

# ASSESSING THE STRATEGIC SIGNIFICANCE OF COUNTRY GEOGRAPHIC LOCATIONS VIA COOPERATIVE GAME THEORY: The Case of European Union

Prof. Dr. Mehmet KÜÇÜKMEHMETOĞLU<sup>1</sup>

Prof. Dr. Yasin FAHJAN<sup>2</sup>

Assist. Prof. Dr. Muhammed Ziya PAKÖZ<sup>3</sup>

## ABSTRACT

Beyond the national leaderships and visionary profiles, each the European Union (EU) countries have certain weights in the union. These weights, on the one hand, can be attributed to the size and scales of countries' economies, on the other hand, can be attributed to the strategic geographic locations and their neighborhood connections in the EU geography. In this research, the strengths and weaknesses of the EU countries originated from geography are measured by means of spatial cooperative game theory applications. Study measures the benefits of geographic continuity as an outcome of coalition by making larger scale and more productive union economy and creating "*home market effect*". Geographic connections between the countries are the necessary condition for setting extensive and ultimately comprehensive coalitions. In other words, geographic continuity is necessary condition to fulfill the economic flows in the EU geography. In this respect, the more spatial connections with the neighboring countries has the more potential to form productive coalitions with the others. Besides, when the size and scale of economies are large, the established coalitions become more productive as compared to the isolated countries or partially small country sub-coalitions. In the developed linear programming based optimization model, which is adopted from urban development/regeneration model allocating density bonuses provided in order to reach extensive and ultimately grand coalition, selected 24 the EU member states are evaluated via spatial cooperative games considering all forms of benefit generating subgroup and grand coalitions among each other at the international level. Coalition benefits are hypothetically derived from trades and flows of goods and services providing *consumers and producers surpluses*, *scale economies* and *home market effect* in the union geography. Results have shown that some the countries at the core of the union have significant economic contribution to the Union. These indispensable countries are Germany, France, Poland, Hungary. When the size of country economies are considered, Germany is the geographic and economic engine of the Union. Finally, these contributions also becomes as a source of expecting, requesting, and extracting more benefits from the Union economy.

**Keywords:** Spatial Game Theory, Multinational Geographic Coalitions, The European Union, Optimization, Linear Programming

---

<sup>1</sup> Şehir ve Bölge Planlama Bölümü, GTÜ, Gebze, Kocaeli, mkucuk@gyte.edu.tr

<sup>2</sup> İnşaat Mühendisliği Bölümü, İTÜ, İstanbul, fahjan@itu.edu.tr

<sup>3</sup> Şehir ve Bölge Planlama Bölümü, GTÜ, Gebze, Kocaeli, mzpakoz@gtu.edu.tr