



# Modeling structural change in the European metropolitan areas during the process of economic integration



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## ARTICLE INFO

Article history:  
Accepted 22 October 2013

JEL classification:  
C14  
C23  
C26  
O52  
R1

Keywords:  
Specialization  
European economic integration  
Metropolitan areas  
Semiparametric models  
Generalized additive models  
Interaction models  
Tensor product smooths

## ABSTRACT

The specialization patterns of metropolitan areas are crucial in characterizing the effects of economic integration in Europe. This paper aims to provide and estimate an econometric model that explains both sectoral specialization and sectoral dissimilarity, measured with the GINI and the KRUGMAN indexes, respectively, for 35 European metro areas during the period 1980–2005. A semiparametric approach is proposed to address the issues of non-linearity and separability. The econometric analysis indicates how the deepening of the processes of development and integration occurred in the last decades affected both specialization and similarity of the sectoral metropolitan structure, finally supporting a “specializing alike hypothesis”.

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## 1. Introduction

Metropolitan areas are engines of economic growth and development that concentrate populations and economic activities. This fact might even be considered *the striking feature of today's economic geography* (Fujita et al., 1999). In Europe, the process of economic integration in recent decades appears to have primarily benefited the metropolitan areas, despite the European Commission's efforts to engender economic and social cohesion throughout the regions. The regional policies implemented through the structural funds under Objective 1 have repeatedly been considered ineffective (Boldrin and Canova, 2001; Brakman et al., 2005; Gianetti, 2002; Mohl and Hagen, 2010). In fact, European economic integration has set complex dynamics in motion. Opposite movements prevail at different territorial levels of analysis: a convergence process at the level of member states coexists with divergence processes at the level of regions, both within and between member states (Fayolle and Lecuyer, 2000; Gianetti, 2002; Overman and Puga, 2002; Puga, 1999). This outward discrepancy suggests that, to the relative detriment of the

lagging regions, certain locations – the metropolitan areas – have converged during the process of economic integration (Longhi and Musolesi, 2007).

In the nineties, the emergence of new trends of literature provided sound analytical bases to explain these facts. The choices for the location of production and investment have been explained by modeling increasing returns to scale. This process has resulted in the uneven regional distribution of activities, which is opposed to the perfectly balanced landscape predicted by the traditional theory (Combes et al., 2008). Depending on assumptions concerning labor mobility across regions and the structure of the economies considered, concentration (Krugman, 1991) or specialization (Fujita et al., 1999; Krugman and Venables, 1996) might occur. For Krugman and Venables (1996), *there is a possibility that Europe will develop an American-style economic geography with the growing integration of markets*, i.e., the clustering of activities around major regional locations serving European and global markets. According to the authors, the fall of the formal or informal trade barriers that have divided the European market can reach a level where industrial delocalization and specialization might occur. A relevant strand of the theoretical literature has followed these original studies (Combes et al., 2008; Fujita et al., 1999). Even if Krugman (2010) himself has recognized that the opposition between *American and European style*

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geography has been somewhat magnified, sound empirical evidence for how the EU economic geography evolved during the integration process has yet to be provided.

Specialization patterns indicate potential sources of growth or asymmetric shocks and are crucial in characterizing the effects of economic integration in Europe (Barrios et al., 2003; Brülhart, 2001b). This study aims to fill the remaining gap in the empirical literature concerning the nature of the structural change arising during the integration process.

Different issues are at stake. The question of where economic activity will agglomerate is well documented; this question induces a focus on the metropolitan areas, which are the regional political or economic capital cities that concentrate the sources of agglomeration and sustain the wealth of nations. The question of how economic activity will agglomerate is not as well documented and is directly addressed here. Indeed, metropolitan areas, i.e., the center of the regional models, are more often opposed to peripheries and thus implicitly (and mistakenly) considered as homogenous areas. The highly relevant and poorly documented issue regarding the consequences of economic integration is the internal evolution of this center.

Two aspects have to be considered to fully understand the changes of the European economic geography. The first aspect refers to the sectoral changes within the metropolitan areas, i.e., the evolution of specialization during the process of European integration. The second aspect refers to the changes between metropolitan areas, i.e., the evolution of

their similarities or dissimilarities during this process. As described by Krugman and Venables (1996, p. 960), the increasing specialization and dissimilarity of the industrial structure would be evidence of the emergence of US-like industrial districts in Europe. However, increasing similarities would indicate that some trends towards a homogeneous European city system are at work. These specialization dynamics characterizing the metropolitan areas along the economic integration process remain an ignored but key issue in Europe.

Because definitive predictions concerning the effects of integration on specialization are difficult to settle, empirical work is clearly called for. This study builds on the two basic messages of Leamer and Levinsohn (1994), which are quoted from Brakman et al. (2006), which are as follows: *don't treat theory too casually* and *estimate don't test*. Accordingly, our econometric analysis is inspired from well-grounded theoretical outcomes, which for instance helps us in choosing the explanatory variables but, at the same time, we do not directly follow a particular theory, and we do not intend to test competitive theories among themselves. Our econometric model is a simple reduced specification form aimed at providing insights on specialization patterns in Europe. Particularly, the adopted semiparametric approach allows us to relax most of the restrictive assumptions underlying the standard parametric specifications. We follow a branch of the literature (de Benedictis et al., 2009; Imbs and Wacziarg, 2003) that evidenced the relevance of taking into account nonlinearities when modeling specialization but we extend such literature in three primary directions. First, we

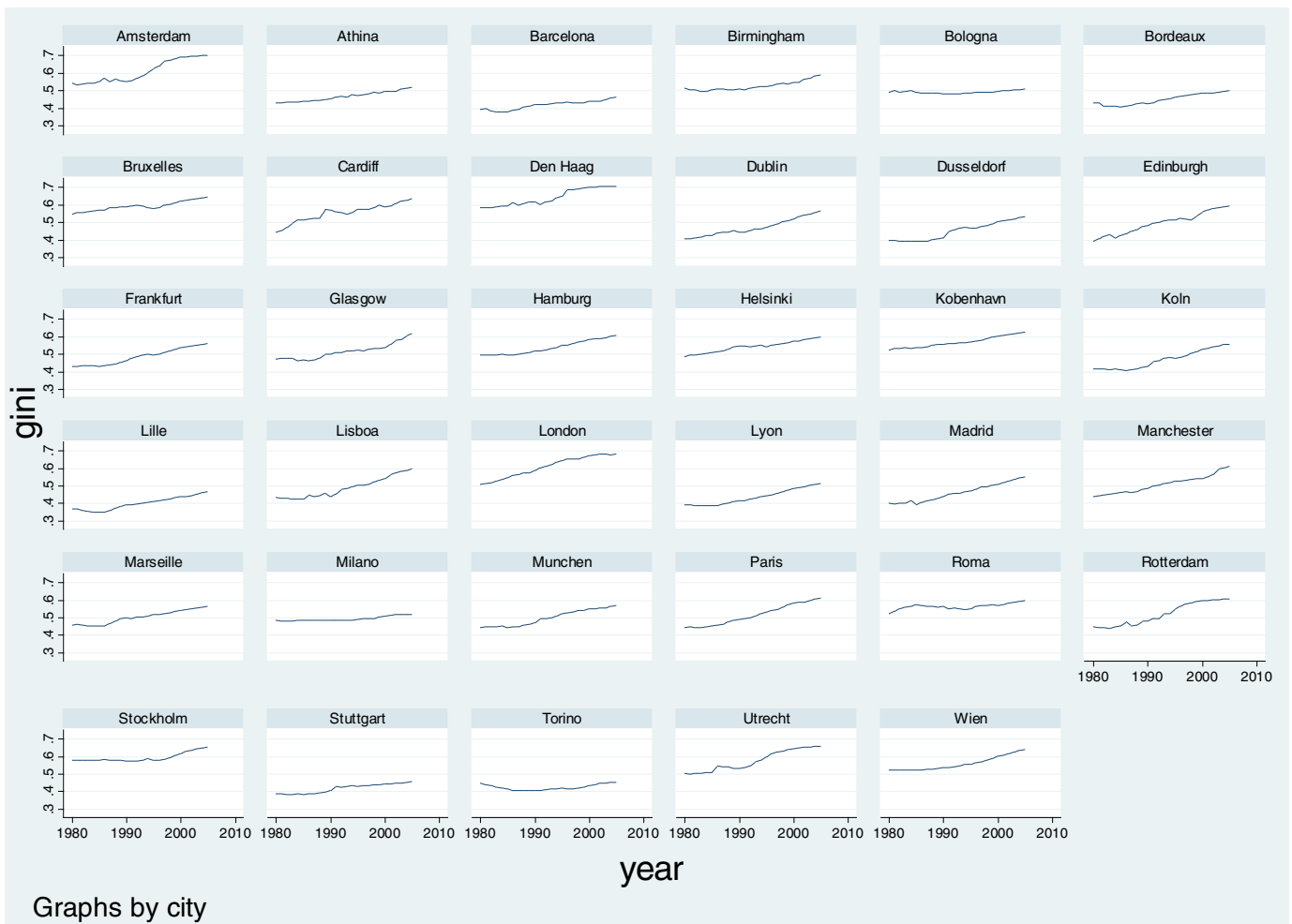


Fig. 1. Gini and Krugman indexes: trends over time and density estimation by  $D_{EUit}$ .

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