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The geographical evolution of manufacturing and industrial policies in Turkey

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ABSTRACT

The aim of this paper is to identify geographic patterns of industrial agglomerations at the scale of the province within Turkey using employment levels of industries and to analyze their change over the time period1992 to 2009. Deploying exploratory spatial data analysis, visualization tools, location quotients, and descriptive statistics, geographical dimensions of manufacturing are mapped and the affect of spatiality is analyzed for all industries individually. Results of the spatial statistics reveal the explicit presence of spatial dependence across the provinces in terms of the geographical concentration of industrial agglomerations during the period under consideration. The analyses highlight the spillover effects of first and second generation industrialized provinces to their neighbors while a long-standing gap between the east and the west remains stable. The findings assert the significance of spatial dependency in the geographical evolution of manufacturing and therefore suggest the necessity of integrated regional and sectoral specific industrial policies.

1. Introduction

In terms of industrial geography, the basic outcome of globalization and post-Fordist production systems is the clustering and agglomeration of industries at a variety of geographic scales ranging from national to local levels. As externalities stemming from agglomeration and clustering becomes keys of regional and local development, measuring and delineating geographical concentration of industries has become a basic issue for academics and policy makers. Especially after the emergence of cluster theory in the early 1990s many methods, such as input–output methods, location quotients, principal component analysis, discriminant analysis, social network analysis etc. have been deployed to delineate industrial agglomerations and clusters and their geographical boundaries (Feser & Bergman, 2000; Hill & Brennan, 2000; Solvell, Lindqvist, & Ketels, 2003; Brenner, 2004; O'Donoghue & Gleave, 2004; Reid, Smith, & Carroll, 2008; Titze, Brachert, & Kubis, 2011). The studies deploying those methods mostly treat clusters as sectors or regions that exhibit above average performance compared to other sectors or regions and reduce them to simple geographical concentrations (Marcusen, 2003; Martin & Sunley, 2003). Therefore they neglect socio-political structures and constructive dynamics behind the agglomeration of industries and development of clusters.

The geography of industries is related to their technological base, knowledge architectures, internal and external linkages etc (Menzel & Fornahl, 2009; Ter-Wal & Boschma, 2011). and highlights the construction of new territorial relations and socio-politic structures (Storper, 1997). Those new territorial relations also intersect simultaneously with changing political preferences within and between regions and nations. That is why the shifting spatial boundaries or relocation of industries can often be interpreted as reflecting reshuffled political developments and changing inter-regional balances in a country. In that respect, deploying methods such as spatial data analysis methods and techniques that reveal territorial and spatial effects of industrial agglomerations and their geographical evolution at a national scale is both a meaningful and useful endeavor.

There are many empirical studies that focus on measuring thr concentration of manufacturing at a variety of regional levels in

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Turkey (Öz, 2004; Akgüngör, Kumral, & Lenger, 2003; TÜSİAD-DPT, 2005; Akgüngör, 2006; DTM, 2009). Some researchers have concentrated on the emergence of new industrial cities and their regional-local competitive advantages to understand why some provinces have succeeded in industrialization while others have not (Eraydın, 2002; Armatlı-Köroğlu, 2004; Erendil, 1998; Mutluer, 1995). The general perspective of such studies is focused on the historio-geographical background and socio-politic ties of the cities as institutional structures rather than emphasizing the role of spatiality and the geographical evolution of manufacturing. To the best of our knowledge the exploratory spatial data analysis (ESDA), which is used extensively in the spatial sciences, has not yet been used for analysis of agglomerations of manufacturing in Turkey. In countries like Turkey where essential and rapid transformations have been observed in its industrial geography, ESDA is the best method for analyzing and investigating the dynamics of regions that depend upon manufacturing. Additionally, the absence of detailed sectoral data such as input–output tables at the regional or metropolitan levels makes this method uniquely qualified to understand functional dependence across regions or geographical units.

Analyzing manufacturing with this method may enlighten us as to whether the geographic spread of industrial agglomerations is resulting in inter-province integration and the possible creation of new functional regions. Like other developing countries craft production in Turkey that depends upon low wage labor and low technology and is expected to relocate consistently in response to changing production factors and geographically varying costs. Increasing diseconomies of scale and costs of production factors in cities and large metropolitan area have moved some ancillary industries or supportive and complementary services into neighboring provinces. Provinces that are the beneficiaries of this shifting tend to be those that have a similar or supportive technological infrastructure and relational assets such as cognitive proximity, skills, competences, business networks, institutional capacity etc. Considering spatial proximity and conterminous neighbor relations across geographical units (in our case provinces) spatial statistical methods can be used to identify whether the geographical evolution of manufacturing results in new regional formations or not.

Focusing on the geographical evolution of industries, this study tests whether there is any change in the tendency of manufacturing to agglomerate at the province level in Turkey (NUTS-3 level) and aims to reveal that industrial agglomerations transcend the borders of provinces to create new regional formations by expanding over time. The remainder of this paper comprises five sections. The next section takes a historical look at industrial agglomerations in Turkey and the effects of changing economic policies on its industrial geography. In the third section the methodology and data are described. In the fourth section agglomeration tendencies are analyzed using descriptive statistics and Exploratory Spatial Statistic Analysis for each industry. In the fourth section, the locations of each industry are mapped by Local Indicators of Spatial Analysis (LISA), location quotients, and box maps for 1992, 2002 and 2009. Finally, in the last section general evaluations and results are presented.

2. Overview on geographical concentration of manufacturing in Turkey

Initial efforts to foster industrialization in Turkey begin with foundation of the Republic in 1920s. Three eras of industrialization, from the foundation to the Republic until recent times, can be identified in Turkey. The first era, from foundation of the republic to the end of World War II, is considered the establishment era in which industrial policy and investments were influenced by a policy of statism. The second era extended from the end of World War II until 1980 and represented by planning development policies. Starting at the early of 1930s the State adopted an import substitution strategy that was supported by the introduction of protectionist policies with respect to international trade until 1980 (Keyman & Öniş, 2010; Özaslan, 2006). Not only as regulator but as entrepreneur, state's enterprises had played significant role in formation of geography of industry in Turkey during these eras.

Initial large scaled public investments by the state in mining, cement, weaving, paper, ceramics, glass and iron and steel are first industrial nucleus in the country. Mostly concentrated in major cities such as Istanbul, Izmir, Ankara and Adana, because of natural resources during these eras a small number of strategic metallurgical plants were located in small towns as well (Kepenek & Yentürk, 2000; Sevgi, 1994; Özaslan, 2006). Since state owned enterprises located mostly on the western part of the country, spatial externalities stemming from agglomeration economies attracted private industrial companies to the these areas. This was accelerated especially by mechanization in agriculture and rapid urbanization after 1950. As influx of rural population leaded to the major cities, they became the most attractive areas for private investments in respect of increasing demand and urban economies. Therefore regional disparities and long run west-east gap deepened depending upon large scale public investments and rapid unbalanced urbanization. Towards the 1970s industrial concentration in major cities spilled over their neighbor provinces such as Kocaeli, Bursa, Mersin, Tekirdağ and Manisa (Eraydın, 2002; Özaslan, 2006).

The third era, which began after 1980, witnessed a fundamental change in Turkey's economic and industrial policies. During this period the rigid protectionist and import substitution policies of the previous eras were abandoned in favor of a more neo-liberal export oriented growth strategy. This change was partly a response to the oil crisis of the late-1970s that had resulted in rising production costs. While the new policies retreated state from industrial entrepreneurship, still the state continues to play an important role in regional industrial development in Turkey. In some respects the State's new role became even more critical as they changed the focus of the macroeconomic environment by encouraging privatization, lowering and removing tariffs and quotas, liberalizing international trade and foreign investment while at the same time supporting major infrastructural investments in communications, transportation, human capital, and urban land (Cengiz, 2013; Eraydın, 2002).

While the State has remained extensively involved in economic life via formal institutional arrangements it was the specific relationships between private investors and central political authorities that became particularly important during this period as it was in the past (Buğra, 1995, 2002). In Turkey, for a long period of time, the private sector (particularly in manufacturing) has been highly dependent upon their affiliations with central government to access public capital (Bayırbağ, 2010; Demir, Acar, & Toprak, 2004). Deliktaş, Önder, and Karadağ (2009) argue that these relationships and affiliations impacted regional disparities in private sector manufacturing performance. In a similar fashion some scholars emphasize the important role that political relationships between local private investors and central governments played in the emergence of new industrial districts in the