The pathbreaking contributions by Andrew Cliff and John Ord (1973), who coined the notion spatial autocorrelation, and Jean Paelinck and Leo H. Klaassen (1979), who published the first monograph with the title *Spatial Econometrics*, gave rise to a new field of research. In the three decades since then, the aim of complementing “general econometrics with ‘spatial’ (i.e. geographical) elements,” as Jean Paelinck puts it, has made rapid headway, especially since the influential contribution of Anselin (1988). However, up to the second half of the nineties, the development of methods for spatial econometrics was well in front of applied research. In the introduction to their 1995 book *New Directions in Spatial Econometrics*, Luc Anselin and Raymond Florax deplored the lack of acceptance of spatial econometric methods in current empirical research in regional science and regional economics. Since the late nineties, however, the picture has completely changed. In the prologue to *Advances in Spatial Econometrics*, a successor volume of *New Directions* published in 2004, Luc Anselin, Raymond Florax, and Sergio Rey state that there is a “tremendous growth in the number of publications in which spatial econometric techniques are applied, not only within regional science and economic geography, but also increasingly in the leading journals of economics, sociology and political science” (p. 1).

Nonetheless, despite the remarkable advances in methodology and acceptance in empirical research, the potential of spatial econometrics for applied empirical work is far from being exhausted yet. Besides progress in computer performance and software accessibility, there are several reasons for expecting a further application and
dissemination of methods explicitly considering economic space in empirical analysis. The first is simply the fact that the availability of regional macro and micro data is improving more and more. This is true not only for cross-sectional data but also for the combination of cross-sectional/time-series data or spatial panels. For example, several supranational organizations like Eurostat now regularly publish regional macro data at disaggregated level for European regions.\(^1\) Second, regional data analysis is on the way because empirical research based on economy-wide aggregate time-series data is unsatisfactory in many instances. Time series during a longer period are often inflicted with structural breaks, inconsistencies of variable definitions, and the like. The information content of a limited number of macro time series is typically not sufficient for reliable tests of competing economic theories. The fragility of estimation results because of poor data availability at the macro level was one of the reasons that led Lawrence Summers (1991) to pose the provocative question regarding whether empirical macroeconomics is a scientific illusion. One way out of the dilemma is to exploit the variance of economic conditions across regions for investigating the nature of economic variables or relationships within the same institutional framework.\(^2\) A careful integration of the cross-section dimension of the economy, however, also requires consideration of spatial dependencies and, therefore, has to rely on spatial econometric methods. Furthermore, spatial econometrics more and more incorporates modern panel data methods.\(^3\) In this context, the notion spatial panel has been coined (see Baltagi 2005). Spatial panel data analysis avoids biased results in the presence of cross-sectional dependence.

A third reason for spatial econometrics to take an even bigger role in the future is that mainstream economics becomes more and more aware of space as an important influence on economic behavior and performance—particularly, for example, in the literature on knowledge creation and diffusion, innovation, and economic growth. Progress in the field of economic geography will foster further application of more sophisticated spatial estimation methods.

The Symposium section of this issue of \textit{International Regional Science Review} is devoted to recent empirical research on regional labor markets and regional inflation, which was presented at the Spatial Econometrics workshop at the Kiel Institute for the World Economy on April 8-9, 2005. All papers have in common that they use regional data and apply spatial econometric techniques to obtain a more reliable picture of basic economic relationships. This is important to improve our understanding of the functioning of the economy in a micro as well as in a macro perspective.

One of the first macroeconomic themes being investigated with the use of regional data is the relationship between wages and unemployment. The wage curve was propagated by David Blanchflower and Andrew Oswald (1994) as an alternative to the traditional Phillips curve. In contrast to the latter, the wage-curve research measures wages in levels, not in growth rates. Starting from Blanchflower and Oswald, a strand of literature has developed scrutinizing the
relationship. More and more sophisticated methods were applied to check whether or not the postulated negative relationship between the regional wage level—controlled for a multiplicity of individual and firm characteristics—and the corresponding unemployment rate is supported by the data. While the first attempts to study wage-curve models used simple cross-section data, more recent studies typically rely on combined cross-section/time series data and apply modern static or dynamic panel data methods. However, most of the hitherto existing studies neglect the spatial structure in the data. The article by Paul Elhorst, Uwe Blien, and Katja Wolf intends to fill this gap. The authors develop a first-difference spatial estimator and test for several alternative specifications of the panel model. The authors argue that neglecting the possible endogeneity of the unemployment in the spatial dimension might bias the results and mask the wage-curve relationship. Applying their estimation and testing method to a comprehensive data set for 114 administrative districts in East Germany in the 1993 to 1999 period reveals the existence of a wage curve also for this part of the country, which still suffers from the deep restructuring process of the economy after the end of the Socialist era. According to the findings of Elhorst et al., the unemployment elasticity of earnings takes a value of roughly \(-0.04\), which in absolute terms is lower than the value found for West Germany or other countries. This may be seen as indirect evidence that such a high level of labor market interventions as East Germany experienced since German unification is likely to substantially weaken market forces—hence, the result seems quite plausible.

The article by Andrea Vaona also deals with important macroeconomic relationships in a regional context. It combines two central topics in empirical macroeconomics, the Phillips curve and the PPP hypothesis. The author argues that the conventional wisdom of an unemployment/inflation trade-off is challenged by the New Keynesian Phillips curve which sees productivity and unit labor costs as driving forces of inflation. Moreover, the hypothesis of a long-run vertical Phillips curve can be put in question. The author derives an empirical model that includes alternative approaches as special cases. He then tests alternative driving forces to assess “new” versus “old” theories. Vaona uses a comprehensive cross-section/time series data set for eighty one Italian provinces in the period 1986 to 1998. After presenting some descriptive evidence, he applies an empirical approach based on spatial filtering and a system GMM estimator. From his analysis, Vaona concludes that there is evidence for spatial correlation in the inflation process. Using the spatial filtering technique proposed by Getis and Griffith (2002), spatial dependence of the variables can be removed for the most part. When a modified New Keynesian Phillips curve approach, as suggested by Gali and Gertler (1999), is applied to the data, it turns out that value-added measures and unit-labor costs are not the driving forces, but rather it is the unemployment rate like in the traditional Phillips curve approach. The author finds evidence for a long-run trade-off between inflation and unemployment at the regional level. There is conditional beta-convergence in inflation rates, and the sluggishness of
inflation rates appear to be modest. The basic results are robust against several modifications of the estimation approach.

In their article, Joachim Möller and Alisher Aldashev start from the observation that labor-market participation rates, especially for females, vary markedly between German regions. From a search-theoretical model, they derive hypotheses for influences on participation behavior. In accordance with standard models, their approach implies that a higher regional wage level stimulates participation, while a higher unemployment rate depresses it. Extending the standard model, however, they also consider the influence of wage dispersion on the labor market behavior of individuals. The authors show that wage dispersion in the lower tail of the distribution decreases the value of search and leads to lower participation rates, whereas the reverse is true for wage dispersion in the upper tail. Therefore, it is necessary to introduce two different measures of wage dispersion, one below and one above the median. The empirical estimates are based on cross-section data for 266 West German and 77 East German districts. In the estimation, spatial correlation is explicitly taken into account. For constructing the spatial weight matrix, the authors use information on commuter streams between regions. They include spatial lags of explanatory variables, consider the endogeneity of the unemployment rate, and test for different forms of spatial correlation. By and large, the empirical findings corroborate the predictions of the theoretical model, although not all effects are statistically significant. The findings also suggest structural differences between the two parts of the country. Spatial econometric methods are useful not only for testing theories but also for regional forecasts.

The article by Simonetta Longhi and Peter Nijkamp starts from the fact that regions should not be regarded as isolated spatial units. It is evident that applying traditional forecasting techniques to distinct time series of regional data neglects important information and, therefore, is far from being an optimal forecasting strategy. Regions are small open economies that are highly interrelated to their neighbors. Longhi and Nijkamp base their forecasts of regional employment on panel estimates of a model taking account of spatial spillovers and spatial heterogeneity. The analysis is based on regional averaged data, not on information on individuals. The data set comprises 326 (West German) regions covering the period from 1987 to 2002. The authors investigate variants of a forecasting model that are analogous to a spatial lag and a spatial error dependence model. The estimates indicate presence of spatial clustering that the nonspatial model is not able to capture. Therefore, one can expect that the spatial outperform the nonspatial ones. Using a contiguity weight matrix, the authors show that this is the case. They conclude that spatial econometric techniques could at least, to some extent, compensate for the nonexistence of data for well-defined local labor market areas. In such a situation, taking into account spatial dependence leads to improved forecasts.

All articles share in common the view that taking spatial interdependence into consideration is highly relevant for empirical analysis of regional labor markets.
Modeling spatial correlation and/or using spatially lagged exogenous variables not only improves the efficiency and fit of cross-section or panel regression but also leads to better forecasts of regional labor market developments. An important reason for this finding might be seen in the fact that spatial econometrics is able to compensate for the lack of data for functionally defined regional labor markets. Hence, as tests of economic theories may have to rely more and more on regionally disaggregated time series, then it is easy to predict that spatial econometrics in general will play an even more important role for labor market analysis in the future.

NOTES

1. For an overview, see, for instance, European Data Service (2006).
2. For example, the low power of unit-root tests applied to typical macro time series is a well-known problem. Taking the cross-section dimension of data into account additionally may certainly alleviate the testing problem. Therefore, numerous tests for panel integration and cointegration have been suggested in the literature and have already found their way into common econometric software.
3. One of the reasons for this is that the panel approach allows dealing more effectively with unobserved regional heterogeneity that may distort the inferences drawn from pure cross section regressions.

REFERENCES