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Neighborhoods to nations via social interactions ☆

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ABSTRACT

The paper examines decisions by individuals and firms in the presence of social interactions and then turns to cities as the units of analysis. The city-based analysis shows the critical role of intercity trade and its impact on urban sectoral and functional specialization. The paper also examines long-run economic growth in economies made up of cities and Zipf's law in that context. The paper synthesizes key aspects of the social interactions literature with Ioannides (2013) as a background, taking off from key concepts, as presented there and drawing attention to key recent contributions by other researchers.

1. Motivation

Social interactions analysis, which goes at least as far back as Schelling (1969) and Becker (1974), extends the methodological individualism of economics in new directions by focusing on the feedbacks between aggregate outcomes and individual behaviors. All of us engage in social interactions throughout our lives, though we do not label them as such, just as we speak prose without labeling it: Adopting recycling practices; deciding where to live and which schools to send our children to; finding out about "killer apps" from chance encounters at a Silicon Valley barbecue; getting pregnant or not; becoming obese; getting involved in community service; enforcing building code violations; mobile telephony and the sizes of rural settlements in LDCs; changing racial and ethnic prejudices, or using them strategically; revitalizing decaying urban neighborhoods; learning from your classmates; is acne contagious; introducing new farming techniques; naming your newborn child; how does a standing ovation start? Social interactions effects among individuals are thus ubiquitous; they occur in residential neighborhoods, schools, workplaces, or emanate from random encounters and their serendipity. They take the form of neighborhood effects, peer effects, role models, and other ways of social influences across agents that are not mediated by the market.[1]

Among individuals, preferences, beliefs, and constraints faced by one person may be directly influenced by the characteristics and choices of others. The effects of social interactions are similar to those of externalities, but unlike many instances of externalities are not a "side show." In choosing which school to go to or what club to join, one considers how to avail oneself of networking opportunities. Interactions are pervasive and naturally generated in the high densities of population and economic activity that define urban settings, occurring in a multitude of dimensions and scales, spatial and social. For example, does Edinburgh's urban layout has anything to do with the Scottish Enlightenment? Thus one can see them best in an urban setting, and this explains the emphasis of Ioannides (2013). The concept applies equally fruitfully to firms, too. For firms, proximity to their suppliers and to competitors is a key ingredient of new economic geography (Krugman, 1992), but it has been emphasized by urban economics at least as far back as Henderson (1974); see also Glaeser (2000).

Loury (1982) pioneered the use of variables measuring community and family background on educational achievement. Manski (1993, 2000) established a canonical typology which has served as an overarching scheme since then. It goes as follows. Social influences within individuals' social milieus that emanate from the *decisions* of members of one's reference group, like keeping up with the Joneses, are known

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[1] See Arrow and Dasgupta (2009) for the consequences for market valuation of "social" goods.

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as *endogenous* social effects. Effects on an individual due to *characteristics* of members of one's reference group(s) are known as *exogenous*, *or contextual* effects, as when individuals value living close to others with similar ethnic backgrounds, or backgrounds that are likely conducive to practices they themselves value. *Correlated* effects refer to circumstances with different individuals acting similarly because they have similar characteristics, observable or unobservable, or face similar institutional environments.

The fact that the actions of individuals in social contact with one another are interdependent suggests that in seeking to econometrically identify social effects one should exercise caution when using the actions of one's neighbors as explanatory variables. However, such estimates can inform important policy questions. Interestingly, when individuals actually choose their neighbors and thus their neighborhood effects as well, Brock and Durlauf (2001a, 2001b) show that it is possible to identify endogenous social effects, provided that one appropriately corrects for selection bias. Sometimes, interactions are assumed to be group-based, in which case individuals value appropriate aggregates describing entire communities and/or groups within them. Other times, interactions are one-to-one, in which case social network models and appropriate estimation techniques are helpful in providing a primary focus on the microstructure of interactions. Blume et al. (forthcoming) offer thorough reviews of the state of the art in identifying social interactions and Graham (forthcoming) reviews the state-of-the-art on methods based on social network data.

Here is an example emphasizing the importance of separate identification of different types of social effects. Recent research has noted that faculty in economics departments led by widely cited department chairs is more productive in research (Goodall et al., 2014). There can be competing explanations of what type of effects is at work. Professors who have been selected with similar observable or unobservable characteristics have similar productivity, in which case we have *correlated effects*. If faculty "follow the department's official leader", we have *endogenous social effects*. If department chairs help create environments that are conducive to research, by attracting the "right" people, we have *contextual effects*. Naturally, all of the above can be presented simultaneously, in which case it would be important to distinguish their relative contributions so as we may learn for policy purposes from such experiences. That is, the answer to the question can help provide policy guidance on what a university needs to do to help improve the research performance of a particular department's faculty. Estimation of peer effects in education settings raises similar issues [see Angrist and Lang (2004) and Arcidiacono and Nicholson (2005); Sacerdote (2014) reviews the state-of-the-art].

Clearly, choice of neighborhood implies choice of neighborhood effects. This in turn implies that individuals through their location decisions contribute to shaping neighborhoods, cities, and regions, and via international migration, countries as well.[2] Equally important is the role of firms' location decisions, which are influenced by proximity to workers, suppliers, and competitors.

Proximity does not have to be defined as *group membership* only. It is also important to understand how economic agents operate in actual physical space, defined as *distance* between each other, and distance to urban centers within cities, or in social space, which is much harder to define. In particular, the role of social interactions in *human capital spillovers* has motivated considerable empirical research (Moretti, 2004), whose rich findings have been helpful in forming aggregative city-level models that in turn may be integrated into models of the national economy with geographical space receiving particular attention. Social interactions thus serve as an overarching theme in many different settings, and this is central to the approach taken by Ioannides (2013).

Urban settings are particularly fruitful in many different ways. Larger city size allows for greater variety of intermediate goods and services, which are the conduits of modern industrial innovations. The resulting agglomeration of many activities raises urban productivity, but the ensuing increase in congestion is costly. This in turn leads to a key trade-off between the benefits of urban agglomeration and its costs, that would likely depend critically on the industrial composition of cities. Thus there can be a variety of city types in terms of sectoral and functional composition, with different city sizes associated with different city types and functions. Thus, specialized, diversified, satellite, or "bedroom" communities make up entire metropolitan areas, and in turn entire economies, whose urban structure is critically affected by physical geography via travel and shipping costs.

Consideration of the city as the unit of analysis has recently led to the emergence of *urban macro* (Rossi-Hansberg and Wright, 2007), which has been an important and very fruitful approach to understanding the *real* structure of modern economies. These approaches build on foundations of social interactions as cornerstones of individual city economies and the interactions among different cities of an economy.

In the remainder of this paper, I first examine decisions by individuals and firms in the presence of social interactions and then turn to cities as the units of analysis. Of particular interest of the city-based analysis is the critical role of intercity trade and its impact on urban sectoral and functional specialization. I also take up the single empirical fact about city sizes throughout the world that has generated interest much beyond economics: Zipf's law and its relationship to long-run economic growth in economies made up of cities. The paper is not meant as an exhaustive review of the literature. Hopefully, Ioannides (2013) do that and more (up till the time it went to press). Instead, it is meant to highlight central issues in the broad literature, taking off from key concepts, as presented in Ioannides (2013) and drawing attention to key recent contributions by other researchers.

2. Individuals

The important issue here is that individuals' location decisions contribute to giving neighborhoods their distinguishing characteristics. People in choosing where to live plan to do their best with their resources in the neighborhoods where they choose to locate. Neighbors remodeling their homes, or maintaining them better than me provide incentives for me to keep up with the maintenance of my house, much like when an informed friend touts a particular stock and also holds it in her portfolio. This is an instant of *endogenous* social effect: I am influenced by deliberate *decisions* by other members of my social milieu. If people with kids like to live in neighborhoods where other people also have kids, we would have an instance of *exogenous*, or *contextual* effects, which are also *social* effects. Such concerns influence, *inter alia*, house hunting strategies. E.g., people with young children are known to look for pamper boxes in the trash outside homes in neighborhoods they are considering to live in, or conduct a "Values Audit!" (Lieber, 2014) People choosing to live near others of the same ethnic group may act similarly because they have similar characteristics (or face similar institutional environments), an instance of *correlated* effects. Distributions of attributes/demographic characteristics, the "*character*" of neighborhoods, cities, and regions are thus profoundly influenced by individuals' decisions.

2.1. Basic analytics of individuals' decisions in the presence of social interactions

Let us denote i's action by $y_i = \arg\max_{y_i} U(y_i, \mathcal{E}[y_{v(i)}]; \mathbf{x}_i, \mathbf{z}_{v(i)}$; parameters); i's characteristics by $\mathbf{x}_i$, which give rise to correlated effects; i's neighborhood (or social milieu) by $v(i)$, with characteristics $\mathbf{z}_{v(i)}$, which give rise to contextual effects; expected action among the

[2] The US and Canada are known immigration countries with well defined, though hotly debated and changing immigration policies. Some Western European countries are following their lead, by encouraging immigration of highly skilled professionals.

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