

## **From Neighborhoods to Nations: The Economics of Social Interactions**

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Cities exist because proximity facilitates interactions between economic agents. There are few, if any, fundamental issues in urban economics that do not hinge in some way on reciprocal action or influence between or among workers and firms. Thus, the localization of industry arises from intra-industry knowledge spillovers in Marshall (1890), while the transmission of ideas arises through local inter-industry interaction that fosters innovation in Jacobs (1969). In fact, the face-to-face interactions that Jacobs emphasizes are believed to be so critical to cities that Gaspar and Glaeser (1997) (and others) have asked whether advances in communication and information technology might make cities obsolete. While there is broad agreement that nonmarket interactions are essential to cities and important for economic performance more broadly, the mechanisms through which local interactions generate external effects are not well understood.

To better understand these issues, this book brings together the urban economics and the social interactions literature both from a theoretical and empirical perspective. Despite the fundamental importance of the underlying questions, this book is a lone star in the literature. It has no equivalent. There are some books dealing with urban economics and economic geography (Fujita, 1989; Zenou, 2009; Fujita and Thisse, 2013), others with social/network economics (Goyal, 2007; Jackson, 2008; Benhabib et al., 2011; Jackson and Zenou, 2013) but none with both aspects.

After a brief chapter (Chapter 1), which gives the general outline of the book, Chapter

2 provides a general overview of the literature on social interactions. This is an important chapter because it is the only one that has an explicit social network (graph) analysis. It starts with a simple linear model where the reference group of an individual is his/her neighborhood. In this model, the action of an individual is a function of his/her own characteristics, the characteristics of his/her neighborhood (contextual effects), the average action of the persons from his/her neighborhood (endogenous effect) and an error term. As noted by Manski (1993, 2000) and Moffitt (2001), it is important to separately identify peer (endogenous) effects from contextual (exogenous) effects. This is because endogenous effects generate a social multiplier while contextual effects don't. For example, in the context of education, this means that a special program targeting some individuals will have multiplier effects: the individual affected by the program will improve his/her performance at school and influence the performances of his/her peers, which, in turn, will affect those of their peers, and so on. On the other hand, if only contextual effects are present, then there will be no social multiplier effects from any policy affecting only the 'context' (e.g. improving the quality of the teachers at school). Therefore, the identification of these two effects is of paramount importance for policy purposes. Another important policy issue in the estimation of social interactions is the separation of peer effects and confounding effects. Indeed, the formation of peer group is not random and individuals do select into groups of friends (or neighborhoods as it is interpreted here). It is therefore crucial to separate the endogenous peer effects from the correlated effects, i.e. the same educational activities may be due to common unobservable variables faced by individuals belonging to the same network rather than peer effects.

In Chapter 2, Ioannides discusses these econometric issues in depth and proposes different ways of solving them ranging from natural experiments to a more structural approach. One popular approach proposed

by Lee (2007), Bramoullé et al. (2009) and Calvó-Armengol et al. (2009) is to use the topological structure of social networks as well as network-fixed effects to identify each of these effects separately. By doing so, these econometric methods show the similarity between the spatial autoregressive (SAR) model, frequently used in spatial econometrics, and the econometrics of networks, therefore providing the first natural bridge between these two areas of research. The author also discusses the non-linear model of peer effects (due to the seminal work of Brock and Durlauf, 2001), the endogenous formation of neighborhoods (or links) and the dynamic model where social interactions change over time. The Appendices of this chapter are very useful since they give some basic definitions of graph theory and, more importantly, a list of the datasets that have some network information, e.g. the National Longitudinal Survey of Adolescent Health (AddHealth), which has been widely used in this literature.

Overall, Chapter 2 is very dense since it covers many different topics from the economics of networks, both from a theoretical and an empirical perspective. For a novice reader, this chapter will be difficult to digest. The book by Jackson (2008) and the overview article by Jackson and Zenou (in press) for the theoretical aspects, and the survey by Blume et al. (2011) for the econometric aspects, will make a good complement to Chapter 2.

Chapter 3 focuses on the location decisions of individuals while Chapter 4 puts forward the importance of firms' location decision. Both look at social interactions between agents. The social interaction part is no longer modeled using graph theory as in Chapter 2 but is determined using an 'externality peer effect' approach, which means that peer effects are conceived as an average intra-group externality that affects all the members of a given group identically. For example, if we want to study peer effects in crime, then we will examine how the average crime rate of my 'neighbors' (i.e. all persons living in the same Census tract as me) affects my own crime behavior. This is the traditional way economists have analyzed peer effects. In the network approach of Chapter 2, the 'peer effect' model builds on the smallest unit of analysis for any cross influence, the

dyad, where the collection of dyadic bilateral relationships constitutes a social network. In other words, not all persons in my neighborhood directly affect my crime behavior but only those with whom I directly interact. The difference is important since, as we mentioned above, the identification strategy that relies on the structure of the network will not work here.

In Chapter 3, the standard sorting model using a random utility approach is exposed both from a theoretical and empirical viewpoint. The focus is on individuals and the way they decide to locate in a city. Ioannides exposes the different ways researchers have been addressing the endogenous location problem, highlighting mainly a structural approach. The famous Schelling model of social interactions is described and it is shown that total segregation persists even if most of the population is tolerant of heterogeneous neighborhood composition.

Chapter 4 mirrors the previous one by focusing on firms' locations and their interaction in the urban space. This is basically a chapter about agglomeration economies. This chapter is mostly empirical and studies how agglomeration can be measured and how it occurs. Surprisingly, in this chapter, the standard economic geography models (Krugman, 1991) using a Dixit-Stiglitz utility function and the more recent model (Ottaviano et al., 2002; Melitz, 2003) using the linear quadratic utility function are not presented. The work of Krugman is, however, indirectly acknowledged in Chapter 4 through the adaptation of his model by Head and Mayer for firm location and the model of Overman and Puga. Also, in chapters 7, 8 and 9 other references to the Krugman model are made.

Chapter 5 is about urban economics with a focus on social interactions. The canonical Alonso-Mills-Muth model is first presented, putting forward the tradeoff between commuting costs and housing prices and space in location decision. Amenities are then added in this model explaining why, in a city like Paris, the rich tend to live in the city center while, in a city like Detroit, Michigan, they tend to live at the outskirts of the city. Interactions between individuals and between firms are then introduced in the canonical urban model to generate agglomeration. Social interactions

are not explicitly determined (as in Chapter 2) but are modeled as ‘externalities’ as in Chapters 3 and 4 and are basically a ‘black box’. It is just assumed that, in the urban space, the closer an agent is to any other agent, the higher is his/her utility because of positive externalities (due for example to face-to-face communication). This is the agglomeration force. The disagglomeration forces stem from the fact that the closer the agents are, the higher the land price will be and the higher are the commuting costs for the workers. This model (in particular, the seminal work of Fujita and Ogawa, 1980) shows that a monocentric city emerges as a unique equilibrium if the positive externalities are high enough compared the costs of disagglomeration. It can also be shown under which condition a polycentric city is an urban equilibrium configuration. In the last part of this important chapter, the author introduces the labor market in the standard model, following the urban search model of Wasmer and Zenou (2002). One of the main results is to show how the urban space can affect the labor market outcomes of workers and vice versa. Indeed, for workers living far away from their jobs, it is more costly to search for jobs, which lead to higher unemployment rates compared with those living closer to jobs. In particular, this can explain why ethnic minorities who tend to live far away from jobs experience higher unemployment rates than workers from the majority group. This is referred to as the ‘spatial mismatch hypothesis’. Ioannides also discusses how social networks in the labor market can be affected by the residential location of workers creating a ‘social mismatch’ (Zenou, 2013) between workers.

Chapter 6 is mainly empirical and looks at the relationship between social interactions and human capital spillovers. It analyzes in a very careful way the well-known urban premium (i.e. the fact that wages are higher in bigger cities) and the resulting spatial equilibrium. Another important issue is how social interactions affect human capital accumulation, looking at both linear and nonlinear models. In particular, the author analyzes the intergenerational transmission of human capital putting forward the correlation between the social and the spatial (geographical) space.

Chapter 7 studies specialization, intercity trade and urban structure. The analysis is mostly theoretical and little is said about ‘interactions’. It relies a lot on the seminal work of Henderson (1974) on the emergence of a system of cities with different level of specialization. Chapter 8 is, in some sense, the empirical counterpart of Chapter 7. It focuses on the empirics of the urban structure and its evolution. The key empirical fact is the famous ‘Zipf’s law’, which states that there is a deterministic relationship between the rank and the size of cities in the same country. For example, if the Zipf’s law exists in a country, this means that the first city in terms of population (New York for the United States) is twice as large as the second city (Los Angeles), three times as large as the third city, etc. This is what has been observed in the United States for the last 100 years and it is one of the best-known empirical facts in economics. The Zipf’s law is very clearly exposed at the beginning of this chapter and then some theoretical explanations (e.g. based on the central place theory) are given to understand the ‘urban mystery’ of the Zipf’s law. The evolution of urban structure is then studied.

Chapter 9 is related to Chapters 7 and 8 as it focuses on intercity trade and long-run urban growth. The new aspect here is the relationship between urbanization and growth and the author tries to answer the complex question of why does a city grow?

Finally, Chapter 10 concludes and gives some avenues of research.

One area of research that should be investigated more in the future is the relationship between the urban and the social space. This book provides some aspects of it but, as stated above, apart from Chapter 2 where the urban space is not explicitly introduced, social interactions are mainly modeled as externalities and their microfoundations are not explicitly determined. This is mainly because very little research has been done in this area. We need to think more about these issues, first from a theoretical viewpoint<sup>1</sup> and then from

1 There are three recent theoretical papers (Helsley and Zenou, 2011; Ghigliano and Nicco, 2012; Zenou, 2013) where both the social network and the urban/geographical space are explicitly modeled.

an empirical one. Bayer et al. (2008) find that individuals who live in the same residential block are 33% more likely to work in the same residential block than two individuals living in adjacent residential blocks. Hellerstein et al. (2011) show that this relationship is all the more true for ethnic minorities. If we want to better understand why ethnic minorities experience adverse labor market outcomes, then the explicit analysis of their networks and its connection to the geographical space is crucial. As shown by Calvó-Armengol and Jackson (2004), social networks tend to be clustered so that workers tend to be friends with other workers with similar employment status. If minorities are separated in both the social and the geographical space, then it will be difficult for them to find a job.

Overall, this is a very nice book on a very complex and wide topic. To analyze urban economics, network economics, labor economics and growth together, both from a theoretical and empirical perspective, is really remarkable. Many topics studied in this book are important and I hope they will be investigated in the future.

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