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The ‘Trade-off’ between Spatial Equity and Economic Efficiency Revisited: Evidence from the US States*

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Abstract

The principle aims of regional policy can be encapsulated in terms of ‘spatial equity’ and ‘economic efficiency’. Establishing the relation between these two aims is of fundamental importance. Conventionally, however, it is assumed that there is a conflict or a ‘trade-off’ between them. In this paper, a hopeful view, i.e. that the two aims are complementary rather than competitive, is put forward. The validity of this view is examined empirically using data for the US States covering the period 1972-2005. The obtained results map an instructive framework for regional policy where the scope for reducing regional inequalities is not incompatible with improvements in economic efficiency.

JEL Classification: R11, R58

Keywords: regional growth, regional policy, spatial equity, trade-off

1. Introduction

Regional economic policies seldom have a single aim. Instead, they represent a range of different aims, which can be classified under two broad categories: ‘equity’ and ‘efficiency’. In this context an intriguing question arises. Is there a conflict or a ‘trade-off’ between ‘spatial equity’ and ‘economic efficiency’? This question seems to be simple and straightforward; the answer less so.

The debate on the aforementioned conflict used to be a popular topic in regional research during the 1970s and the 1980s (e.g. Mera, 1967, 1973, 1975; Stöhr and Tödtling, 1977; Ulltveit-Moe, 2007; Richardson, 1977, 1978; Cole, 1987), which surprisingly enough remained dormant for over two decades. Although, Martin (2008) rekindled interest in this issue, nevertheless, it has so far received limited attention in the contemporary literature on regional economics. In addition, the empirical evidence is still very scarce and remains a virtually unexploited mine of research for regional economists. This paper attempts to shed some light to the long-run relation between ‘spatial equity’ and ‘economic efficiency’. It does so by adopting an empirical approach with reference to the US States over the period 1972-2005.

* The findings, interpretations and conclusions are those entirely of the authors and do not necessarily represent the official position, policies or views of the Ministry of Rural Development and Foods and/or the Greek Government

This paper is organized in the following manner. Section 2 outlines the concept of the ‘trade-off’, as originally put forward. Taking this concept further, it will be argued that it is possible to accomplish simultaneously the aims of ‘equity’ and ‘efficiency’. This argument is submitted to an empirical examination in Section 3. Data related issues are also overviewed in this section. Finally, Section 4 concludes the paper and suggests areas for further research.

2. Economic Efficiency and Spatial Equity: Is there a ‘trade-off’?

A major obstacle to a successful implementation of regional policy is a conflict in its aims or a ‘trade-off’, as it is known in the relevant literature. At the heart of this ‘trade-off’ there is a negative relation between ‘economic efficiency’, encapsulated in terms of accelerated output or income growth at the aggregate level (typically identified with the ‘national’ economy, namely the sum of all spatial units) and ‘spatial equity’, reflected in gradual improvements in the inter-regional distribution of per-capita income. Richardson (1977) sets up the argument in terms of a ‘trade-off function’ (Figure 1).

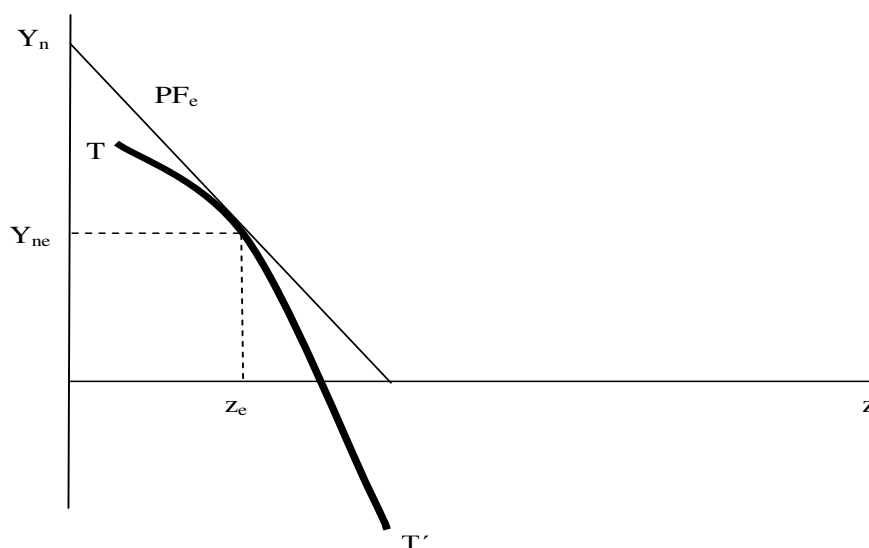


Figure 1: The ‘trade-off’ Function (Richardson, 1977, p. 228)

The curve TT' represents alternative combinations between the growth rate of national output (Y_n) and inter-regional equity (z). This curve is drawn on the assumption that economic efficiency decreases as per-capita income moves towards a more equal distribution across regions. The line PF_e reflects the preferences of a society between ‘economic efficiency’ and ‘regional equity’. These preferences are determined, primarily, by institutional factors prevailing in a society. In these preferences it is possible to include the degree of government intervention, tradition, pressure groups or lobbyists, and so forth. A ‘social optimum’ is given by the point where TT' is tangent with the line PF_e . At this point there is a rate of aggregate growth (Y_{ne}) which corresponds with a socially ‘acceptable’ level of inter-regional

income equity (z_e). As it may be surmised from Figure 1, Richardson (1977) essentially ascribes a kind of ‘inevitability’ to this ‘trade-off’ relation given that consecutive increases in inter-regional equity, i.e. above the ‘acceptable’ level z_e , will result to diminishing (or even negative) rates of growth.

Is this ‘trade-off’, however, *really* inevitable? If not, is it possible inter-regional inequalities to be reduced without losses in terms of efficiency? The existing literature, however, offers little guidance in answering such questions¹. In this paper an attempt is made to examine empirically the possibility that the ‘trade-off’ might be overcome by *persisting intervention* to reduce regional inequalities. The argument runs as follows. It is quite possible that policies improving inter-regional equity might activate ‘idle’ or ‘underutilized’ resources which do not contribute entirely to a nation’s full economic potential. This activation will generate increases in output promoting ‘economic efficiency’. In this case the ‘trade-off’ is absent.

For ease of presentation we will assume a direct relation between inter-regional inequality (ξ) and national growth (Y). As shown in Figure 2, a ‘trade-off’ is apparent at higher levels of inter-regional inequality. To understand the forces at work it is useful to consider the following thought experiment. It is not unreasonable to take for granted that lagging regions have limited ability to absorb and assimilate the resources stimulated by regional policies. Nevertheless, the *persistence* of regional policy in alleviating spatial inequalities² might improve the underlying ‘infrastructure’ in lagging regions. Here, the term ‘infrastructure’ is used not only in the sense of mainstream economics (e.g. physical infrastructure creating the potential for new business and employment³), but is enhanced with all those features that have a positive impact on the social welfare within a spatial unit. Equity of opportunities, an ability to accept and incorporate new knowledge/ideas, participation of agents to the decision-making process and so forth, can be mentioned indicatively. Overall, ‘infrastructure’ can be conceived as a notion that includes all the elements related to the reduction of inequalities and strengthening social cohesion. An improvement of these elements might be accompanied with an increase in the rate of economic growth.

These considerations are depicted by a ‘U’-shaped curve (Figure 2) suggesting that the ‘trade-off’ does not appear in certain levels of inequalities, which lie below a ‘threshold’ level of ξ , let ξ^* .

¹ Such studies tend to treat this relation as a ‘side-effect’, arising from increasing congestion costs in heavily agglomerated regions, inspired by the various models of the ‘New Economic Geography’. For a more detailed analysis see Martin (2008). Furthermore, the existing studies take a rather *static* view on the issue. Our analysis differs in the sense that the trade-off is examined over the long-run.

² In terms of Figure 2, this is identical to a move towards the origin of the axes, which indicates absolute inter-regional equality.

³ The issue of equity and efficiency was used in mainstream economics to study the regional impacts of public investment schemes (e.g. Anderstig and Mattsson, 1989).

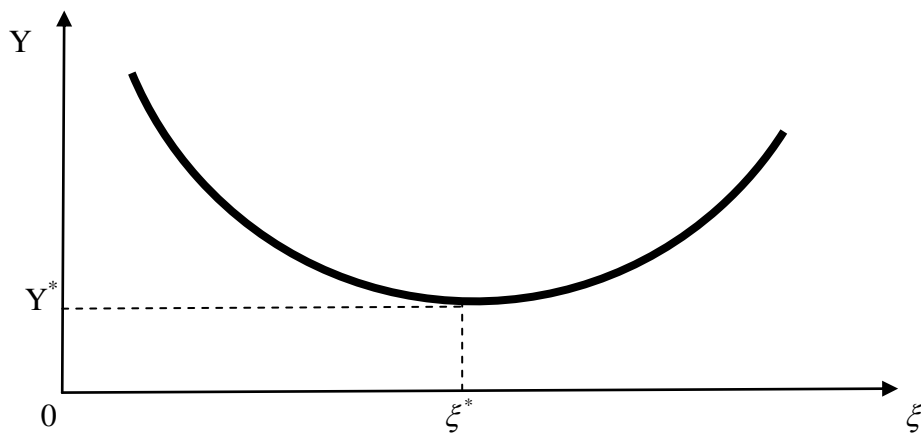


Figure 2: Complementarity between ‘efficiency’ and ‘equity’

Moving away from these abstract considerations, so as to get closer to the complications of the real situation, an empirical approximation of the critical variables is necessary. To that effect, a scheme of measurement is developed in Section 3 to calibrate our argument and US State data for the period 1972-2005 are utilized to develop the empirical analysis.

3. Testing the ‘Trade-off’ Issue across the US States

Of fundamental importance to our analysis is to approximate empirically the terms of ‘economic efficiency’ and ‘inter-regional inequality’. Beginning with the latter variable, most frequently analysis of disparities across a set of spatial units (regions, cities, etc) is based on relatively aggregated measures, such as for instance the coefficient-of-variation (CV) of per-capita income⁴. ‘Economic efficiency’ can be approximated by several alternative measures. Predominantly among them is the growth rate of output/production or employment at the national level. A more appropriate measure, however, seems to be the growth rate of output/production since employment is related to social equity considerations, which in the present analysis are captured by the CV.

The context upon which the empirical analysis will be conducted is the 51 US States over the period 1972-2005. This choice was made considering the importance of the US economy, the diversification of its territorial units and the various administrative divisions, such as the Bureau of Economic Analysis (BEA) Regions and the States. Selecting the 51 US States, instead of the 8 BEA Regions, is justified on the grounds that at higher levels of territorial aggregation, inequalities might become less identifiable.

⁴ The coefficient-of-variation is amongst the most acceptable measures in the existing literature. See for example Cowell (1995), Rietveld (1991), Breunig (2001), Formby *et al.* (1999), inter alias.

A scatter plot between inter-regional inequality and economic efficiency across the US States over the period 1972-2005 is presented in Figure 3. After experimenting with several functional specifications, equation (1) gave the best fit to the data⁵:

$$\dot{g}_t = \underset{(1.916)}{227.19} - \underset{(-1.851)}{27.49} \xi_t + \underset{(1.808)}{0.84} (\xi_t)^2, R^2 = 0.145 \quad (1)$$

where \dot{g}_t is the national growth rate and ξ_t is the coefficient-of-variation of per-capita income at time t .

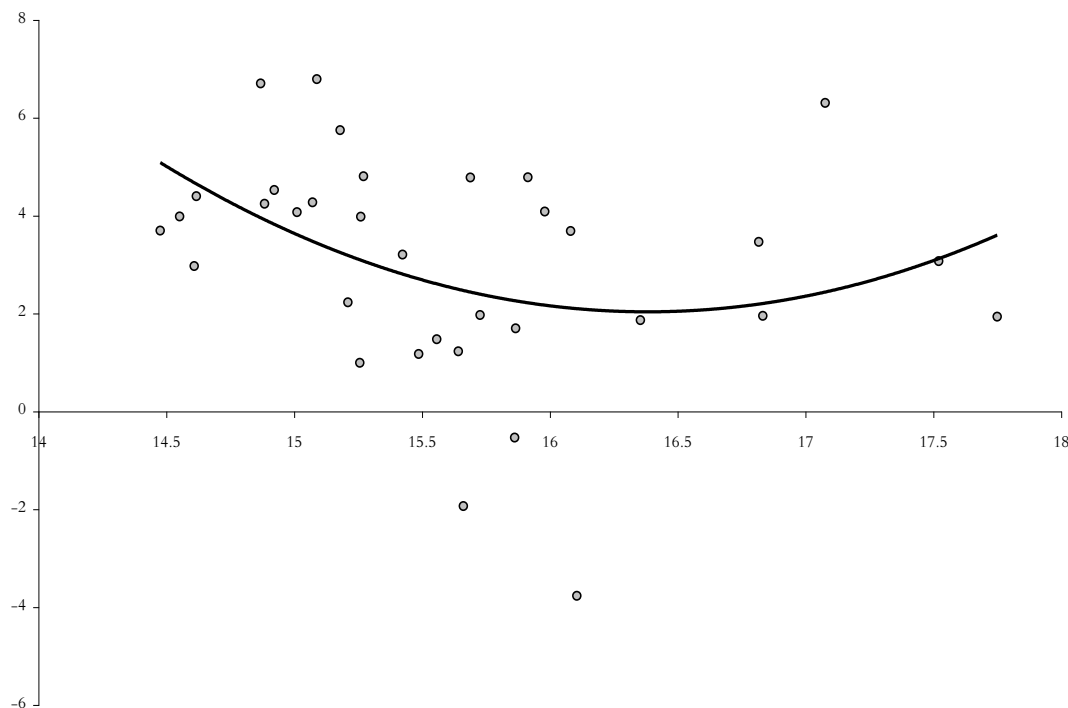


Figure 3: ‘Trade-off’ between ‘efficiency’ and ‘equity’, US States, 1972-2005

Figure 3 shows a ‘U’-shaped curve, which seems to corroborate the argument put forward in Section 2. At relatively low levels of inter-regional inequality, national growth increases along with improvements in inter-regional equity. From this point of view, it might be argued, that a ‘trade-off’ relation is inapplicable. Such a relation emerges after a *critical* level of inter-regional inequality. The estimated coefficients in equation (1) imply that this level is 16.4% and corresponds to a rate of national growth around 2%. Assume that regional inequalities increase beyond that critical level, say to 17.8%. This level corresponds to a higher national rate of growth, 3.6%. Given the functional form, however, for each rate of growth there are two corresponding levels of inter-regional inequality. Hence, a rate of growth of 3.6% can be also achieved at a relatively lower level of inequality, viz. 15%. Clearly, in this case, inter-regional equity goes ‘hand-in-glove’ with ‘economic efficiency’. The message from this empirical application is quite clear. In the case of the US States the

⁵ The final choice was made taking into account the statistical significance of the estimated coefficients and the R^2 . Equation (1) is estimated with the OLS method and the numbers in parentheses are the obtained t-ratios for each estimated coefficient.

two major aims of regional policy, 'equity' and 'efficiency' are not competitive but rather *complementary*.

4. Conclusions

Although a number of theoretical models have paid attention to issues of a 'trade-off' between 'economic efficiency' and 'regional equity', the empirical testing of this relation is largely overlooked. We have attempted in this paper to address empirically the question of whether there is a complementarity between 'efficiency' and 'equity', using data for the 51 US States over the period 1972-2005. To this aim, a somewhat simple empirical expression between 'efficiency' and 'equity' was deployed. Despite its simplicity, its implications are quite deep. A conflict between 'efficiency' and 'equity' is not an indispensable element in the course of implementing regional policies, as the initial (conventional) formulation of the 'trade-off' model advocates. It is established on methodological grounds that it is quite possible that the 'trade-off' relation can be circumvented. Inspection of the data at hand, clearly suggests that efficiency, reflected in high rates of growth, can be achieved *simultaneously* with relatively low levels of inter-regional inequality. This may provide a useful framework for an effective development of regional policies. A conflict between 'efficiency' and 'equity', therefore, should not be conceived as an obstacle to pursue active and persisting policies in order to improve income distribution across regions.

The evidence that is put forward in this paper, however, refers to an advanced economy over a specific time period. Consequently, it should be seen as indicative at best, while the analysis undertaken should be replicated as additional data become available to check whether the conclusions that we reach can be confirmed further. In addition, more thorough empirical investigations are needed especially for countries in different states of development and various degrees of regional imbalances. What then is the purpose of this paper? Perhaps the main purpose should be to provoke interest and more empirical discussion in the conflict or complementarity in the aims of regional policy.

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