What Future for History Dependence in Spatial Economics?[1]

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Abstract

History (sometimes) matters for the location and sizes of cities and neighborhood segregation patterns within cities. Together with evidence on rapid neighborhood change and self-fulfilling expectations, this implies that nature might not completely determine the spatial structure of the economy. Instead, the spatial economy might be characterized by multiple equilibria or multiple steady-state equilibrium paths, where history and expectations can play decisive roles. Better evidence on the conditions under which history matters can help improve theory and policy analysis.

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1. Introduction

What happened to cities in England and France after the Western Roman Empire collapsed? What happened to river cities in the United States after water transport faded in importance over the 19th century? What happened to cities in Germany, Japan, and Vietnam after aerial bombings in 20th century wars? What happened to neighborhoods in cities around the world as the disease environment improved, industrial air pollution abated, and new transportation modes replaced old ones?

These questions ask what happens to a place after a localized shock. The place might be a region, a city, or a neighborhood. The shock might be a natural disaster, a technological innovation, or a policy intervention. These shocks are localized in that they affect some places more than others. Finally, these shocks may be temporary, as in wartime bombings, or persistent, as in the obsolescence of transportation technologies.

These questions also relate to the debate over whether the spatial structure of the economy is uniquely determined by nature. Consider that places might vary in *first nature* or *second nature* (Cronon, 1991). First-nature factors (or *locational fundamentals* following Davis and Weinstein, 2002) are natural factors such as climate, ruggedness, or resource endowments that determine the suitability of a location for the scale of economic activity or a particular economic use. Second-nature factors are manmade factors that are fixed in location, durable, and sunk, such as canals, railroads, or highways.

If first and second nature alone determine the spatial structure of the economy, then it is possible to predict or explain the effects of a localized shock (conditioned on observing the nature of the shock). That is, if we knew how a place's fundamental value evolved over time, then we could possibly predict or explain its fortunes. Following a temporary shock, we would expect the spatial structure of the economy to revert to its original state. Following a permanent shock, we would expect the spatial structure of the economy to converge to a new pattern determined by the new structure of first- or second-nature factors.

Alternatively, the choices of businesses or households might depend on the choices of other firms and people, in a way that breaks the link between nature and place. For example, a firm's presence in a location might increase the productivity of other firms in that location by increasing the quality of employer-employee matches. Or a family's neighborhood choice might increase the appeal of that neighborhood to other households directly by changing the composition of types of households or indirectly by affecting the kinds of services supplied in that neighborhood. Thus, places might vary not in their nature but instead in the invisible economic linkages that accompany agglomeration. For urban and regional economists, agglomeration forces such as these are central to thinking about spatial clusters (Duranton and Puga, 2004).[4]

Environments where one person's choice depends on the choices of others naturally lend themselves to predictions of multiple equilibria.[5] To see this, imagine that firms cared *only* about other firms' locations and not about first- and second-nature differences across locations. Then, they might cluster in *any* place. A sufficiently large temporary shock could lead to permanent change. Alternatively, a small permanent shock to fundamentals might *not* lead to a change in the spatial structure of the economy, if history-dependent forces are strong enough to hold a cluster together. Only a large permanent shock might overcome history and lead to a new, and perhaps more efficient, equilibrium.

In this essay, we review the literature analyzing the effects of historical shocks on places. These studies help us to understand whether the spatial structure of the economy is uniquely determined. Many papers reviewed here suggest that temporary shocks have led to permanent change, and thus provide evidence for history dependence. We also consider a broader range of evidence from studies of the speed of neighborhood transitions and a small literature on the role of self-fulfilling expectations in economic geography. Taken together, this evidence suggests that

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[4] We distinguish second-nature factors, which are fixed in location, durable and sunk, from (static) agglomeration factors, which depend on the contemporary location of mobile factors. Unlike Krugman (1993), Cronon (1991) uses "second nature" to exclusively refer to legacy historical factors. This distinction is useful to preserve. Policymakers may care whether economic geography can be affected through fixed, durable, and sunk infrastructure investments (e.g., highways) versus programs targeted to mobile factors (e.g., cluster policies). In addition, the relative importance of legacy or contemporaneous agglomeration forces affects equilibrium characterization in recent theoretical models (Allen and Donaldson, 2020).

[5] For example, see Krugman (1991a) and Arthur (1994).

there are clear examples of path dependence and, at least in some cases, the economy's spatial structure may not be uniquely determined.

There are a few more unifying themes in this literature. One is the use of historical data. Spatial structure changes very slowly. In Europe, many cities founded by the Romans thrive today (Michaels and Rauch 2018). Japanese city sizes from the Stone Age are correlated with city sizes today (Davis and Weinstein, 2002). In England, poor neighborhoods during the Industrial Revolution are still poor today (Heblich et al., 2016). This slow adjustment of regions, cities, and neighborhoods has led researchers to construct historical databases over long periods of time. Combined with large shocks to urban systems, these data allow researchers to distinguish short- and long-run impacts of shocks.

A second theme is that spatial scale matters. Our review covers studies that examine continents, regions, cities, and neighborhoods. What is true at one scale might not be true at another scale. Different settings vary in terms of the importance of first- and second-nature factors; the scale and sources of increasing returns or externalities; moving costs; the sizes of various policies or shocks. While we provide examples of shocks at varying spatial scales, our review makes clear that the way in which spatial scale matters is not yet clear.

These studies contribute to our understanding of the central question in urban and regional economics: What explains the highly uneven distribution of economic activity across space? Few dense, large, highly productive cities coexist with smaller towns, while most land is lightly populated. At a more detailed spatial scale, downtowns teeming with highly productive office workers coexist with neighborhoods of extreme poverty. Analyzing how localized shocks affect places improves our understanding about the forces responsible for these wide spatial disparities, and our understanding of how spatial allocations might be changed.

These questions are also important from a policy perspective. If the size and types of economic activity in a place are pinned down by fundamentals, temporary spatial policies seem unlikely to succeed. On the other hand, if spatial structure is history dependent, then temporary policies

might cause permanent changes and policymakers might be able to influence the long-run geographic distribution of economic activity.

Overall, history (sometimes) matters for the spatial structure of the economy. Together with evidence on the speed of neighborhood transitions and the role of self-fulfilling expectations, this implies that nature might not completely determine the spatial structure of the economy. Instead, the spatial economy might be characterized by multiple equilibria or multiple steady-state equilibria, where history and expectations can play decisive roles. A wide range of outcomes might be possible.

Better understanding of the conditions under which history matters can help improve theory and policy analysis. If there are many possible worlds—if anything could happen—then theory may not offer sufficient guidance in policy analysis (Hahn, 1991; Bleakley and Lin, 2015). If only history matters, then we may be stuck with just-so stories which may have limited external validity. Is economic analysis confined to be "essentially historical" (David, 1985)?

One possible path forward is to better characterize the conditions under which history matters. When and where does history matter, and when and where does it not? What are mechanisms that drive history dependence? At what spatial scales are history dependence and multiplicity most likely, and why? If spatial structure is history dependent, what size shock necessarily leads to persistent changes? Answering these questions may allow us to better predict the consequences of localized shocks and design better place-based policies.

2. Evidence from history dependence

That nature determines the spatial structure of the economy is an old idea.[6] Kohl (1841) investigates the relationship between the natural environment and the location of cities. Cooley

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[6] Whether or not nature determines the spatial organization of the economy closely echoes a long-standing debate in development economics over the role of the natural environment versus other factors, such as institutions. (See, e.g., Diamond, 1997; Engerman and Sokoloff, 1994; Gallup, Sachs, and Mellinger, 1999; North, 1990; Acemoglu, Johnson, and Robinson, 2001.) For a recent survey, see Nunn (2014).

(1894) links natural topography to transportation costs and then transportation routes to spatial organization. More recently, Henderson et al. (2018) analyze the role of natural factors in the worldwide spatial distribution of economic activity. Nighttime lights measured by satellites are correlated with a host of natural factors, including temperature, precipitation, land suitability, elevation, ruggedness, malaria transmission, and distance to a coast or harbor.

At the smaller spatial scale within cities, Lee and Lin (2018) find that natural factors such as ruggedness or coastal proximity predict the average household incomes of neighborhoods. Indeed, this relationship appears to hold true dating to antiquity: In Ancient Rome, "certain districts are favored more than others; some, because they are more accessible; and others, because they are beautiful in themselves or command a fine view" (Witherstine, 1926).

Experience, intuition and evidence suggest that nature plays an important role in determining the spatial structure of the economy. But do other factors matter, in a way that might break the link between nature and economic geography? Davis and Weinstein (2002) propose an interesting test: If nature alone determines relative city sizes and one particular city is hit by a large, temporary, exogenous shock, then we would expect that city to revert to its original growth trajectory. Famously, they document that Japanese cities, including Hiroshima and Nagasaki, converged quickly to their original growth paths and industrial compositions following the bombings of World War II (Davis and Weinstein, 2002, 2008). They conclude that nature appears to play a dominant role in determining the size and location of cities. In other words, history does *not* matter in the long-run spatial structure of Japan.

Davis and Weinstein (2002) distinguish persistence from path dependence. Based on archaeological records, they document remarkable persistence in Japanese city sizes over 8,000 years. But, as they emphasize, persistence by itself is not dispositive about the relative importance of first nature, second nature, and agglomeration factors in determining the spatial structure of the economy. This highlights the value of the World War II bombings as a large, *temporary* shock to city sizes. The long-run stability of the Japanese urban system following these shocks is important evidence against an important role for history in the spatial economy.

Since Davis and Weinstein (2002), a sizable literature documents the importance of locational fundamentals (Bosker et al., 2013; Bakker et al., 2020a) and mean reversion in growth rates following localized shocks (Glaeser and Shapiro, 2002; Brakman, Garretsen, and Schramm, 2004; Beeson and Troesken 2006; Miguel and Roland, 2011; Cuberes and Gonzales-Val, 2017; Jedwab, Johnson, and Koyama, 2019; Xu and Wang, 2019).[7] Taken together, this evidence seems to confirm the primacy of nature as a factor determining spatial structure.

However, several studies have found evidence of history dependence following the Davis and Weinstein (2002) test. Bleakley and Lin (2012) find history dependence in the location of cities in the U.S. Southeast and Midwest. Many cities formed at obstacles to water navigation, where continued transport required overland hauling or portage. These portage sites attracted commerce and supporting services, and places where waterfalls provided waterpower attracted manufacturing during early industrialization. Although their original advantages have long since become obsolete, their sizes relative to other cities have remained constant. Further, there is little evidence that portage cities today are relatively abundant in observable second-nature factors such as roads, railroads, or houses. These results support the importance of contemporary agglomeration forces. The persistence of portage cities suggests that the economic geography of the Southeastern and Midwest U.S. may not be uniquely determined by fundamentals.[8]

Path dependence is observed not only in city sizes, but also for city-industry location.[9] For example, Redding, Sturm, and Wolf (2011) study the location of hub airports in Germany after World War II. After the division of Germany, the central air hub moved from Berlin to Frankfurt. Following German reunification, hub traffic did not return to Berlin. This result suggests that the location of an air hub is not uniquely determined by fundamentals and that there may be instead a range of possible steady state locations. Differences in economic fundamentals are dominated by the substantial sunk costs of creating the hub. Kline and Moretti (2014) show

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[7] An under-examined question in this literature is the extent of government, through coordination or direct investment, in supporting the post-shock recovery. Xu and Wang (2019) document significant government investment in neighborhoods damaged by the Hanshin earthquake of 1995.

[8] In a similar vein, Jedwab, Kerby and Moradi (2017) find that post-colonial Kenyan cities persist in relative size following the loss of railway access. Bakker et al. (2020b) show that a temporary migration shock in South Africa led to permanent change of city sizes. Accetturo et al. (2019) show that the location of southern Italian cities was shaped by pirate attacks.

[9] A large literature in political science also studies path dependence of institutions, see Pierson (2000).

that a temporary regional development program led to gains in manufacturing that continued well beyond the duration of the program. Both Redding, Sturm, and Wolf (2011) and Kline and Moretti (2014) emphasize the emergence of second-nature fundamentals and economies of density.

Hanlon (2017) analyzes the effect of the U.S. Civil War on the spatial structure of the U.K. textile industry. The war resulted in a reduction in the supply of cotton to the U.K., which put cities specializing in cotton textiles under economic pressure. Not only did these cities suffer short-term loss of population compared with other textile centers based on wool, linen, or silk, but these negative effects persisted well beyond the duration of the war. The temporary shock to cotton supplies appears to have had a persistent effect on the relative sizes of city-industries, suggesting a transition from one equilibrium to another.

At a neighborhood scale, obsolete historical factors affect patterns of urban form and segregation today. Ahlfeldt et al. (2015) find that the division and unification of Berlin had persistent effects on the structure of land use and land values. Villarreal (2014) documents that historical marshes and correspondingly poor disease environments in 19th-century New York City predict household incomes in the 21st century. Brooks and Lutz (2019) find that streetcars in Los Angeles, eclipsed by cars and buses by the late 1910s, continue to affect land use today. Ambrus et al. (2020) find that a cholera epidemic in a single London parish in 1854 predicts differences in housing prices today. Heblich et al. (2016) show that historical air pollution in 1880 English cities predicts income sorting patterns today. Kocornik-Mina et al. (2020) show that flooded cities do not seem to adapt to this locational disadvantage, even when there are nearby safer areas.

If the costs of moving from one equilibrium to another are high then the welfare implications of path dependence may be significant. Some bounds on the transition costs of urban systems are provided by Michaels and Rauch (2018), who study urban systems in England and France after the fall of the Roman Empire. Between the third and sixth centuries, cities in England collapsed, while cities in France remained inhabited.[10] At the same time, trade on rivers and along the coast

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[10] Barsanetti (2020) finds evidence of history dependence in the location of settlements in southern Brazil.

became more important in the region. When England re-urbanized, cities emerged in locations near navigable rivers and the coast, while French cities remained in (non-coastal) Roman locations, and grew less. These results suggest, *pace* Rauch (1993), that path dependence in spatial equilibria might have sizable welfare consequences.

History dependence in urban and regional economics can be interpreted in a common framework incorporating increasing returns or externalities, moving frictions, and durable factors.[11] A historical factor affects the economic geography of the past (first nature). Some fixed durable investments are made, in infrastructure, housing quality, etc. (second nature). Moving is costly. And there are spatial spillovers in production or consumption. In such a framework, persistent effects of temporary localized shocks (or null effects of permanent localized shocks) can be rationalized by differences in first nature, differences in second nature, large migration frictions, or strong spatial spillovers. Many of these path dependence studies have carefully ruled out some of these factors using control variable strategies, identifying settings with few omitted factors (such as the U.S. Midwest), and exploiting clever natural experiments.[12] Still, even in the most clever research design it can be somewhat difficult to distinguish, say, second-nature factors from agglomeration factors. Beyond that, there is the generic problem of generalizing from one particular historical setting. If no study is perfect, and each relies on an idiosyncratic natural experiment, what can we learn from the literature as a whole?

One possible answer may lie in comparing studies across different spatial scales. There is a plethora of evidence that wartime bombings or infectious diseases have little permanent effect on the relative sizes of cities. In fact, with a few important exceptions, major temporary shocks do not appear to permanently affect the fortunes of cities or large regions. In contrast, there is perhaps more evidence of history dependence in the location and scale of city-industries and even more evidence of history dependence in neighborhood sorting and segregation. What factors might distinguish city-industries or neighborhoods from regions in making history

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[11] These echo David's (1985) conditions for path dependence: technical interrelatedness, economies of scale, and quasi-irreversibility of investment.

[12] In a recent work, Brown and Cuberes (2020) study the Oklahoma land run and find large importance of second-nature forces.

dependence and multiplicity more empirically relevant?[13] These factors may provide guidance on when history matters, and when it does not.

3. Evidence from the speed of change

Path dependence is not the only prediction of models featuring multiple equilibria. The degree of multiplicity may depend on the extremity in variation in first-nature factors. Bleakley and Lin (2012) suggest this is a possible explanation for their contrasting results compared with Davis and Weinstein (2002, 2008). Japan's varied topography highlights the large variation in natural value of locations, perhaps enough to preclude the existence of multiple equilibria.[14] Sufficient *ex ante* heterogeneity may guarantee uniqueness of equilibrium or limit the scope for multiplicity (e.g., Cuberes, 2009).

Some evidence for this hypothesis at the neighborhood scale is provided by Lee and Lin (2018). Naturally heterogeneous cities such as Los Angeles feature persistent spatial distributions of household income. In contrast, relatively flat, naturally homogeneous cities such as Dallas show a great deal of churning in what types of households live where at decadal frequencies. Lee and Lin (2018) interpret these findings in a model where strong consumption externalities lead to multiplicity in spatial equilibria, but first-nature heterogeneity reduces the scope for multiplicity.[15]

There is an important but somewhat separate literature in urban economics that features location choice with strong consumption externalities. In models following Schelling (1971), households have preferences over the types of their neighbors. These models typically feature multiple equilibria. Transitions between equilibria are described as tipping; once the minority share in a

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[13] Another possibility is that these diverging results across spatial scales are due to statistical aggregation.
[14] Bosker et al. (2008) study the growth of German cities after the bombings of WWII and find support of multiple equilibria.
[15] The common cross-sectional observation of high-income and low-income neighborhoods at close proximity to each other further suggests scope for multiplicity in urban spatial structure, since these neighborhoods likely share similar fundamentals. Another observation that is consistent with multiplicity is the variation across cities in the centralization of income (Brueckner et al., 1999).

neighborhood exceeds a "tipping point," all the whites leave *en masse*. One distinct perspective in this literature is the emphasis on the quick *speed* of transition.

Card, Mas and Rothstein (2008) find evidence for tipping behavior in a study of U.S. city neighborhoods. Using a regression discontinuity approach, they find that neighborhoods with minority shares just below a flexible tipping point – typically about a 5% minority share – tend to increase sharply in white population in the subsequent decade, while neighborhoods with minority shares just greater than the tipping point tend to decline sharply in white population. More recently, Gechter and Tsivanidis (2017) find rapid change in neighborhoods induced through spillovers from a development program in Mumbai. The recent gentrification of central city neighborhoods across the U.S. also suggests that neighborhoods can change rapidly and dramatically in a small span of time (Baum-Snow and Hartley, 2020; Couture and Handbury, 2017; Hwang and Lin, 2016). These rapid changes in spatial structure might reflect transitions among equilibria in the context of strong spatial consumption spillovers.

The evidence on the frequency and timing of social transitions at the neighborhood scale provides another window on the scope for multiplicity in the spatial economy. There is evidence of churning and instability in distribution of types of households across neighborhoods, and dramatic transitions can happen rapidly. However, it less clear how empirical evidence on the timing and pace of neighborhood change might map to the *ad hoc* dynamics of a Schelling (1971)-style model. In addition, much of the evidence that we have on rapid neighborhood change also comes from data available only at decennial frequency.

Finally, again, there is less evidence on the speed of change at the regional scale. Spatial structure may evolve more slowly at a regional scale compared with at a neighborhood scale, perhaps owing to larger adjustment frictions, weaker spillovers, or greater importance of natural factors. The paucity of high-frequency, long-horizon data at a high-resolution regional scale has also undoubtedly held back evidence on this front.

4. Evidence from self-fulfilling expectations

Another intriguing hypothesis from spatial models featuring multiple equilibria is that self-fulfilling expectations can determine equilibrium (Krugman, 1991b; Krugman, 1993; Ottaviano, Tabuchi and Thisse, 2002). If households and businesses expect that the choices of other households and businesses will make a place attractive in the future, then they may make decisions that justify those expectations.

One example that appears to illustrate the role of self-fulling expectations is the growth of Chicago into the largest city in the U.S. Midwest. In the early 19th century, there was considerable uncertainty about which city would become the gateway to the newly opened West. Many sites were thought to be destined to host great cities. (Cronon, 1991, p. 34). The promise of Chicago was a canal linking Lake Michigan and the St. Lawrence Seaway to the Illinois and Mississippi Rivers. But there was little to distinguish the site of the future Chicago from many potential competitors in the Midwest. In fact, St. Louis at the confluence of the Missouri and Mississippi Rivers, was thought by many to have a first-nature advantage. "If waterway geography were the determinant of urban growth, the major inland city would surely be St. Louis." (p. 37). St. Louis "had been a major trade center for nearly three-quarters of a century before Chicago even became an incorporated town" (p. 296). And many other sites offered similar opportunities as the Chicago portage; for example, Toledo linked Lake Erie and the Maumee River to the Wabash and Mississippi Rivers. Even along the shores of Lake Michigan there were many other portage sites from Milwaukee to Calumet to St. Joseph (Semple, 1903, p. 29). But by 1880, Chicago had decisively overtaken all other cities in the Midwest, including St. Louis.

The early growth of Chicago exhibits some features of self-fulfilling expectations. Expectations that Chicago would grow to be an important city led people to make decisions that justified those expectations. These decisions included "second-nature" investments like the canal and the railroad but also the concentration of population and activity itself. In other words, the location of Chicago may not have been fully determined by underlying natural geography but in part by a dynamic process influenced by self-fulfilling expectations, as in the model of Krugman (1993).

At the neighborhood scale, self-fulfilling expectations appear to affect spatial structure. Hornbeck and Keniston (2017) show that following the Boston fire in 1872 property values increased in affected neighborhoods. The increase in land prices suggests that expectations of homeowners, who were able to internalize positive externalities of the quality of one building on its surroundings after the destruction, steered the local economy toward a different, higher-quality equilibrium point that then persisted.

Brinkman, Lin, and Mangum (2020) study the effects of planned highway construction on neighborhoods in U.S. cities. Many of these plans were formulated in the early 1950s but were eventually altered significantly or canceled outright in the mid-1970s (Brinkman and Lin, 2019). Interestingly, despite their cancellations, many of neighborhoods slated for urban highways declined in status through the 1950s and 1960s and remained depressed for a decade or more. These dynamics suggest that expectations might determine neighborhood status.

Overall, the evidence of self-fulfilling expectations is thinner than evidence of history dependence. This may owe to the difficulty in measuring expectations and identifying natural experiments akin to the cancellation of certain U.S. urban highway segments in the 1970s. Another possibility is that the relative importance of history versus expectations may depend on certain adjustment costs or other deep structural parameters (Krugman, 1991b). Adapting stylized models such as Krugman (1991b) to the data to better understand the importance of history versus expectations might yield important insights. These are questions where progress is hard but the rewards are potentially great.

5. Discussion and conclusions

When do localized shocks persistently change the spatial organization of the economy? The research reviewed here suggests that history (sometimes) matters for the location and sizes of cities and neighborhood segregation patterns within cities. Neighborhood change can (sometimes) be dramatic and swift. And expectations appear to (sometimes) determine spatial

structure. Taken together this implies that nature might not completely determine the spatial structure of the economy. Instead, there might be multiple possible worlds with multiple possible futures. In other words, the spatial economy might be characterized by multiple equilibria or multiple steady-state equilibria, where history and expectations can play decisive roles.

Multiplicity in spatial structure has important implications for theory and policy analysis. If there are many possible worlds—if anything could happen—then it is difficult for theory to offer useful guidance in policy analysis (Hahn, 1991). If only history matters, then we are stuck with just-so stories which may have limited external validity.

There is a growing literature quantifying general equilibrium models featuring labor mobility, trade and productivity and amenity spillovers in geographic space. Traditionally, these frameworks do not give an important role to path dependence and history (Allen and Arkolakis, 2014). Path dependence need not always imply multiple equilibria. Investments in locations can serve as sources of local advantage and ensure a unique steady-state path (Desmet and Rossi-Hansberg, 2014; Redding and Rossi-Hansberg, 2017), even when initial conditions change. In macroeconomics, shocks can contribute to steer dynamic economic systems toward unique equilibria (Frankel and Pauzner, 2000).

However, in recent years, models have expanded to directly consider the role of shocks and path dependence from a theoretical perspective. Allen and Donaldson (2020) develop a theory where today's distribution of spatial activity depends on history. They conclude that the location of economic activity in the U.S. is highly sensitive to historical shocks. At the neighborhood scale, Owens, Rossi-Hansberg, and Sarte (2020) model the urban structure of Detroit where residential externalities lead to multiple equilibria in the neighborhood development problem.

Thus, there is an opportunity to contribute to theory and policy analysis by better characterizing empirically when history matters, and when it does not. Much of the evidence reviewed in this essay has been offered in the spirit of proof of existence. That is, evidence of history dependence or self-fulfilling expectations suggests that the spatial economy might be characterized by

multiple equilibria. But evidence of existence does not necessarily provide guidance on the appropriate theoretical models to apply to welfare and policy analysis.

An important set of questions going forward is how we can better understand the conditions under which history matters. In which settings should economic geography models admit potential multiplicity? For which problems? At what spatial scales? For what size shocks? Conditioned on external knowledge about first- or second-nature factors, are there situations where we can safely ignore multiplicity? And if there is multiplicity, is there a useful model of equilibrium selection? Comparative studies of similar shocks across places, or at different spatial scales, might improve our understanding of urban and regional dynamics. A better understanding about these details would allow us to develop better theories of spatial dynamics and better analysis and design of spatial policies.

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