an infrastructure that facilitates intra-regional trade in the south lowers agglomeration, lowers aggregate growth and increases nominal income inequality both between regions and between workers and capital owners. Infrastructure that decreases inter-regional transport costs increases growth and spatial concentration, and decreases nominal income inequalities again both between regions and between workers and capital owners. Policies that facilitate technology spillovers across regional boundaries increase growth in the whole economy, decrease spatial concentration and decrease nominal inequalities between regions and between workers and capital owners.

In the context of a three-regional country they then obtain the interesting result that, if the central region is the poorest, decreasing transport costs lead to a re-location of economic activities towards the central region provided that its share of Expenditure is sufficiently high.

They then introduce congestion costs and show how, in this case, lower transport costs between regions may put the economy in an equilibrium with low growth, high spatial concentration and high regional income inequality, the worst equilibrium of Fig. 1.

Finally, their analysis is extended to show how infrastructure improvements have non linear effects, in particular an improvement of infrastructure within

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[2]Also in this case, as in nearly all two-regional models, the North is used to indicate the advanced (agglomeration) region and the South the lagging one, as it is used in the literature about asymmetric models of trade and growth (Chui et al., 2002).

the poorer region may have no effect at all until a certain threshold is reached and, then, convergence suddenly occurs between the two regions.

Lanaspa and Sanz (2004) further extend the model of Martin and Rogers (1995) in order to consider that infrastructure can have differential effects on imports and exports. They chose to classify a large number of infrastructure (and, hence, of policy interventions) into 4 types, depending if they are domestic or international and if they affect import or export costs; the results they get with the model is that the most effective policy for a region interested in attracting more industry is to improve its domestic and international export infrastructure, whilst the investment in transport or international import infrastructure does not have a clear effect. Concerning welfare, attracting industries always increase welfare, even if at detriment of the other region. Their analysis, in fact, does not focus on general welfare implications.

In a previous contributions, the same authors (Lanaspa et al., 2001) extended the core-periphery model (Krugman, 1991b) to include a public sector, getting the result that regions with a lower tax burden or with an higher efficiency of the public sector are generally more attractive to firms' location; the other effect they observe is that the influence of transport costs becomes dependent on the size of the public sector so that the relationship between these costs and agglomeration is no longer monotonous as in the original C-P model.

An envisaged development regards the analysis of regional policy in models which explicilty intruduce non-traded goods in the economy as in Behrens (2004) who, using and extension of the model by Ottaviano et al. (2002) show that more complex spatial structures emerge, in particular that partial agglomeration is possible. Other interesting aspects to investigate are the scope

and effects of regional policy in models which introduce taste heterogeneities in the line of probabilistic migration theories, like the one of Murata (2003), or in models that introduce asymmetries in the regions, such as Lanaspa and Sanz (1999) who use different agricultural populations in the C-P model as a proxy of heterogeneous quality of land, or in models in which congestion is possible (Lanaspa and Sanz, 2001).

Ottaviano (2003) lists the general policy implications of New Economic Geography models: first all policies (tax, competition, trade, etc.) usually have spatial effects, and these effects should be taken into account; second, the impact of regional policies is highly dependent on the extent of trade integration, in general the effect is more important when barriers are lower and goods and capital are more footloose; third there exist threshold effects, since policies can have no effect until a threshold is reached and, then, the effect is catastrophic; on the other side, due to the existence of the lock-in, temporary policies can have permanent effects due to locational hysteresis and self reinforcing mechanisms; finally, policies can be very effective when they act as a selection mechanism able to lead the economic system towards the desirable equilibrium, if the starting point is not a stable equilibrium.

An important theme in regional integration and policy, which is increasingly integrated into agglomeration models, is fiscal competition (see the work of Wildasin (2003) for a recent and encompassing model): regions can compete by decreasing taxes in order to attract firms and, in this way, increase their welfare at the other region's expenses; unfortunately this may lead to a "race to the bottom", and regional authorities end up by decreasing taxes or giving subsidies to firms up to a level which is no longer justifiable in economic terms: this is known as Tiebout mechanism. One way of coming out of this has been identified by Justman et al. (2001) in the regional differ-

entiation of the quality of infrastructure, if there is enough differentiation of firms, so that each region would provide and be paid for a certain quality of infrastructure, which a group of firms chooses as its better compromise and consequent location. Another factor lowering fiscal competition (Bjorvatan and Schjelderup, 2002) is the presence of international spillovers of locally provided public goods, which are unfortunately not able to induce the first best outcome because there is then a problem of free riding among regions. Moreover, they show that congestion can lead to an under-provision of public goods.

Finally, Ludema and Wooton (2000) show that, contrary to the most diffused belief, regional integration can decrease the intensity of tax competition, restoring rather than eroding fiscal autonomy; this happens, in economic geography models, especially when agglomeration forces are high.

In a recent paper, Dupont and Martin (2003) study the effects of a number of subsidies to mobile firms as a form of regional policy, and get an unpleasant conclusion: since it is the core who owns more capital, such subsidies, even if financed at national level and introduced in the poor region, may increase inequality.

5   Regional policy in a two countries four regions model

In this section we will present a model inspired by models of growth with public policy (in the line of Barro (1990), Rebelo (1991), Barro and Sala-i-Martin (1992)) and models of agglomeration, as outlined in the previous section. The model explicitly introduces a 2-country 4-regions framework, with the purpose to investigate in what stages of development regional policies

with productive targets are more appropriate than income transfers across regions.

A previous work with 4 regions, although implicit, was the one of Casella (2002), who, using a model derived from the one of Ciccone and Hall (1996), introduced the possibility of having two countries and two regions not coinciding. The model of Casella, in fact, was inspired by the EU situation, where poor regions tend to be the most peripheral. Her idea, therefore, is to have a core and a periphery, and two countries each of which encompassing part of the core and part of the periphery. She concludes that the optimal policy requires both national and international transfers. The only case in which the single countries policies can achieve efficiency, in fact, is when the mobility of workers if full across borders.

[The model will be presented directly at the conference]

[Insert model and solutions here]

6 Conclusions

The literature survey has evidenced that, despite significant advancements, the introduction of regional policy into models of growth and/or agglomeration still has a long way to do.

In particular, regional policies in economic models are usually analysed for their change in equilibria. This is clearly a limit, since adjustment is viscous, and many interventions act at a point in space where equilibrium has not been reached.

Then, there is the fact that regional policy is costly; for example it is expensive to reduce the transport costs between two regions, due to the large infrastructural investments needed; many authors never explicitly consider the cost of policies, with some exceptions, like Martin (1999b) who states that to have costly policies does not affects the main conclusions of his model.

Another aspect is the fact that nearly all modelled regional policy regards infrastructure (Dupont and Martin, 2003, is an exception) and the fact that infrastructure is most times considered as a mean of exchange of goods, even if in the real world there exist infrastructure for a large number of purposes: helping production, supporting innovation, increasing the skill level of citizens, increasing the amenity level of the region, etc.

The model of section 5 has shown some effects of regional policies in a context of competing countries, each of them made by more than a region. In particular it evidenced that, when infrastructure is a factor of production, there exist stages of development in which the optimal strategy for a country becomes to concentrate the productive capability into one region and give the other region only income transfers.

This has historically happened in a number of cases; a striking example is the one of the Italian Mezzogiorno, where, in the years of economic boom for

the country, the South has gained much more in terms of ability to consume than in productive capability. After the "Autunno Caldo" of 1969 (Boltho et al., 1997) the nominal wages have become more similar across the country and, added to the standing gap in infrastructures and services (Confindustria, 2000) this has contributed to the lack of inward investment.

What is remarkable, though, is that the movements of population from north to south has nearly stopped after the mid-70's, and this despite the huge difference in unemployment rates. Attanasio and Padoa Schioppa (1991) found 5 concurring causes that increase the cost of moving: the fact that women are now in a larger number on the labour market makes it more difficult to relocate because of the need to find 2 jobs instead of one; the differences in the prices of basic facilities, especially housing; labour laws that make very difficult firing and hiring; the aggregate unemployment rate that may affect the gains from migration; lastly, even the fact that after some years of low migration the mobility is more difficult, possibly because of the loosening of ties useful to relocate. In addition to the increasing costs they indicate two other causes for the drop in migration, very relevant fro our purposes: the decrease in interregional real wage differentials and the rise in the government transfers to the south, that allows the so called "wait unemployment" of young people that can rely on familiy support. Faini et al. (1997), however, criticise this last point and find that higher household income make it easier to finance the cost of migration; their favourite explanation is a combination of demographic factors, high mobility costs and a job searching process that in Italy is publicly managed and highly inefficient (even if some reform is under way).

As Lombardini (1992) points out, an efficient industrial policy has never been set up, instead all the policy has been developed in an assistantial

manner and the south has developed only as a big market for the north products. The hoped-for movements of northern entrepreneurs to the south has not occurred in the 50's and 60's, when the labour cost in the south was consistently lower than in the north, because of the lack of reliability of the public administrations in granting basic services, infrastructures and even security from crime. Instead many skilled southerners have moved northwards together with unskilled workforce that has contributed with cheap labour to the "Italian Miracle" of these decades.

Today the GDP of the South is around 54 % of the one of the North but consumption is much more levelled at country level, since the Mezzogiorno is about at 72% of the Northern value.

This development pattern has always been interpreted negatively by all commenters, for example Alesina et al. (1999) measure that half of the public wage bill in the south can be defined as a subsidy, given the size of the public employment and the wage premium for public jobs with respect to private ones. They also find that this form of subsidy has very negative effects since it creates a dependency equilibrium in which private jobs are not attractive and it becomes difficult for an entrepreneur to offer wages competitive with the ones in the public administrations.

Some similarities and some differences exist with East-Germany case: according to Boltho et al. (1997), after re-unification, former DDR has experienced a high raise in nominal wages (from 10 to 70% of West Germany) and transfers, but the outcomes should be different from the Italian case since the wage differential remains consistent enough for competitiveness, the investment rate is very high and, very important, East Germany has a tradition of entrepreneurship (it was the most advanced part of the country before WWII) and prosperity that should avoid it to be entangled in dependency

and rent-seeking behaviours.

Sinn and Westermann (2001), in addition to striking similarities in term of artificially low wage differential, dependency on transfers, locational disadvantages, also find that the level of investment in East-Germany is decreasing, that wages are still higher than productivity and even that "It is impossible to run a market economy where the minimum income guaranteed through the welfare system is equal to the average net-of-tax wage income" (Sinn and Westermann, 2001, p. 23); as a consequence the process of convergence between the two Germanys, substantial until 1996, has halted in 1997. The solution they propose is decentralised wage bargaining, leaner welfare state to avoid the crowding out of the private labour market, transfers through infrastructure investment instead of social support.

Unfortunately we are not able at this stage to assess if one of these cases (for example Italy in the 50's and 60's) has to be considered a case in which giving immediately to the lagging regions an increased spending power has proved more efficient for the whole country than giving it productive infrastructure. However, we cannot a-priori exclude it, even if this issue would deserve an ad hoc analysis, that it is not possible to run in this paper.

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