Temporal and Spatial Elements in Regional Employment Models. The Spanish Case

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Abstract: Problems associated with employment have become a major issue in regional economics, especially in those countries, such as Spain, where unemployment represents a serious threat to social welfare and economic growth. In this context, the purpose of our paper is twofold: first, to examine the capabilities of different econometric techniques to deal with the question of modeling and forecasting employment regional time series; secondly, to use these techniques in order to obtain short term forecasts of regional employment for the case of the Spanish regions for the period 2006-2007 and to compare them.

Independently of the objectives (forecasting, modeling, simulation, etc.), a basic question that must be observed in solving this problem is that we are dealing with data representative of a group of economies which form part of a more general structure called national economy. In the case of Spain, and most other developed economies, this is a truly integrated regional system for which we need comprehensive and flexible econometric tools, whose purpose is to assure an efficient use of the temporal and spatial dimension of the sampling information. This is the central issue of the paper: how to guarantee such efficiency when analyzing labor markets with a spatial layout.

The paper is organized as follows. The first Section presents a brief Introduction to the general problem of regional modeling, describing with greater precision both the objectives and the hypothesis. The content of Section 2 is mainly methodological. In that section we discuss the different techniques which, we think, adapts better to the problem. Section 3 is devoted to a detailed empirical application of the techniques described in the previous section. As said before, we will study the data on employment for the Spanish regions and the objective is to forecast the period 2006-2007. The same problem (forecasting) will be solved using different approaches, which will allow us to evaluate the weaknesses and advantages of each of them. The main conclusions that can be drawn from this exercise are presented in Section 4, which closes the paper.

Basically, we could identify two major approaches to the modeling problem described above. The first is characterized by its time series foundation, in the sense that the emphasis is on the time series properties of the employment (regional) variables. Transfer function models may be used in that case although we prefer the Vector Autoregression (VAR) methodology. There are several reasons for taking this decision, among which we could mention the sample size of the se-
ries (large enough to support this approach) and the recent advances made in this field in order to introduce the spatial dimension into the traditional VAR equations. The works of Davis and Weinstein (2002) or DiGiacinto (2003) are good examples. The VAR methodology is well-known in Applied Econometrics although it does occur the same with the problems raised by the Space in this type of models, usually of a ‘spaceless’ nature. There are some proposals in the literature such as using spatially filtered variables (Badinger et al, 2004) whose utility is doubtful. In this sense, we prefer formally modeling the cross-sectional relationships as part of the general VAR model. This approach allows us, for example, to distinguish between spatial and temporal nonstationarity in the data and to deal with the difficulties created by the existence of spatial dependence on unit root tests. Our purpose is to go deeply into these methodological questions in order to specify a real Spatial VAR model.

The second approach corresponds to panel data models and differs from the previous one in that it is more firmly rooted in the spatial dimension of the data. Because of their design, panel data specifications work better with the problems posed by the space; mainly, heterogeneity or instability of the relations and spatial dependence between the observations. This characteristic has been extensively recognized in the specialized literature. Also in the case of panel data models there has been very interesting proposals in recent years that have enlarged the scope and the ability of this type of models to deal with spatial mechanisms (for example, the works of Elhorst, 2005, or Baltagi et al., 2006) and we would like to explore these possibilities. In our case there is a difficulty associated with the data. The frequency of the regional employment series is quarterly but we lack enough statistical information with respect to many relevant variables that must enter into the equation. This deficit will be, at least, partially corrected by means of a more intensive exploitation of both the time and the spatial dynamics of the regional labor series.

As said before, we will solve a double econometric modeling exercise in relation to the same variable: quarterly regional employment. In first place we will concentrate on a spatial VAR approach and, subsequently, we will move to a spatial dynamic panel data approach. After that, we will confront the two approaches by comparing their forecasting ability in the way of Giacomini and Granger (2004). Our a priori hypothesis is that the differences, if any, will be very small.

References


Davis D. and D. Weinstein (2003). Bones, Bombs and Break Points: The

