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Divided we fall? The effect of manufacturing decline on the social capital of US communities

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Abstract

What happens to local communities when manufacturing disappears? I examine changes in associational density over nearly two decades as a proxy for social capital in US labor markets. Exploiting plausibly exogenous trade-induced shocks to local manufacturing activity, I test whether deindustrialization is associated with greater or lower organizational membership. I uncover a robust negative relationship between the two variables, particularly acute in rural and mostly-White areas. My findings, however, are sensitive to measurement: There are no clearly discernible effects of deindustrialization on social capital when I consider alternative proxies for the outcome. To reconcile these results, I present evidence suggesting that economic adversity may induce a qualitative, rather than quantitative, change in social capital.

KEYWORDS

deindustrialization, regional labor markets, social capital

1 | INTRODUCTION

Almost two centuries ago, French political scientist Alexis de Tocqueville wrote in length about the rich community life he found on the other side of the Atlantic. He described the United States as a "nation of joiners," highlighting the virtues of associational activity and civic life for the economic success and political stability of the American democracy (Tocqueville, 1835). Today, these ideas continue to be the subject of lively discussion in social sciences. The term "social capital" was coined to broadly refer to the associational forces that underpin communities and societies.

The origins of this concept are in sociology and political science, thanks to the pioneering works of Banfield (1958), Bourdieu (1986, Chap. 9), and Coleman (1988), among others. In the sociological tradition, social capital is typically conceptualized as access to resources embedded in interpersonal networks (Portes, 1998). Political scientists extended this definition to encompass broader social structures, as a feature of entire communities, such as towns, cities, or even countries. Its collective manifestation, then, is through participation in social life, the establishment of norms of trust, cooperation, and reciprocity, as well as a general sense of civic-mindedness (Fukuyama, 2001; Putnam et al., 1993).[1] Similarly, economic geographers and regional scientists borrowed this notion to characterize certain intangible features of local communities such as informal institutions, emphasizing the territorial and historically-determined dimension of this concept (Camagni, 2004, Chap. 5, 2017; Rodríguez-Pose & Storper, 2006; Storper, 1995, 2005).[2]

At odds with Tocqueville's optimistic account, researchers recently documented a falling trend in US social capital dating back at least to the 1970s (Costa & Kahn, 2003; Putnam, 1995, 2000). Americans appear to have progressively retreated from their communities and social life. Over the same time, the United States has also witnessed a steady decrease in manufacturing employment, largely spurred by international trade pressure and technological change (Fort et al., 2018). Figure 1 illustrates these parallel declines by plotting aggregate national trends between 1975 and 2015 in the share of manufacturing employment and generalized trust, a common proxy for social capital (Glaeser et al., 2000). This stylized fact motivates my analysis. What happens to local communities when manufacturing disappears? The aim of this research is to examine changes in social capital across the US territory, with a focus on testing whether the decline of manufacturing may contribute to explaining observed dynamics.

Social scientists have studied how the industrial transformation of an economy affects communities and societies since at least the work of Polanyi (1945), who argued that the rapid economic changes experienced by eighteenth-century England during the Industrial Revolution, if not regulated, would disrupt societal cohesion. Jahoda et al. (1971) discuss the “weary community” of the industrial village of Marienthal, Austria, whose once thriving social life disappeared following the closure of its large flax-fiber factory, the town's main employer. The authors describe a general state of resignation, despair, and apathy in Marienthal. Relatedly, Turner (1996) describes the dire social consequences of heavy industry decline in the 1980s Great Britain, such as the loss of the National Union of Mineworkers, or the closing of Miners' Welfare and Institute clubs, two pillars of community life in mining areas. More recently, the outcome of the 2016 US presidential elections sparked debates focusing on the role of deindustrialization in shaping the social fabric of American communities. Some accounts describe the election of Donald Trump to US president as the result of a “revolt of the Rust Belt” (McQuarrie, 2017), highlighting the role played by economic transformation and its impact on left behind Americans across the country in securing Trump's victory (Rodríguez-Pose et al., 2021).

To investigate the relationship between deindustrialization and local community life, I first confront measurement issues: Social capital is notoriously difficult to pin down empirically (Durlauf, 2002). In keeping with Putnam and the regional science approach, I adopt an aggregate definition of this concept, as a spatially distinct feature of entire communities and the places they inhabit.[3] Consistent with this definition, I obtain several measures of social capital commonly used in the literature: associational density, carpooling, religious participation, mail responses to US Census letters, and voting turnout. I also construct an index that treats social capital as a latent

[1]According to Putnam (1995, p. 664), for instance, social capital refers to “[...] features of social life-networks, norms, and trust that enable participants to act together more effectively to pursue shared objectives.” In his later book, he describes it as: “[...] connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them [...] closely related to what some have called 'civic virtue' [...] most powerful when embedded in a dense network of reciprocal social relations” (Putnam, 2000, p. 19).

[2]This literature developed concepts intimately related to social capital, such as “relational capital,” “territorial capital,” and “untraded interdependencies.”

[3]Alternative definitions, increasingly used in economics, emphasize social capital as a feature of individuals, and interpret community social capital as some aggregate function of that belonging to individual members (Glaeser et al., 2002). A related literature interprets social capital as simply capturing interpersonal networks and their structure (e.g., Dasgupta, 2005; Jackson, 2020; Lin, 2001, Chap. 1).

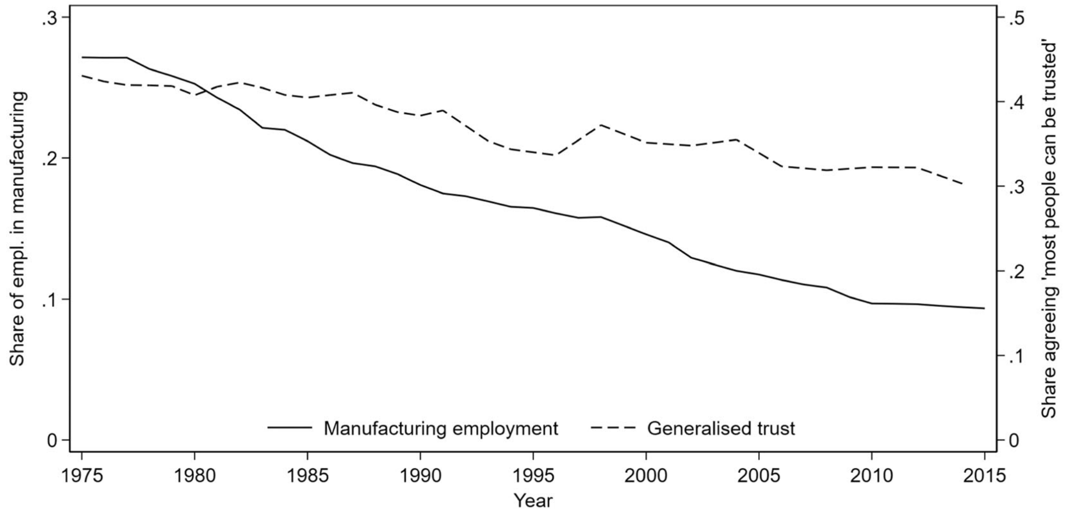

FIGURE 1 Share of US employment in manufacturing (NAICS codes 31–33) on the left axis, and proportion of respondents who agree that "most people can be trusted" on the right axis, 1975–2015 (3-year moving average smoothing applied to observations in the trust variable before 1980). *Sources*: Eckert et al. (2020) and OECD (2017) based on data from the General Social Survey. NAICS, North American Industrial Classification System.

construct captured by several different proxies. I discuss variation in all these variables in both time and space. I uncover a complex geography of social capital both in level and trends, which underscores measurement challenges (Chetty et al., 2022a) and the spatially-sensitive nature of this concept emphasized in the regional science literature (Beugelsdijk & Van Schaik, 2005; Fazio & Lavecchia, 2013; Iyer et al., 2005). I also find that several measures confute Putnam's claim of monotonic social capital decline: Stocks decreased before the turn of the century, but subsequently increased to levels higher than in 1990.

Next, I rely on the empirical approach of Autor et al. (2013a) to investigate the role of manufacturing decline in determining changes in social capital across US communities. I exploit variation in exposure to trade shocks across industries and local labor markets due to import penetration from China to isolate plausibly exogenous changes in local demand for manufacturing jobs. This method is well established in the literature, and allows me to interpret the effects I identify in a causal way.[4] Of the measures I consider, I prioritize associational density as the one most faithful to Putnam's understanding of social capital, which emphasizes participation in communities and organizational membership. I also consider the sensitivity of my findings to alternative outcome measures. I detect a robust negative effect of deindustrialization on participation in associational life, particularly acute in White rural communities. This finding, however, is sensitive to how I define social capital empirically. Alternative measures display no statistically significant association, or even a positive one. To reconcile these apparent incongruous results, I uncover evidence suggesting that rather than quantity, economic adversity may have induced a qualitative change in social capital. As associational life subsides, economic hardship promotes solidarity among community members. I document an increase in participation to the delivery of community assistance services to the needy, such as temporary housing and shelter, food banks and kitchen soups, and vocational training.

My analysis contributes to three different strands of literature. First, I dialog with research on the determinants of social capital formation, exploring the role of deindustrialization. A large scholarship from a variety of disciplines documents the relevance of social capital for socioeconomic outcomes at both national and regional

[4]One drawback, however, is that it only focuses on one determinant of deindustrialization, trade shocks. See Section 2.3 for a discussion of different sources of manufacturing decline, and a justification of my choice to focus on trade.

levels (Durlauf & Fafchamps, 2005, Chap. 26).[5] Less is known about what contributes to the accumulation or depletion of social capital over time, or its dispersion in space. Two important exceptions with respect to geographical variation come from the regional science literature. Work by Iyer et al. (2005) on the United States and by Beugelsdijk and Van Schaik (2005) on Europe documents the large regional heterogeneity of social capital along several dimensions. Indeed, space plays an important role in the production of social capital, as measures of trust are found to cluster geographically with a high degree of historical persistence (Fazio & Lavecchia, 2013). Iyer et al. (2005) emphasize differences in educational attainment, incomes, mobility, age structure, urbanization, and ethnic composition as key observable drivers, but also mention significant residual variation due to unobserved characteristics of places. Another important work on the geography of social capital and its production is by Rupasingha et al. (2006), who map out variation across counties in associational density and a comprehensive index of social capital. Ethnic composition, income inequality, mobility, education, age, and female labor force participation are confirmed to be important predictors of cross-sectional variation in social capital stocks. Both studies rely on a small microlevel literature that theorizes economic incentives influencing agents' decision to invest in social capital, which I review in Section 2.1.

Related to this scholarship, I also contribute to a literature on social capital dynamics revolving around Putnam's argument that US social capital is in steady decline (Putnam, 1995, 2000). I map out changes in several proxies of social capital over time, and offer descriptive evidence that questions this claim. Several papers have previously engaged in this debate, with mixed results. Paxton (1999) examines various indicators of social capital in the United States over two decades, finding a moderate decrease in a general index measure, as well as falling levels of individual trust. Yet trust in institutions and participation to associations do not seem to have receded. The author emphasizes that to fully understand changes in American communities, it is important to study the dynamics of dispersion in social capital, not just its aggregate stocks, which is where geography can offer a valuable contribution. Costa and Kahn (2003) study changes in social capital since the 1950s, focusing on the residential dimension of this concept, that is to say, the community of family and friends formed outside the workplace within the private sphere of one's life. They distinguish between social capital produced within home through meetings with friends and family, and one generated outside home thanks to organizational membership or volunteering activity. Their findings suggest that, once education is controlled for, women's growing participation to the workforce predicts changes in social capital produced at home, while income inequality and community heterogeneity more in general explain the losses of social capital formed outside the home environment.

Finally, this paper also extends the literature on the societal effects of manufacturing decline, particularly those induced by trade shocks. Several studies document the adverse consequences linked to deindustrialization. Autor et al. (2013a, 2014) emphasize economic outcomes, notably wages, employment, and public-transfers. Autor and Dorn (2013) consider the distributional implications of a shift towards service jobs, associated with skill-biased technological change and the loss of middle-income job opportunities in the tradable sector. They find that tertiarization leads to occupational and wage polarization. Deindustrialization has also been associated with lower R&D, loss of local know-how and specialized workforce, and stifled innovation (Autor, Dorn, Hanson, Pisano, et al., 2020; Gibson, 2014; Pisano & Shih, 2009, 2012). This can impinge on the adaptability and resilience of local economies. The provision of public goods also falls, as local public finances deteriorate due to declines in incomes and housing values (Feler & Senses, 2017). More recently, rising import competition has been associated with a rise in political polarization (Autor, Dorn, Hanson, & Majlesi, 2020), and changes in marriages and fertility rates (Autor et al., 2019). The latter study is particularly relevant as it documents the effect of manufacturing on families, perhaps the primordial social unit. It shows that young men exposed to trade shocks see a decrease in their value on the marriage market, as they are at greater risk of idleness, drug and alcohol abuse, and premature mortality. Overall, this lowers marriages and increases the share of unwed mothers and of children in

[5]Without aiming for a comprehensive review, and ignoring individual-level or network-based approaches, social capital has been associated with growth and economic development (Algan & Cahuc, 2010; Andini & Andini, 2019; Beugelsdijk & Van Schaik, 2005; De Blasio & Nuzzo, 2010; Knack & Keefer, 1997; Tabellini, 2010; Zak & Knack, 2001), human capital (Coleman, 1988), government quality (Knack, 2002), financial development (Guiso et al., 2004), geographical mobility (David et al., 2010; Kan, 2007), innovation, productivity, and entrepreneurship (Akçomak & ter Weel, 2009; Crescenzi et al., 2013; Echebarria & Barrutia, 2013; Ganau & Rodríguez-Pose, 2023; Murphy et al., 2015; Percoco, 2012, 2015), economic mobility (Chetty et al., 2022a), crime (Akçomak & ter Weel, 2012; Lederman et al., 2002; Rosenfeld et al., 2001), and labor market networks (Asquith et al., 2021).

single-head households. Putnam himself expresses "[…] no doubt that global economic transformations are having an important impact on community life across America" (Putnam, 2000, p. 274), yet he does not explore this channel empirically. By studying changes in the strength of community participation across US communities, I add to this scholarship with evidence on a previously ignored yet arguably very relevant outcome.[6]

The remainder of this paper is structured as follows. I frame my analysis conceptually in Section 2, where I review theoretical work on the determinants of social capital formation, and argue on this basis how manufacturing decline matters for social capital. Sections 3 and 4 present empirical methods and discuss results. Section 5 concludes.

2 | CONCEPTUAL FRAMEWORK

2.1 | Determinants of social capital formation

Understanding the determinants of social capital formation is necessary to formulate hypotheses as to what role manufacturing decline might play in explaining the observed trends. It also helps think about possible confounding factors one might wish to control for in the empirical analysis. Despite my adoption of an aggregate definition of social capital, communities are not decision makers so I draw on the individual-level literature to discuss the economic incentives underlying accumulation or depletion.[7] Glaeser et al. (2002) offer a seminal contribution to this literature, developing a model of investments in social capital akin to what is done in theories of physical and human capital. Their comparative statics suggest that social capital accumulation depends on income, proximity, mobility, homeownership, education, age, and occupation. I offer further details below.

Income

Income plays an important role in social capital, as it determines the opportunity cost of time. Participation to community organizations and civic engagement can be regarded as a decision on the allocation of time between work and leisure (Becker, 1965). Involvement in such activities, therefore, is costlier for high-earning individuals, thus potentially less desirable. Higher wages, however, also increase the disposable income that can be spent on leisure. Moreover, there is a sense in which this consumption can be "productive" (Becker, 1965). Business lunches, for instance, contribute to both work and leisure, yielding a return. Consequently, the overall effect of income is ambiguous. As wages rise, direct and indirect income effects might prevail over foregone earnings, inducing an increase in time dedicated to socialization and community participation. In addition to individual income, Becker (1974) also introduces the concept of "social income." This comprises one's own, as well as that of individuals one cares about. This social income therefore can be spent on own consumption or on transfers to influence the consumption of others in the group.[8] The existence of social income and of interdependent utility preferences offers a rationale for charitable giving or community engagement.

Spatial proximity

Interacting is cheaper when peers or meeting places are geographically closer, due to lower commuting costs. Proximity also increases the frequency and spontaneity of interactions, cumulatively lowering coordination costs.

[6]To the best of my knowledge, Miguel et al. (2006) is the only other study considering the relationship between manufacturing and social capital, documenting a positive association. However, the paper focuses on the rapid industrialization of Indonesia, so its findings refer to a process and a context very different from the American one.

[7]Nevertheless, I also note that the aggregate realization of social capital can differ from the simple sum of that belonging to individuals, due to the presence of interaction externalities (Glaeser et al., 2002).

[8]To illustrate, consider the example of a family. In a couple, one's utility depends in part also on the welfare of his or her partner or spouse. In this case, assuming there is no cost in transferring resources across family members, the social income is effectively given by the sum of the couple's incomes, and contributions to the social environment can be regarded as monetary transfers to support the partner's consumption. This example can be extended more generally to the case where someone's utility depends on the welfare of anyone in a group of people the individual cares about (e.g., neighbors).

By extension, population density should promote social capital accumulation, while sprawl should reduce it (Putnam, 1995, 2000). However, population density may also increase anonymity, alternative uses of time, and a desire for privacy, discouraging social capital accumulation (Brueckner & Largey, 2008). This conclusion is also supported in Glaeser and Gottlieb (2006), who find no effect of sprawl on civic engagement, which on the contrary appears to rise in suburban landscapes.

Geographic mobility and homeownership

Geographical mobility deters the accumulation of social capital as this depreciates with distance. Individuals who expect to relocate, therefore, are less inclined to engage with their local community (David et al., 2010). By constraining mobility, homeownership raises the gains from social capital developed in the neighborhood, as local networks generate positive externalities. Homeowners, thus, are said to be "better citizens" due to the incentives they face to invest in neighborhood relations (DiPasquale & Glaeser, 1999). On the other hand, new entrants to the neighborhood, or churn, may dilute locally accumulated social capital and discourage further investments (Hilber, 2010).

Education

Coleman (1988) famously discussed the links between human and social capital. Several other studies document a positive association between these two forms of capital, though it is difficult to establish the direction of causality (Glaeser et al., 2002). One interpretation is that the same underlying preference to investment in human capital, patience, also generates the accumulation of social capital, as individuals value future benefits relatively more. Another explanation is that school teaches social skills valuable for social capital investments. Or there could be complementarities: Individuals with higher levels of education benefit more from social connections than those who are less educated. Finally, schools are also places of socialization, and the quality of resources available in one's network is mediated by contact opportunities. Due to sorting in schools by socioeconomic background, then, higher educated individuals are more likely to have been exposed to more conducive peers, generating higher social capital. Chetty et al. (2022b) show that about half the variation in economic connectedness, a measure of social capital they develop, is explained by differences in exposure to conducive ties in group settings, such as schools.

Other determinants

Life cycle considerations also matter for social capital accumulation. Agents are more inclined to invest in social capital in the earlier stages of their life, as they will reap the returns on investment over a longer time. As they age, the cost of investing exceeds the benefits they draw, discouraging further accumulation. Occupational category matters too, because agents whose job offers a higher return on social skills, such as certain service jobs, will find it profitable to invest in social capital. Finally, because social capital arises from interactions between individuals, it is more likely to be observed when relational costs are lower. As "similarity breeds connection" (McPherson et al., 2001), differences in characteristics, such as race, ethnicity, education, or income—reflecting some unobserved underlying friction to social exchange—may hinder social capital accumulation (Charles & Kline, 2006). This is also true on aggregate. Alesina and La Ferrara (2000) argue that group heterogeneity, such as income inequality or ethnic and racial fractionalization, reduces group participation and thus erodes social capital.

2.2 | Mechanisms linking deindustrialization to social capital

In light of the theories reviewed above, why and how might deindustrialization affect social capital? As in Miguel et al. (2006), my econometric model focuses on the reduced-form effect of deindustrialization on social capital, not attempting to separately identify the causal effect of each possible mechanism. However, laying down the groundwork for my empirical analysis, it is still useful to trace out conceptually the different ways in which manufacturing decline may influence social capital in America.[9]

First, a reorientation of the economy towards service jobs, where social skills are more valuable, may in and of itself lead to an increase in social capital. However, this is only true if transitions from manufacturing jobs to such occupations are sufficiently frequent. While it is generally true that the service sector underwent a general expansion in relative terms (Autor & Dorn, 2013; Autor et al., 2013a), this may be due to fewer jobs in manufacturing rather than more jobs in services, particularly in areas exposed intensely to trade shocks, with little change in overall incentives for social capital accumulation.

Second, manufacturing decline might influence social capital accumulation by reducing earnings, via changes in income and unemployment or nonemployment (Autor et al., 2013a, 2014).[10] If community engagement is a normal good with productive consumption features, then we might expect social capital to fall as manufacturing declines. Similarly, income loss may require households to take on extra work, reducing the time available for socialization and social capital production.

Third, Becker's notion of social income and of socially interdependent preferences may result in a kind of "social insurance" effect (Becker, 1974), whereby members of a group increase their contributions to others when these are affected by some unexpected disaster. If social capital captures efforts by a community to provide support to its members, then a negative economic shock might result in its accumulation, rather than depletion. Thus, manufacturing decline may increase the dependency on one's local community for various services in the form of a reciprocal exchange of favors and support. In this context, social sanctions have greater bite and individuals may be less inclined to engage in antisocial behavior. Community ties may thus grow stronger as individuals tap more into their social support system and establish norms of solidarity and reciprocity.[11]

Fourth, because shocks to the manufacturing sector have a distinct geographic profile (Autor et al., 2013b), social capital might be affected through population mobility or due to rising inequalities within and across local labor markets (Autor & Dorn, 2013). In the former case, it is possible that workers partly adjust to changes in their economic environment by relocating to other local labor markets unaffected by the shock. Population churn might then cause social capital to fall due to community ties being broken (in case of outflows, see Glaeser et al., 2002), or because newcomers dilute existing systems of support (in case of inflows, see Hilber, 2010). In practice, however, market adjustments through the channel of labor mobility tend to be limited, at least in the short and medium terms (Autor et al., 2013a; Blanchard et al., 1992).[12] With respect to inequality, community participation might decrease if manufacturing decline raises socioeconomic divides within each local labor market, as discussed in Alesina and La Ferrara (2000). However, if deindustrialization disproportionately raises inequality across, rather than within, labor markets, resentment among those negatively affected by unequal earnings may constitute a bond of its own, generating an increase in local social capital. This is more likely if exposure to trade shocks is geographically concentrated (Autor et al., 2013b).

2.3 | A note on the sources of manufacturing decline

The decline of US manufacturing employment has several underlying causes. While it is difficult to isolate each driver empirically, trade and technology are typically mentioned as capturing the lion's share of this decline on the supply side (Fort et al., 2018). The former stems from the rising cost of labor in advanced economies, which makes production and import of goods in low-income countries relatively more convenient, particularly as barriers to trade

[9]I also come back to mechanisms in Section 4.4, where I explore correlations to paint a descriptive picture.

[10]To simplify, unemployment and nonemployment can simply be thought of as extreme income losses.

[11]It is also theoretically possible that lower incomes reduce the opportunity cost of time spent working, inducing individuals to interact more with each other. This effect would be observationally equivalent, though I argue unlikely to matter much in practice.

[12]This is consistent with a general decline in the geographic mobility of US workers (Molloy et al., 2011).

fall. Technological progress, instead, allows manufacturers to substitute labor with capital, automating production processes. Other forces, however, may also contribute to this decline. In particular, emphasizing demand-side considerations, there is a scholarship that documents a shift in consumer preferences towards services as an economy develops (e.g., Bell, 1976; Kongsamut et al., 2001; Schettkat & Yocarini, 2006; Vu et al., 2021).

This paper considers manufacturing decline originating from trade shocks as its main source of variation. It does so for two reasons. First, Autor et al. (2015) document that international trade pressure in general, and Chinese import competition in particular, are the main drivers of income and employment loss in manufacturing. Automation, instead, is associated with a polarization of occupations and wages within sectors, with little effect on overall employment or nonemployment (Autor & Dorn, 2013). It is thus less relevant from the point of view of this analysis. Second, focusing on trade-induced deindustrialization allows me to rely on the identification strategy developed in Autor et al. (2013a). This method is well established in the literature, enabling me to make causal claims. Its drawback, however, is that it ignores other drivers such as changes in production technology, or a shift in consumer preferences. Because of the significant identification challenges involved, however, the arduous task of discussing the effect of deindustrialization due to other drivers falls outside the scope of this paper.

3 | EMPIRICAL STRATEGY

This paper considers the effects of manufacturing decline on social capital across the United States. I examine changes taking place over nearly two decades between 1990 and 2007. The choice of period is bounded on one end by data availability, and on the other end by the occurrence of the Great Recession of 2008. This large shock likely affected both manufacturing and social capital independently from the relationship under study. The geographical unit of analysis is 722 continental US commuting zones (CZs), formed by combining counties in such a way that they capture local labor markets (Tolbert & Sizer, 1996). Since this analysis relies on spatially aggregated information, it is potentially subject to bias due to the Modifiable Areal Unit Problem (Briant et al., 2010; Openshaw & Taylor, 1979). The nature of CZs, which are designed to encompass the majority of daily flows of people between residence and workplace, mitigates such concerns. It also helps think of the individuals living within their boundaries as belonging to the same community. Below, I discuss more in detail the measurement of key variables of interest, and the econometric strategy.

3.1 | Measuring social capital

3.1.1 | Main measure

Social capital is notoriously difficult to measure. Scholars have proposed several approaches, each with its merits and drawbacks. In this paper, I focus on organizational membership, proxied by associational density, as the preferred proxy for social capital (Glaeser et al., 2002). It is defined as the count of establishments per 10,000 capita of community organizations, such as civic and social associations, sport, recreation and bowling centers, religious, political and professional organizations, and membership clubs. This metric captures manifestations of social capital pertaining to the behavior of individuals who participate in local associational activities. It has several important advantages. First, it is coherent with the work of Putnam, whose concept of social capital and empirical claims underscore this analysis. Second, it has been widely adopted in previous work,[13] thus facilitating comparability thanks to methodological consistency. Third, associational density can be computed using high-quality information

[13]See, for instance, Putnam et al. (1993), Putnam (2000), Glaeser et al. (2002), Beugelsdijk and Van Schaik (2005), Rupasingha et al. (2006), De Blasio and Nuzzo (2010), Satyanath et al. (2017), and Asquith et al. (2021).

available consistently over a long time-span. Finally, the measure lends itself well to a simple and intuitive interpretation of social capital as organizational membership and participation in community activities.

Data on the number of associations in each CZ are obtained for the years 1990, 2000, and 2007 from the County Business Patterns database (CBP), which gives the number of establishments by North American Industrial Classification System (NAICS) or, before 1997, by Standard Industrial Classification codes. Relevant NAICS codes are defined in line with Rupasingha et al. (2006). They are chosen at the four-digit level and cover: amusement and recreation industries (7139)[14]; religious organizations (8131); civil and social organizations (8134), such as parent–teacher associations, social clubs, alumni groups, and scouts; and "lobby" organizations, such as business, professional, political, and labor organizations, including trade unions (8139). Consistency in the coding of industries over the years was ensured. For 1990 industry cells, which are defined according to SIC codes, I use the weighted cross-walk provided by Eckert et al. (2020) to obtain establishment counts that are comparable over time.

3.1.2 | Alternative measures

Wary of the difficulty of capturing the complexity of social capital with one unique measure (Chetty et al., 2022a), I evaluate how sensitive my analysis is to alternative variables used in the literature. The other variables I consider are carpooling rates, adherence rate to religious organizations (of all faiths and denominations), mail response rates to US Census letters, and turnout to presidential elections.[15] In several ways, these measures capture certain aspects of human behavior that pertain to social capital. However, there are certainly other driving forces behind them that are unrelated to this concept. For instance, there is a rich political science literature that examines the behavior associated with turning out to vote (e.g., Dhillon & Peralta, 2002; Geys, 2006), where social capital and related notions are rarely emphasized.[16] Therefore, I argue that these other measures are less straightforward to interpret than associational density. Below, I discuss each more in detail, emphasizing why it is still suitable as an alternative metric.

Carpooling is a good alternative proxy for social capital: It is an informal type of organization that requires active interaction among its members, mutual trust in timeliness, reliability, and driving competence, and is spatially embedded in local neighborhood relations (Alrasheed, 2019; Charles & Kline, 2006). Conveniently, it is also measured regularly in decadal US Censuses, ensuring representativeness at the geographical level I study. I obtain measures of carpooling from the National Historical Geographic Information System (NHGIS) project (Manson et al., 2022) for the years 1990, 2000, and 2010. I restrict the definition of carpooling to groups of three commuters or more, to avoid capturing spouses and partners within the same household. I scale this measure either per 10,000 residents, or per 10,000 workers. The latter allows one to take into account changes in labor force participation induced by deindustrialization.

Religious participation complements the measure of associational density in that it directly accounts for the number of people active in religious organizations, rather than simply counting religious establishments (Putnam, 2000). Moreover, religious organizations offer exposure to people with different socioeconomic backgrounds, and are found to mitigate friending bias by fostering interactions with potentially more conducive peers (Chetty et al., 2022b). Religious participation is measured using data on adherence to congregations of all faiths, collected by the Association of Statisticians of American Religious Bodies and distributed by the Association of Religion Data Archives. These data give the total number of adherents to congregations affiliated with 149

[14]This category includes golf courses, country clubs, marinas, fitness and recreational sports centers, bowling centers, and other similar recreational establishments.

[15]All variables are observed for counties and aggregated to CZs by collapsing counts at this level before scaling by total CZ population (or other relevant denominator as specified for each variable). The only exception is the rate of response to US Census letters, which is available as a proportion only. In this case, I obtain CZ aggregates using population-weighted averages.

[16]Turnout was even found to be influenced by adverse weather conditions, such as rainfall, which certainly is not related to social capital (Fujiwara et al., 2016). As my empirical analysis is specified in the first differences, transitory place-specific shocks of this kind can add a lot of noise to the outcome.

religious bodies of Christian as well as other faiths for each county in the United States in 1990, 2000, and 2010. Rates are expressed in terms of 100 capita.

Rates of response to US Census letters can be interpreted as a measure of civic-mindedness and cooperation, revealed in the behavior of citizens who provide a public good (Knack, 2002). This comprehensive measure is available for nearly all counties in the United States and for all three Censuses relevant to the period I study.[17] Similarly to Census mail-back rates, voting also represents an act of civic duty and engagement with the American community and its democratic values. In this spirit, turnout to presidential elections has been frequently used as a proxy for social capital in the literature (e.g., Alesina & La Ferrara, 2000; De Blasio & Nuzzo, 2010; Guiso et al., 2004; Putnam et al., 1993). I use the average turnout to 1988 and 1992 elections for 1990, and to 2008 elections for 2007. Turnout data was obtained from ICPSR (2013), Rupasingha et al. (2006), and MIT Election Data and Science Lab (2018). The number of voters in each election was normalized by the count of residents aged 18 or more in the election year.

3.1.3 | Social capital index

In addition to considering these variables separately, I also construct an index for social capital at the level of local labor markets using principal component analysis (PCA). This strategy is common in the social capital literature (e.g., Akçomak & ter Weel, 2012; Beugelsdijk & Van Schaik, 2005; Rosenfeld et al., 2001; Rupasingha et al., 2006) In so doing, I acknowledge that social capital is ultimately a composite, multifaceted, construct, difficult to pin-down empirically with a unique variable. This, however, comes at the cost of interpretability, which is why in my main analysis I favor associational density as the preferred proxy. Similar to Rupasingha et al. (2006), I consider associational density and religious participation, Census response rates, and voting turnout for the index. Before performing the PCA, each variable is standardized using the average and standard deviation in 1990, to avoid excessive loading of those with higher variance, while also allowing to assess changes over the years with respect to the distribution at the initial time point (Mazziotta & Pareto, 2016; Nardo et al., 2008). The index itself is computed as the scores from the first component, which explains nearly half of the total variance across the variables over 1990–2007. To prevent possible outliers from driving empirical results, the top and bottom 1% values of the index are trimmed and replaced with those at the first and 99th percentiles. Each year's index is also rescaled using the min–max method across all available years, and multiplied by a factor of 100, so as to allow capturing changes over time and to ease interpretation (Mazziotta & Pareto, 2016; Nardo et al., 2008). The resulting index is bounded between 0 and 100.[18]

3.2 | Local shocks to manufacturing

Local labor market shocks to the manufacturing sector are measured as the change in the exposure of each CZ to import penetration from China. For each CZ i and industry j, the changing exposure to Chinese imports at time t is given by

$$\Delta IP_{i,t}^{US} = \sum_{j} \frac{L_{ij,t}}{L_{j,t}} \times \frac{\Delta M_{j,t}^{US}}{L_{i,t}}. \tag{1}$$

[17]A few observations are missing in 1990. I impute these in two steps: First, I compute the 1990–2000 growth in mail-back rates in neighboring counties within the same CZ, and impute missing cells using the value implied by this growth rate and the 2000 level. Second, for counties in CZs with all missing observations, I assign the state average in the same year, as in Rupasingha et al. (2006). Because missing observations tend to be spatially clustered in a few states, I keep track of imputed values with a dummy indicator at the CZ level that is controlled for in all regressions involving this variable.

[18]Supporting Information Appendix Tables A.1, A.2, and A.3 give information on Pearson's correlation coefficients for all variables used in the index, as well as details on principal components, such as their loadings, correlations with each index variable, and the proportion of explained variance.

This measure mimics a traditional shift-share variable by assigning to local labor markets the change in overall imports $M^{US}_{j,t}$ from China to the United States in industry j in proportion to their share of national employment in that same industry (Bartik, 1991; Blanchard et al., 1992). I consider differences over 1990–2000 and 2000–2007. During this time, the United States experienced a more than tenfold increase in imports from China, a sizeable change compared with imports from other low-income countries, and much larger than the corresponding increases in US exports (Autor et al., 2013a). This reflects the fact that over this period Chinese manufacturing saw a dramatic rise in competitiveness, owing to the country's progressive transition to market–economy combined with growing openness to trade and accession to the World Trade Organization (WTO) in 2001. This sharp increase represents the supply-driven shock to US manufacturing exploited in this analysis. Because the distribution of shocks is right skewed, similar to what is done with social capital I recode the top 1% of values with those at the 99th percentile to prevent outliers from influencing the results.

The information on trade shocks and related variables in this paper is the same one underlying the analysis of Autor et al. (2013a), from where I source these data. Originally, the authors obtained information on imports from the UN Comtrade Database, available consistently for many high-income countries at six-digits Harmonized System product level from 1991 onwards.[19] Information on local industrial employment composition is obtained from the 1990 and 2000 CBP databases, which along with establishment counts also tabulate employment, firm size class, and payroll for US counties and industries.[20] All county figures are aggregated to the CZ level. Import penetration is expressed in terms of thousands of dollars per worker at 2007 prices.

3.3 | Baseline model specification

Econometrically, the relationship between local exposure to import penetration from China and social capital can be described using a model of this form:

$$\Delta SOC_{i,t} = \beta \Delta IP^{US}_{i,t} + \mathbf{X}'_{i,t}\gamma + \theta_t + \epsilon_{i,t}. \tag{2}$$

Where $\Delta SOC_{i,t}$ is the change in a measure of social capital in CZ i over the decade starting at time t, $\Delta IP^{US}_{i,t}$ is the measure of import penetration from China, and $\mathbf{X}_{i,t}$ is a vector of controls for start-of-period socioeconomic CZ characteristics, which might influence social capital accumulation independently from the shocks to manufacturing. My choice of controls is based on the discussion in Section 2.1. Among others, I consider population density and rates of homeownership, college education, or elderly (ages 65 or older) in the population.[21] Note that cross-sectional variation in import penetration for each CZ is driven both by the local structure of employment, whether manufacturing or nonmanufacturing, and from the local industrial composition within manufacturing activities at the start of each period. Following Autor et al. (2013a), therefore, my preferred specification includes a control for the overall share of manufacturing jobs at the start of each period in the vector $\mathbf{X}_{i,t}$, so as to narrow the source of variation to import penetration exposure that is due to local specialization patterns *within* manufacturing. This is the margin that can more plausibly be argued to be exogenous once instrumented, as I explain below.

Equation (2) also absorbs a period dummy θ_t indicating whether differences are taken over 1990–2000 or 2000–2007,[22] and fixed effects for nine Census divisions to absorb any trend in social capital at these levels.

[19]The matching of these data to US industry codes is described in the Supporting Information Appendix to Autor et al. (2013a), available at https://www.aeaweb.org/articles?id=10.1257/aer.103.6.2121.

[20]The aforementioned Supporting Information Appendix to Autor et al. (2013a) also discusses the methodology used to impute missing employment figures for small establishments.

[21]All control variables are measured using data from the USA Integrated Public Use Microdata Series by Ruggles et al. (2020), or US Decennial Censuses, obtained from the NHGIS project (Manson et al., 2022).

[22]All changes for the 2000–2007 period are expressed in 10-year equivalents, obtained by multiplying differences by a factor of 10/7, which allows like-for-like comparison of effects over the two periods.

To account for the potential spatial correlation of errors, the residual term $\epsilon_{i,t}$ is always clustered by state. If decade-equivalent changes are considered individually, my estimating equation is essentially a two-period fixed effects regression, as the key variables of interest are expressed in first differences. When examining long changes over 1990–2007, the resulting stacked first differences model mimics a three-period fixed effects regression with looser assumptions on the serial correlation of the error term, as pointed out by Autor et al. (2013a), who rely on a similar specification.

3.4 | Identification strategy

The main coefficient of interest in this analysis is β. However, there are several possible sources of bias. First, the increase in Chinese imports may be related to unobserved domestic shocks that also independently affect social capital. For instance, rising import penetration may be related to changes in US product demand and consumer preferences, sluggish productivity growth in the US industry, or technology shocks specific to the US and high-income countries that favor less labor-intensive industries by sheltering them from international competition (e.g., automation). Second, and importantly, it is also possible that it is changes in local social capital driving changes in local manufacturing performance, rather than the other way around, which is in turn reflected in the growth of imports from China. This is essentially a story about reverse causality, which cannot be easily dismissed especially because the measure of exposure to trade shocks is apportioned to each CZ using the structure of manufacturing jobs at the beginning of the same period over which changes to social capital are defined. Stronger social cohesion may promote industrialization due to trust, norms of reciprocity, or enhanced entrepreneurship. Conversely, it is also possible that social networks foster rent-seeking behavior leading to manufacturing losses due to conflicts in bargaining among workers and firms.[23]

It is very difficult to fully discount these alternative stories. However, I rely on an instrumental variable strategy to make some way forward in the causal identification of the effect of supply-driven shocks to manufacturing on social capital. The strategy, which parallels that in Autor et al. (2013a), attempts to isolate the supply-driven variation in trade shocks from China by considering growth in imports per worker from the same origin to other high-income countries over the same period, rather than to the United States.[24] In addition these imports are attributed to CZs using the structure of local industrial employment in the decade before the period considered. This mitigates issues of reverse causality, assuming there is no strong serial correlation in unobserved CZ shocks which simultaneously determine local industry structure and social capital (Faggio & Overman, 2014). More formally, the instrument is obtained as[25]

$$\Delta IP^{IV}_{i,t} = \sum_j \frac{L_{ij,t-1}}{L_{j,t-1}} \times \frac{\Delta M^{IV}_{j,t}}{L_{i,t-1}}. \quad (3)$$

The model in Equation (2) is then estimated with Two Stage Least Squares (2SLS) using $\Delta IP^{IV}_{i,t}$ in the first stage to predict $\Delta IP^{US}_{i,t}$, conditional on the same set of controls and fixed effects as in the second stage. The identifying assumption is that the variation common to imports by the US and other high-income countries reflects changes that are specific to China, notably its high productivity growth and rapid erosion of trade barriers. The exclusion restriction, then, requires that supply-driven import pressure from China does not determine changes in social capital in any other way but through its effect on the local manufacturing sector.

[23] The literature has not reached a firm conclusion yet on this question (see Rodríguez-Pose & Storper, 2006, for a comprehensive discussion), but either of these effects represents a threat to identification.

[24] These are Australia, Denmark, Finland, Germany, Japan, New Zealand, Spain, and Switzerland, for which comparable trade data was available.

[25] Consistently with what done with US trade shocks, I recode the top 1% of values with those at the 99th percentile.

4 | RESULTS AND DISCUSSION

4.1 | Social capital over time and space

I begin the discussion of my findings by highlighting some descriptive facts about the key variables of interest, as a way to contextualize the econometric analysis. Figure 2 offers an overview of social capital according to the different measures I propose. I break down averages by year and Census divisions to examine geographic heterogeneity in levels and trends. There are two noteworthy patterns in the data. First, in any given year, stocks of social capital vary significantly across space. With some exceptions, levels tend to be highest in the Midwest (West and East North Central divisions), confirming existing accounts (e.g., Rupasingha et al., 2006). The West North Central area, in particular, stands out for its high associational density throughout the period of study (panel a). The South region and Pacific division, instead, show the lowest density. Conversely, carpooling and religious participation (panels b and c) are especially high in the South (West and East South Central, and South Atlantic), while New England leads in voting turnout (panel e). These places display relatively low levels of social capital otherwise, based on alternative empirical definitions. This disparate geography confirms the importance of relying on different measures of social capital to fully account for the complexity of this concept (Chetty et al., 2022a; Portes, 1998).

Second, Figure 2 makes clear that social capital dynamics are highly heterogeneous too. Production and depletion of stocks vary greatly by place and measure. Trends are not necessarily monotonic either. Associational density, for instance, increased in most areas between 1990 and 2000, but plateaued or even decreased over the following years (panel a). A persistent upward trend is only observed in the western parts of the Midwest. Conversely, carpooling and religious participation displayed opposite trends, decreasing sharply on average in many places (panels b and c). Census mail response rates and turnout to presidential elections showed more varied dynamics, tending to fall before the turn of the century, and increasing after that (panels d and e). Sometimes, levels in 2007 were higher than in 1990. This is generally true for Census mail responses, and in the Mid and South Atlantic, East North Central, and East South Central divisions for turnout. Elsewhere, like in the West North Central, West South Central divisions, and the West, voting turnout was lower in 2007 than in 1990.

In both levels and trends, the social capital index (panel f) picks up a combination of these patterns. It is remarkably high in the West North Central division, and lowest in the South Atlantic and Pacific. Social capital decreased on average by about five index points between 1990 and 2000, and increased by over twice this amount during the subsequent 7 years. Both differences are statistically significant at the highest conventional levels of confidence. I can also reject the hypothesis that the long-term change between 1990 and 2007 is zero, confirming a net increase until before the Great Recession. The claim that social capital is in steady decline, therefore, is not fully supported in the data, at least not since after Putnam published his research.

Since this analysis focuses on dynamics, I draw maps for decade-equivalent changes in the main variables of interest. The geographic profile of social capital accumulation or depletion, as proxied by associational density, is visualized in panel a of Figure 3, while that for US import penetration from China is in panel b. I do this separately for changes over 1990–2000 and over 2000–2007.[26] In all maps, polygons in blue denote quartiles of positive differences, while those in red are quartiles of negative differences. I always consider the distribution of changes in both periods, so that dynamics can be visually compared across maps. Figure 3 highlights the rise and fall of associational density over the two decades I consider, and the near monotonic increase in exposure of local markets to the Chinese trade shock. Almost all US communities face rising import penetration, which is particularly pronounced after the turn of the century when China joined the WTO. Visually comparing the two maps, there appears to be a negative association between local shocks to manufacturing and social capital accumulation, with

[26]Maps for changes in alternative measures of social capital are in Supporting Information Appendix Figure A.1.

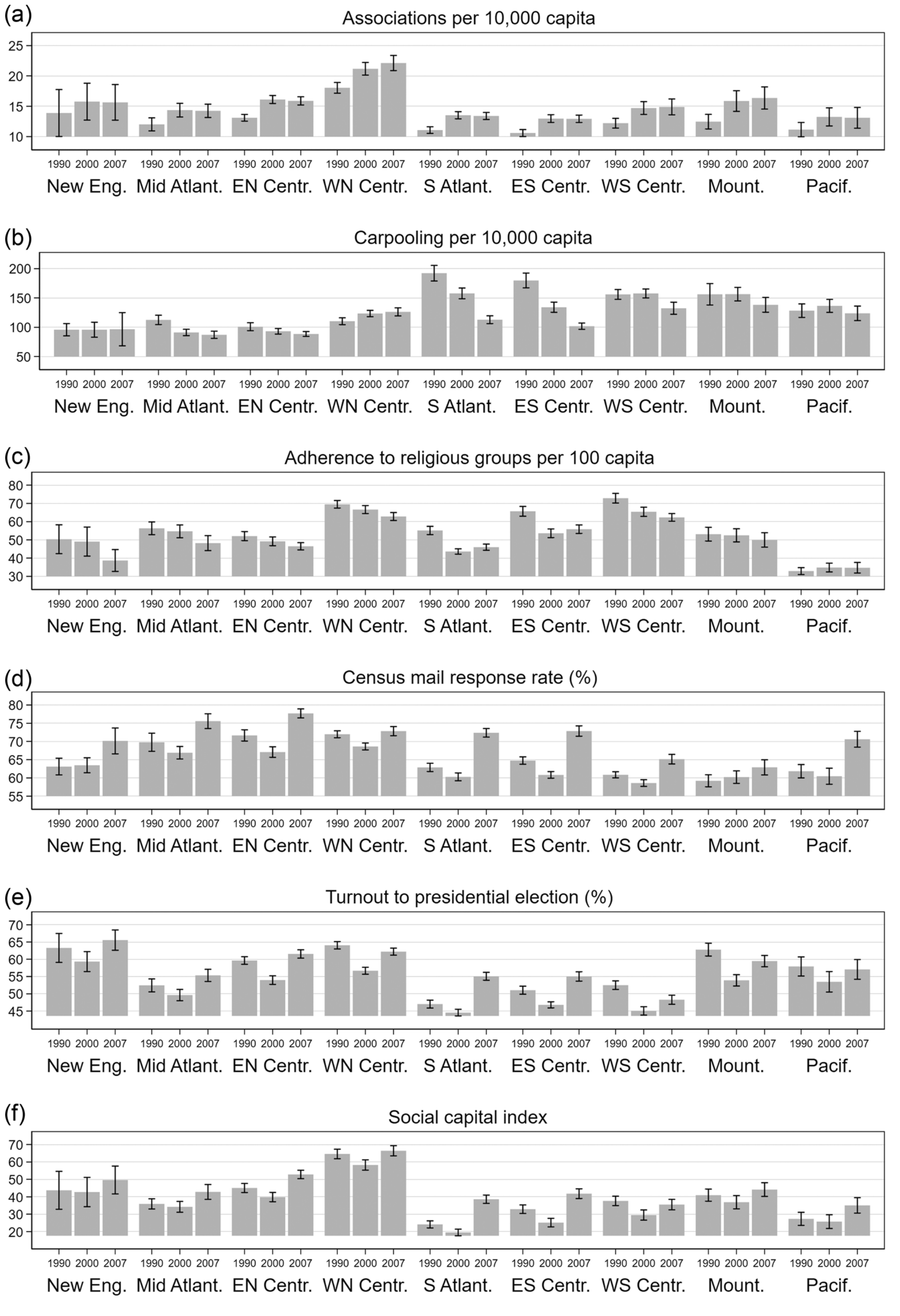

FIGURE 2 (See caption on next page)

participation to community life declining (or increasing less) in areas that were more exposed to import penetration from China. Quantifying this relationship and determining whether it may be causal is the central task for the econometric analysis I propose in Section 4.2.

Completing the descriptive picture I offered here, Supporting Information Appendix Table A.4 gives summary statistics for levels and first differences (decade-equivalent changes) of all main variables used in my analysis.

4.2 | The effect of trade shocks on associational density

As discussed in Section 3.1, associational density has several merits over alternative measures of social capital used in the literature. Thus, I focus on this definition for the econometric analysis, before considering the sensitivity of my findings to alternative outcomes. Table 1 reports the main results. I fit variations of the stacked first differences models specified in Equation (2), estimated using either ordinary least squares or 2SLS.

Column (1) gives the bivariate correlation between import penetration and associational density, controlling only for decade effects by absorbing a period dummy. The negative and statistically significant coefficient suggests

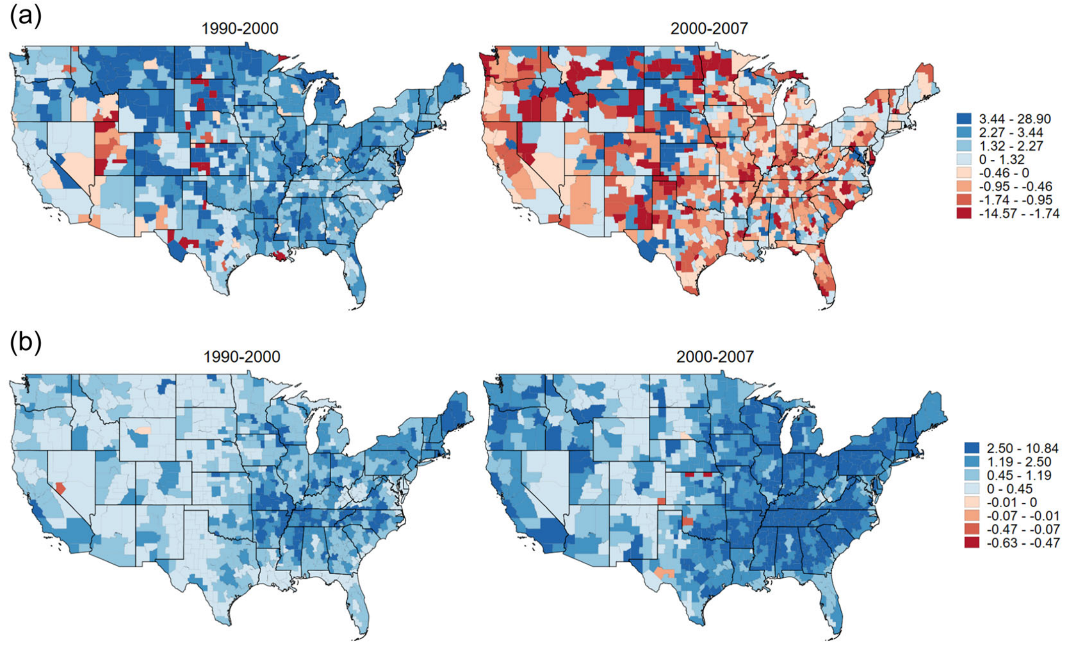

FIGURE 3 Choropleth map showing decade-equivalent changes in associational density per 10,000 capita (panel a) and import penetration from China per worker in US commuting zones (panel b) by period of analysis. Positive and negative changes in blue and red respectively, with cut-offs defined at quartiles of the distributions, computed separately for positive and negative changes across 1990–2007.

FIGURE 2 Average levels of different measures of social capital by Census Division and year. Capped spikes give 95% confidence intervals obtained using robust standard errors. The social capital index is constructed using the method discussed in Section 3.1.3. 2SLS, Two Stage Least Squares; EN Centr., East North Central; ES Centr., East South Central; Mid Atlant., Mid Atlantic; New Eng., New England; Pacif., Pacific; S Atlant., South Atlantic; WN Centr., West North Central; WS Centr., West South Central.

TABLE 1 Main estimates for the effect of import penetration on associational density.

	OLS				2SLS			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Regressor of interest								
ΔIP China to US	−0.141	−0.110	−0.0906	−0.0859	−0.341	−0.274	−0.311	−0.222
	(0.0599)**	(0.0498)**	(0.0401)**	(0.0416)**	(0.0969)***	(0.1000)***	(0.0930)***	(0.0838)**
Start-of-period controls								
Assoc. density (level)		0.0734	0.0726	0.0550	0.0512		0.0295	−0.0472
		(0.0439)	(0.0443)	(0.0501)	(0.0501)		(0.0517)	(0.0588)
Manuf. empl. CBP (%)			−0.00549	0.000173	0.0212		0.0298	0.0265
			(0.0115)	(0.0105)	(0.00986)**		(0.00971)***	(0.0132)*
Routine occupations (%)							−0.194	−0.0644
							(0.0656)***	(0.0856)
Offshorability index							0.0565	0.218
							(0.361)	(0.577)
ln Pop. density								−0.648
								(0.176)***
College (%)								0.0400
								(0.0206)*
Elderly (%)								0.182
								(0.0492)***
Homeownership (%)								0.0000366
								(0.0213)

TABLE 1 (Continued)

	OLS				2SLS			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Foreign born (%)								0.0230
								(0.0206)
Race frac.								0.826
								(0.469)*
Women empl. (%)								0.00726
								(0.0390)
Change from baseline	−1.96	−1.53	−1.26	−1.19	−4.73	−3.81	−4.32	−3.08
First stage coefficient					0.6543	0.7857	0.6502	0.6464
					(0.0619)***	(0.0558)***	(0.0623)***	(0.0628)***
Kleibergen–Paap *F*					111.59	198.21	108.81	105.82
Fixed effects	No	No	No	Div.	Div.	Div.	Div.	Div.
Adjusted R^2	0.1218	0.1357	0.1353	0.1378				
Observations	1444	1444	1444	1444	1444	1444	1444	1444

Notes: This table reports OLS and 2SLS estimates. Dependent variable: Change in number of associations per 10,000 capita (associational density). Instrumented endogenous regressor: Change in US imports from China per worker (import penetration). Excluded instrument: Change in imports from China per worker in other high-income countries. The level of observation is commuting zones by period. The change from baseline denotes the effect of a one standard deviation change in import penetration relative to average levels of the outcome, expressed in percentage points. The bottom section of the table shows the first stage coefficient results of the Kleibergen–Paap rk Wald *F* statistic for weak instruments. All regressions include a constant and control for a period dummy. Robust standard errors in parentheses are clustered at the state level.

Abbreviations: 2SLS, Two Stage Least Squares; Assoc., Associational; CBP, County Business Patterns; Div., division; frac., fractionalization; IP, import penetration; Manuf. empl., manufacturing employment; OLS, ordinary least squares; Pop., population.

$^*p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

that associational life declined in communities exposed more intensely to trade shocks from China. In particular, a one standard deviation increase in import penetration (about 2000 USD/worker) reduces associational density by just under two percentage points of the average baseline mean in the sample.[27] To facilitate the comparison of magnitudes across models, I report this quantification for all my estimates at the bottom of the table.

Columns (2) and (3) augment the previous specification by controlling respectively for start-of-period levels of associational density, and for initial shares of manufacturing jobs as measured by CBP data. The former addresses the possibility of general trends in the production of social capital. The latter, as discussed in Section 3.3, allows one to restrict the source of variation in import penetration to exogenous changes due to employment composition *within* manufacturing, rather than the share of local manufacturing jobs more in general. In so doing, it implicitly also captures any possible explanatory role of other nonmanufacturing employment, such as greater specialization in service jobs. Partly, the transition away from manufacturing could be ascribed to trade-induced deindustrialization. In this case, it can be thought of as a mechanism, as I discuss in further detail in Section 4.4. However, there are other drivers of structural change of this kind that could bias the coefficient of interest if not controlled for. Neither variable seems to matter much qualitatively, as the coefficient of interest remains negative and statistically significant. However, its absolute magnitude is slightly reduced. Column (4) introduces fixed effects for Census divisions to absorb unobserved trends specific to the broader geographical area around each CZ. Still, the coefficient on trade shocks remains negative and significant.

Columns (5)–(8) report 2SLS estimates. Here, I instrument the potentially endogenous US import penetration from China with import penetration in other high-income countries. For every regression, I report the coefficient on the instrumental variable from the first stage, as well as the Kleibergen–Paap *F* statistic to test for weak instruments. This metric is well above the conventional rule-of-thumb threshold of 10, suggesting that the instrument is relevant. I begin by fitting the same specification as in column (4), including Census division fixed effects. The point estimate remains negative and significant, increasing substantially in absolute magnitude. To ascertain that this result is not driven purely by including start-of-period levels of associational density and manufacturing employment, I omit these controls in column (6), with little change in findings. Column (7) reintroduces these controls, also adding the share of occupations that are susceptible to automation, and an index for "offshorability," that is, the average likelihood of a CZ's occupations to be moved abroad.[28] This has little effect on the coefficient's estimate.

Finally, column (8) introduces a number of controls to address the possibility that associational density dynamics differ across places with higher initial levels of population density, college education, elderly or foreign-born individuals, homeowners, or that have higher race fragmentation or female shares of employment. All these variables were argued in the literature to influence social capital formation (see Section 2.1). Indeed, several estimates turn out significant. However, I do not attempt to interpret any of these coefficients as they are likely biased. Still, even after controlling for these potentially confounding factors, a unitary change in import penetration from China has a negative and significant effect on associational density. The point estimate on this specification, my preferred, suggests that a one standard deviation increase in US import penetration per worker from China reduces the density of membership associations by about three percentage points relative to the baseline mean—a nonnegligible and economically meaningful magnitude.

I carry out a number of additional robustness checks to this specification, summarized in Supporting Information Appendix Table A.5. I compare results for different types of associational density, distinguishing between Putnam- and Olson-type associations (Knack & Keefer, 1997; Rupasingha et al., 2006).[29] Only the former

[27]The baseline mean of the outcome is 14.7 associations for every 10,000 residents, the standard deviation change in import penetration is 2.04—see Supporting Information Appendix Table A.4. The change, therefore, is calculated as $-0.14 \times 2.04 \div 14.7 \times 100$, and analogously in other specifications.
[28]These variables were obtained from the Autor et al. (2013a) replication data set. Their construction and definition are discussed in detail in Autor and Dorn (2013), to which I refer for additional information.
[29]Putnam associations, such as civic, social, and religious organizations, promote trust and cooperation. Olson associations, instead, which include business associations, unions, and political organizations, are established with a rent-seeking purpose to protect special interest groups (Olson, 1982).

appear to be affected by trade shocks, which also suggests that my findings are not uniquely driven by a fall in union membership, historically higher in manufacturing (Dickens & Leonard, 1985). I also include more restrictive fixed effects, absorbing trends specific to states or CZ,[30] with little qualitative effect on my finding. I also compare results by subperiod, running regressions separately for changes over 1990–2000 and 2000–2007. Despite a loss of precision due to a halving of observations, coefficients remain negative and statistically significant, with similar magnitudes to that reported in my preferred estimate. Finally, I consider alternative definitions of trade shocks that account for import penetrations from other low-income countries in addition to China, or import penetration from China, Mexico, and other Central American countries (see Autor et al., 2013a, for details on these variables). Despite a reduction in absolute magnitude, the coefficient remains negative and significant, confirming once again the robustness of my finding on associational density.

4.3 | Alternative measures of social capital

Table 2 examines alternative empirical definitions of social capital as outcomes, to determine the sensitivity of my results with respect to measurement. I consider carpooling, religious participation, Census mail response rates, voter turnout to presidential elections, and two variations of the social capital index (constructed using the four variables discussed in Section 3.1.3, or with three variables only, dropping voting turnout). Throughout, I rely on the preferred model specification reported in column (8) of Table 1, replacing associational density as the outcome, and controlling for start-of-period levels of the relevant alternative measures I consider (along with the other baseline controls).

My findings are clearly sensitive to the definition of social capital I adopt, confirming the difficulty of capturing the multiple dimensions of this concept unambiguously with just one variable. Import penetration has a negative effect on carpooling rates per capita, consistent with the result on associational density. However, column (2) suggests that variation in this outcome is driven to a large extent by a denominator effect, as I fail to detect a significant effect on carpooling rates per worker. Trade shocks, presumably, reduce the number of commuting workers in general, rather than commuters who carpool. I also detect small positive (though noisy) effects of import penetration on adherence to religious organizations or response rates to Census letters, and an even smaller positive (yet statistically insignificant) coefficient on voting turnout. Despite their small magnitude and lack of precision, these findings are inconsistent with the conclusions I drew with respect to associational density, casting doubts as to how much can be read into my previous analysis. Confirming this is the fact that neither version of the social capital index displays a statistically significant association with trade shocks either (columns 6 and 7). One may be tempted to conclude on this basis that deindustrialization is unrelated to social capital. But it may also be that the index is simply a poor proxy for this concept.

All in all, the sensitivity of my estimates to measurement suggests that results with respect to associational density should be interpreted cautiously. The negative effect of trade shocks on this outcome is per se robust, but it would be wrong to extend this finding to social capital more in general. Evidently, the density of membership associations only captures one aspect of a much broader and more complex concept.

4.4 | Heterogeneity and mechanisms

Having qualified the general conclusions that can be drawn for social capital, I turn again to associational density to explore possible heterogeneity and mechanisms for the effects I detect. The goal is to offer a

[30] In the latter case, the estimate is to be interpreted as an acceleration, and can only be identified thanks to the fact that I observe each CZ for two periods.

TABLE 2 Effect of import penetration on alternative measures of social capital.

	Carpooling		Additional index components			Social capital index	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Per capita	Per worker	Relig. part.	Census resp.	Turnout	4-Var.	3-Var.
ΔIP China to US	−2.828	−1.594	0.548	0.390	0.190	0.255	0.186
	(1.490)*	(3.365)	(0.284)*	(0.214)*	(0.164)	(0.248)	(0.295)
Change from baseline	−4.18	−1.00	1.94	1.24	0.72	1.32	1.03
First stage coefficient	0.6443	0.6441	0.6465	0.6437	0.6468	0.6434	0.6424
	(0.0624)***	(0.0625)***	(0.0629)***	(0.0635)***	(0.0630)***	(0.0636)***	(0.0635)***
Kleibergen–Paap *F*	106.72	106.10	105.50	102.89	105.46	102.44	102.37
Fixed effects	Div.	Div.	Div.	Div.	Div.	Div.	Div.
Start-of-period controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1444	1444	1444	1444	1444	1444	1444

Notes: This table reports 2SLS estimates. Dependent variables: carpooling per 10,000 capita or workers; adherence to religious congregations of any faith per 100 capita; Census letters mail return rate; voting turnout to US presidential elections; social capital indices (with and without voting turnout). Instrumented endogenous regressor: change in US imports from China per worker (import penetration). Excluded instrument: change in imports from China per worker in other high-income countries. The level of observation is commuting zones by period. The change from baseline denotes the effect of a one standard deviation change in import penetration relative to average levels of the outcome, expressed in percentage points. The bottom section of the table shows the first stage coefficient results of the Kleibergen–Paap rk Wald *F* statistic for weak instruments. All regressions absorb Census division fixed effects, a period dummy, and include the full set of start-of-period controls. Models in columns (4), (6), and (7) also include a dummy controlling for partly imputed observations. Robust standard errors in parentheses are clustered at the state level.

Abbreviations: 2SLS, Two Stage Least Squares; Census resp., Census response; Div., division; Relig. part., religious participation; Var., variable.

*$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

clearer picture of what may be happening on the ground, taking into account the diversity of American communities across the vast US territory, and the multiple channels through which trade shocks may affect participation in these communities.

I consider two dimensions of heterogeneity: degree of urbanization, and racial or ethnic composition. Both dimensions feature prominently in the analysis of Iyer et al. (2005), who recommend that studies take into account the remarkable diversity of social capital across regions. Greater diversity in a community may reduce participation in organized activities by lowering coordination and increasing frictions in communications and expectations (Alesina & La Ferrara, 2000; Charles & Kline, 2006; Glaeser & Maré, 2001). The population density in urban areas, by contrast, may promote social engagement by lowering the costs of participation to clubs and organizational life (Putnam, 1995, 2000). However, it may also increase anonymity, population churn, one-off interactions, and alternative uses of time, resulting in lower incentives to engage, cooperate, and trust one another (Brueckner & Largey, 2008). Moreover, denser urban areas may have been somewhat sheltered by trade shocks to manufacturing, in that they tend to have a greater concentration of services and nontradable goods production. They also offer greater opportunities for re-employment and adjustment in the face of economic adversity thanks to thicker labor markets (Duranton & Puga, 2001). In light of all this, the effect of trade shocks may differ across regions that vary along these dimensions.

I test these claims by re-estimating the model in column (8) of Table 1, where I interact import penetration with two categorical variables: one measuring the share of CZ residents who live in urban areas (less than 33%, up to

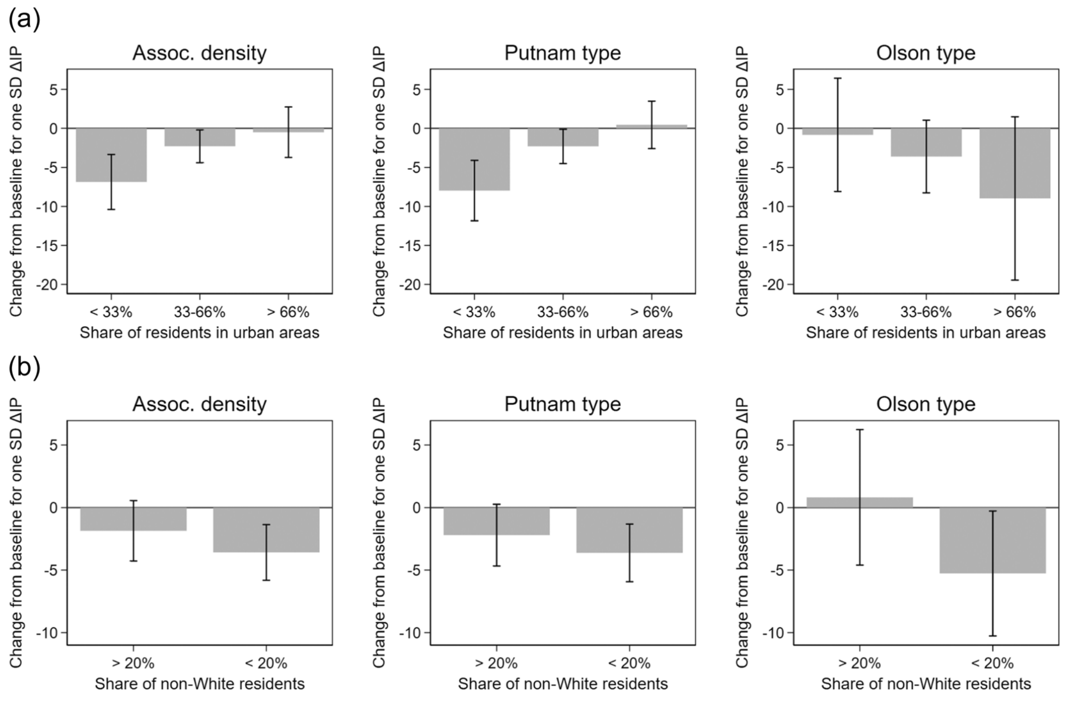

FIGURE 4 Effect of import penetration by the degree of urbanization (panel a) and racial or ethnic composition of the commuting zone (panel b). Coefficients were estimated using 2SLS, interacting import penetration (incl. the instrumental variable) with category dummies. Magnitudes are reported in terms of change from the baseline mean of the outcome (in percentage points), for a one standard deviation increase in import penetration. All regressions absorb Census division fixed effects, a period dummy, and include the full set of start-of-period controls. Capped spikes denote 90% confidence intervals. Robust standard errors are clustered at the state level. 2SLS, Two Stage Least Squares; Assoc., Associational.

66%, or more), another measuring the share of non-White residents (more or less than 20%).[31] I also control for the main effects of the categorical variable itself. Effectively, I allow treatment effects to vary across the groups defined by each variable. Results are summarized graphically in Figure 4, scaled in terms of changes from the baseline mean of the outcome to facilitate comparison. I report effects for associational density overall, as well as separately for Putnam- and Olson-type associations. Panel a reveals a clear gradient with respect to the degree of urbanization, with negative effects concentrated in rural areas. This finding appears to be driven mostly by Putnam organizations, whereas Olson organizations follow a reversed pattern, with urban communities capturing the lion's share of the downfall (though the estimate is very imprecise). Panel b, instead, shows that the decrease in the density of community associations was more pronounced in areas with less than 20% non-White residents, true for both Putnam and Olson organizations. In short, the decline of associational life in the face of shocks to the manufacturing sector appears to be a largely White and rural phenomenon.

Turning to mechanisms, Table 3 gives 2SLS estimates for the stacked first differences model in Equation (2), with associational density as an outcome. In columns (1)–(6), I use the change in import penetration to non-US high-income countries to predict the endogenous mechanism of interest. I do not claim that the instrument is valid for each variable. Coefficients do not identify the specific causal effect of each channel linking shocks to associational

[31]Nationally, about 80% of Americans were non-Hispanic Whites according to the 1990 Census, so the variable denotes communities that were more diverse than the United States overall in that year.

TABLE 3 Mechanisms for the effect of import penetration on associational density.

	Associational density						Comm. aid
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ΔIP China to US							1.061
							(0.507)**
ΔManuf. empl. (%)	0.422						
	(0.159)**						
ΔServ. empl. (%)		−19.40					
		(6.791)***					
ΔUnemployed (%)			−0.758				
			(0.294)**				
ΔNot in lab. force (%)				−0.454			
				(0.169)***			
ΔMean hh income					0.426		
					(0.166)**		
Δln Working-age pop.						−0.562	
						(0.556)	
First stage coefficient	−0.3399	0.0074	0.1891	0.3156	−0.3365	0.2553	0.6474
	(0.0389)***	(0.0011)***	(0.0333)***	(0.0514)***	(0.0502)***	(0.2444)***	(0.0626)***
Kleibergen–Paap *F*	76.20	45.62	32.15	37.77	44.94	1.09	106.86
Fixed effects	Div.	Div.	Div.	Div.	Div.	Div.	Div.
Start-of-period controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1444	1444	1444	1444	1444	1444	1444

Notes: This table reports 2SLS estimates. Dependent variable: Change in number of associations per 10,000 capita (associational density) in columns (1)–(6); change in employment in community aid and assistance services (NAICS codes 6242 and 6243) per 10,000 capita in column (7). Instrumented endogenous regressors: Change in US imports from China per worker (import penetration); changes in the share of working-age population employed in manufacturing, unemployed, or not in the labor force; changes in the share of jobs in services, in mean household income, or in working-age population. Excluded instrument: Change in imports from China per worker in other high-income countries. The bottom section of the table shows the first stage coefficient results of the Kleibergen–Paap rk Wald *F* statistic for weak instruments. All regressions absorb Census division fixed effects, a period dummy, and include the full set of start-of-period controls. Robust standard errors in parentheses are clustered at the state level.

Abbreviations: 2SLS, Two Stage Least Squares; Comm. aid, community aid; Div., division; hh income, household income; IP, import penetration; lab. force, labor force; Manuf. empl., manufacturing employment; NAICS, North American Industrial Classification System; pop., population; Serv. empl., service employment.

*$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

density (Feler & Senses, 2017). These are manifold and likely to interact with each other in unpredictable ways (Miguel et al., 2006). Rather, I report these alternative estimates to isolate the same identifying variation used for all previous results, in an attempt to paint a descriptive picture of how, through deindustrialization, trade shocks erode associational life in America.

Results show that the loss of manufacturing employment among working-age Americans, the growth of service jobs in the economy, greater unemployment, lower labor force participation, and falling household incomes, all contribute to decreasing associational density. By contrast, there does not seem to be an independent effect of fewer working-age Americans per se, ruling out that findings in columns (1), (3), and (4) are just due to a denominator effect induced, for instance, by selective migration, or by an effect of worker mobility per se. This suggestive evidence confirms the key role of manufacturing decline, in its various socioeconomic manifestations, on associational life.

Finally, I examine more closely the "social insurance" hypothesis put forward by Becker (1974). Does manufacturing decline increase reliance on, and provision of, support from the local community? Arguably, this behavior is also associated with social capital, which may explain positive point estimates in Table 2 for religious participation, Census response rates, vote turnout, and social capital indices. Measuring the amount of reciprocal favors and support exchanged in a community is extremely difficult. One metric that may approximate this relatively well is employment in sectors offering local assistance and support services. Drawing on CBP data, I consider NAICS codes 6242 and 6243: "community food and housing, and emergency and other relief services," and "vocational rehabilitation services." The former includes food banks, soup kitchens, temporary shelters, and community housing services for the needy. The latter refers to establishments offering job counseling, training, and sheltered workshops, among others, to unemployed and underemployed individuals, or people with disabilities or job market disadvantages.

Column (7) fits my preferred model specification, replacing associational density with this "community aid" variable, defined as employment per 10,000 capita in the above sectors. The positive and statistically significant coefficient on import penetration gives credit to Becker's (1974) theory of social insurance, whereby a community exposed to a negative shock comes together by providing compensating transfers of resources to the hardest hit. This finding is particularly noteworthy considering that spending on the provision of local public goods, such as safety, education, public welfare, and housing, instead, declined (Feler & Senses, 2017). It would appear that communities filled this gap in assistance left by local authorities. Participation in membership associations may have declined, yet in some sense social ties also grew stronger as the private supply of local support increased, suggesting individuals relied more on their peers for assistance. Deindustrialization, then, may have caused a qualitative change in the way social capital is expressed in areas hit by economic adversity, rather than a quantitative increase or loss. Due to significant measurement challenges, however, this interpretation is inevitably somewhat speculative and based on the limited suggestive evidence on the channel presented above.

5 | CONCLUSIONS

The persistent decline of manufacturing employment observed in the United States since at least the 1970s raises concerns about the effect these changes may have on American society. In his investigation of social capital in the United States, Putnam (1995, 2000) offers some evidence for a parallel long-term decline in social capital. This paper investigated the possibility that these two trends are connected, with particular attention to manufacturing shocks originating from the plausibly exogenous surge in import competition from China during the 1990–2007 period. In so doing, the paper documents a novel, noneconomic, consequence of manufacturing decline. It ties together with a literature that shows how higher import penetration from China is associated with polarization in voting behavior, substance abuse, and lower rates of marriage (Autor, Dorn, Hanson, & Majlesi, 2020a; Autor et al., 2019).

The paper provides new descriptive evidence on the geography of social capital in local communities across the United States, comparing stocks in different years and according to several alternative measures for this concept, including an index that treats social capital as a latent construct from multiple variables. Both in levels and trends, social capital displays a complex geography that varies depending on the measure one adopts. When considering the comprehensive index I propose, the patterns in the data confute the claim that American social capital has been declining monotonically. While I attest to a decrease in stocks before the turn of the century, I also observe that social capital subsequently grew to levels higher than in 1990. Several other measures I consider also show an upswing. Ultimately, the descriptive analysis confirms how challenging it is to capture the elusive and multifaceted concept of social capital with one unique measure (Chetty et al., 2022a).

This analysis also offers new evidence on economic adversity as a driver of social capital formation, focusing on the particular case of deindustrialization. I find that the manufacturing decline erodes participation in associational life. Trade shocks to this sector have a negative effect on the density of membership organizations available to community members, particularly in White rural areas. This relationship is robust to different model specifications. However, it is sensitive to how I define social capital empirically. As I consider alternative measures, trade shocks have no effect on social capital, or sometimes even a positive one. Whether this is due to mismeasurement, or to different variables picking up different aspects of this concept, is hard to tell. By considering mechanisms, I confirm that different socioeconomic manifestations of deindustrialization, such as income loss or unemployment, play a key role in reducing the social liveliness of communities exposed to trade shocks. Moreover, I uncover evidence suggesting that rather than changing in quantity, economic adversity causes social capital to morph qualitatively. As associational life subsides, trade shocks may induce stronger solidarity among residents, who I find participate more actively in the supply of community assistance services, such as housing, food, and training to the needy. This aligns with the social insurance mechanisms discussed in Becker (1974). Even so, I warn against “warm glow” interpretations of this type of social capital accumulation. Satyanath et al. (2017), for instance, find a positive association between social capital and support for the Nazi Party in interwar Germany. Perhaps it is here, then, that the seeds for the “revolt of the Rust Belt” that spurred Donald Trump's electoral success were sown (McQuarrie, 2017). Some evidence to this effect is offered in Rodríguez-Pose et al. (2021), who find that economic and demographic declines in strong social capital places were associated with support for Trump's bid to the presidency.

To conclude, it appears that communities react in different ways to trade shocks depending on a complex set of factors, often unobserved, and involving place-specific dynamics that interact with one another in ways that are hard to model quantitatively once and for all. Perhaps one key takeaway of this analysis is that, despite its elusiveness, social capital still warrants consideration from researchers due to its relevance both as an engine of economic prosperity, and as a potentially dangerous glue for broken communities.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study were derived from resources available in the public domain. Data on the number of associations in each CZ are obtained from the County Business Patterns database (CBP), which gives the number of establishments by six-digits North American Industrial Classification System (NAICS) or, before 1997, by four-digits Standard Industrial Classification (SIC) codes. Carpooling data is from the National Historical Geographic Information System (NHGIS) project (Manson et al., 2022). Turnout to presidential elections and rates of response to Decennial Census letters are obtained from ICPSR (2013), Rupasingha et al. (2006), and MIT Election Data and Science Lab (2018). Religious participation is measured using data on adherence to religious congregations of all faiths, collected by the Association of Statisticians of American Religious Bodies (ASARB) and distributed by the Association of Religion Data Archives (ARDA). Data on imports is from the UN Comtrade Database, available consistently for many high-income countries at six-digits Harmonized System product level from 1991 onwards. The matching of these data to US industry codes is described in the Supporting Information Appendix to Autor et al. (2013a, 2013b). Information on local industrial employment composition is obtained from the 1990 and 2000 CBP databases, which along with establishment counts also tabulate employment, firm size class, and payroll for US counties and industries. The aforementioned Supporting Information Appendix to Autor et al. (2013a, 2013b) also discusses the methodology used to impute missing employment figures for small establishments. All county figures are aggregated to the CZ level. All these data and the Supporting Information Appendix from the Autor et al. (2013a, 2013b) study are available at https://www.aeaweb.org/articles?id=10.1257/aer.103.6.2121. All control variables are measured using data from the USA Integrated Public Use Microdata Series (IPUMS) by Ruggles et al. (2020), or US Decennial Censuses, obtained from the IPUMS NHGIS project (Manson et al., 2022).

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REFERENCES

Akçomak, S., & ter Weel, B. (2009). Social capital, innovation and growth: Evidence from Europe. *European Economic Review*, *53*(5), 544–567.

Akçomak, S., & ter Weel, B. (2012). The impact of social capital on crime: Evidence from the Netherlands. *Regional Science and Urban Economics*, *42*(1), 323–340.

Alesina, A., & La Ferrara, E. (2000). Participation in heterogeneous communities. *The Quarterly Journal of Economics*, *115*(3), 847–904.

Algan, Y., & Cahuc, P. (2010). Inherited trust and growth. *American Economic Review*, *100*(5), 2060–2092.

Alrasheed, D. S. (2019). The relationship between neighborhood design and social capital as measured by carpooling. *Journal of Regional Science*, *59*(5), 962–987.

Andini, C., & Andini, M. (2019). Social capital and growth: Causal evidence from Italian municipalities. *Journal of Economic Geography*, *19*(3), 619–653.

Asquith, B., Hellerstein, J. K., Kutzbach, M. J., & Neumark, D. (2021). Social capital determinants and labor market networks. *Journal of Regional Science*, *61*(1), 212–260.

Autor, D., Dorn, D., Hanson, G., & Majlesi, K. (2020). Importing political polarization? The electoral consequences of rising trade exposure. *American Economic Review*, *110*(10), 3139–3183.

Autor, D., Dorn, D., Hanson, G. H., Pisano, G., & Shu, P. (2020). Foreign competition and domestic innovation: Evidence from US patents. *American Economic Review: Insights*, *2*(3), 357–374.

Autor, D. H., & Dorn, D. (2013). The growth of low-skill service jobs and the polarization of the US labor market. American Economic Review. *103*(5), 1553–1597. https://doi.org/10.1257/aer.103.5.1553

Autor, D. H., Dorn, D., & Hanson, G. (2019). When work disappears: Manufacturing decline and the falling marriage market value of young men. *American Economic Review: Insights*, *1*(2), 161–178.

Autor, D. H., Dorn, D., & Hanson, G. H. (2013a). The China syndrome: Local labor market effects of import competition in the United States. *American Economic Review*, *103*(6), 2121–2168.

Autor, D. H., Dorn, D., & Hanson, G. H. (2013b). The geography of trade and technology shocks in the United States. *American Economic Review*, *103*(3), 220–225.

Autor, D. H., Dorn, D., & Hanson, G. H. (2015). Untangling trade and technology: Evidence from local labour markets. *The Economic Journal*, *125*(584), 621–646.

Autor, D. H., Dorn, D., Hanson, G. H., & Song, J. (2014). Trade adjustment: Worker-level evidence. *The Quarterly Journal of Economics*, *129*(4), 1799–1860.

Banfield, E. C. (1958). *The moral basis of a backward society*. Free Press, Research Center in Economic Development and Cultural Change, University of Chicago.

Bartik, T. J. (1991). *Who benefits from state and local economic development policies?* W.E. Upjohn Institute for Employment Research.

Becker, G. S. (1965). A theory of the allocation of time. *The Economic Journal*, *75*(299), 493.

Becker, G. S. (1974). A theory of social interactions. *Journal of Political Economy*, *82*(6), 1063–1093.

Bell, D. (1976). The coming of the post-industrial society. *The Educational Forum*, *40*(4), 574–579.

Beugelsdijk, S., & Van Schaik, T. (2005). Differences in social capital between 54 Western European regions. *Regional Studies*, *39*(8), 1053–1064.

Blanchard, O. J., Katz, L. F., Hall, R. E., & Eichengreen, B. (1992). Regional evolutions. *Brookings Papers on Economic Activity*, *1992*(1), 1–75.

Bourdieu, P. (1986). The forms of capital. In J. G. Richardson (Ed.), *Handbook of Theory and Research for the Sociology of Education* (pp. 241–258). Greenwood Press.

Briant, A., Combes, P.-P., & Lafourcade, M. (2010). Dots to boxes: Do the size and shape of spatial units jeopardize economic geography estimations? *Journal of Urban Economics*, *67*(3), 287–302.

Brueckner, J. K., & Largey, A. G. (2008). Social interaction and urban sprawl. *Journal of Urban Economics*, *64*(1), 18–34.

Camagni, R. (2004). Uncertainty, social capital and community governance: The city as a milieu. In R. Capello & P. Nijkamp (Eds.), *Urban dynamics and growth: Advances in urban economics* (Vol. 266, pp. 121–149). Elsevier.

Camagni, R. (2017). Regional competitiveness: Towards a concept of territorial capital. In R. Capello, (Ed.), *Seminal studies in regional and urban economics* (pp. 115–131). Springer International Publishing.

Charles, K. K., & Kline, P. (2006). Relational costs and the production of social capital: Evidence from carpooling. *The Economic Journal*, *116*(511), 581–604.

Chetty, R., Jackson, M. O., Kuchler, T., Stroebel, J., Hendren, N., Fluegge, R. B., Gong, S., Gonzalez, F., Grondin, A., Jacob, M., Johnston, D., Koenen, M., Laguna-Muggenburg, E., Mudekereza, F., Rutter, T., Thor, N., Townsend, W., Zhang, R., Bailey, M., … Wernerfelt, N. (2022a). Social capital I: Measurement and associations with economic mobility. *Nature*, *608*, 108–121. https://doi.org/10.1038/s41586-022-04996-4

Chetty, R., Jackson, M. O., Kuchler, T., Stroebel, J., Hendren, N., Fluegge, R. B., Gong, S., Gonzalez, F., Grondin, A., Jacob, M., Johnston, D., Koenen, M., Laguna-Muggenburg, E., Mudekereza, F., Rutter, T., Thor, N., Townsend, W., Zhang, R., Bailey, M., … Wernerfelt, N. (2022b). Social capital II: Determinants of economic connectedness. *Nature*, *608*, 122–134. https://doi.org/10.1038/s41586-022-04997-3

Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology*, *94*, S95–S120.

Costa, D. L., & Kahn, M. E. (2003). Understanding the American decline in social capital, 1952–1998. *Kyklos*, *56*(1), 17–46.

Crescenzi, R., Gagliardi, L., & Percoco, M. (2013). Social capital and the innovative performance of Italian provinces. *Environment and Planning A*, *45*(4), 908–929.

Dasgupta, P. (2005). Economics of social capital. *The Economic Record*, *81*(255), S2–S21.

David, Q., Janiak, A., & Wasmer, E. (2010). Local social capital and geographical mobility. *Journal of Urban Economics*, *68*(2), 191–204.

De Blasio, G., & Nuzzo, G. (2010). Historical traditions of civicness and local economic development. *Journal of Regional Science*, *50*(4), 833–857.

Dhillon, A., & Peralta, S. (2002). Economic theories of voter turnout. *The Economic Journal*, *112*(480), F332–F352.

Dickens, W. T., & Leonard, J. S. (1985). Accounting for the decline in union membership, 1950–1980. *ILR Review*, *38*(3), 323–334.

DiPasquale, D., & Glaeser, E. L. (1999). Incentives and social capital: Are homeowners better citizens? *Journal of Urban Economics*, *45*(2), 354–384.

Duranton, G., & Puga, D. (2001). Nursery cities: Urban diversity, process innovation, and the life cycle of products. *American Economic Review*, *91*(5), 1454–1477.

Durlauf, S. N. (2002). On the empirics of social capital. *The Economic Journal*, *112*, 459–479.

Durlauf, S. N., & Fafchamps, M. (2005). Social capital. In P. Aghion & S. N. Durlauf (Eds.), *Handbook of economic growth* (Vol. 1B, pp. 1639–1699). Elsevier B.V.

Echebarria, C., & Barrutia, J. M. (2013). Limits of social capital as a driver of innovation: An empirical analysis in the context of European regions. *Regional Studies*, *47*(7), 1001–1017.

Eckert, F., Fort, T. C., Schott, P. K., & Yang, N. J. (2020). *Imputing missing values in the US Census Bureau's county business patterns* [Working Paper 26632]. National Bureau of Economic Research.

Faggio, G., & Overman, H. (2014). The effect of public sector employment on local labour markets. *Journal of Urban Economics*, *79*, 91–107.

Fazio, G., & Lavecchia, L. (2013). Social capital formation across space: Proximity and trust in European regions. *International Regional Science Review*, *36*(3), 296–321.

Feler, L., & Senses, M. Z. (2017). Trade shocks and the provision of local public goods. *American Economic Journal: Economic Policy*, *9*(4), 101–143.

Fort, T. C., Pierce, J. R., & Schott, P. K. (2018). New perspectives on the decline of US manufacturing employment. *Journal of Economic Perspectives*, *32*(2), 47–72.

Fujiwara, T., Meng, K., & Vogl, T. (2016). Habit formation in voting: Evidence from rainy elections. *American Economic Journal: Applied Economics*, *8*(4), 160–188.

Fukuyama, F. (2001). Social capital, civil society and development. *Third World Quarterly*, *22*(1), 7–20.

Ganau, R., & Rodríguez-Pose, A. (2023). Firm-level productivity growth returns of social capital: Evidence from Western Europe. *Journal of Regional Science*, *63*(3), 529–551. https://doi.org/10.1111/jors.12636

Geys, B. (2006). Explaining voter turnout: A review of aggregate-level research. *Electoral Studies*, *25*(4), 637–663.

Gibson, M. (2014). Bringing manufacturing back is the tide of offshoring beginning to turn towards reshoring? *Civitas: Institute for the Study of Civil Society*. https://civitas.org.uk/pdf/BringingManufacturingBack.pdf

Glaeser, E. L., & Gottlieb, J. D. (2006). Urban resurgence and the consumer city. *Urban Studies*, *43*(8), 1275–1299.

Glaeser, E. L., Laibson, D., & Sacerdote, B. (2002). An economic approach to social capital. *The Economic Journal*, *112*(483), F437–F458.

Glaeser, E. L., Laibson, D. I., Scheinkman, J. A., & Soutter, C. L. (2000). Measuring trust. *The Quarterly Journal of Economics*, *115*(3), 811–846.

Glaeser, E. L., & Maré, D. C. (2001). Cities and skills. *Journal of Labor Economics*, *19*(2), 316–342.

Guiso, L., Sapienza, P., & Zingales, L. (2004). The role of social capital in financial development. *American Economic Review*, *94*(3), 526–556.

Hilber, C. A. L. (2010). New housing supply and the dilution of social capital. *Journal of Urban Economics*, *67*(3), 419–437.

ICPSR. (2013). *General election data for the United States, 1950–1990* [dataset].

Iyer, S., Kitson, M., & Toh, B. (2005). Social capital, economic growth and regional development. *Regional Studies*, *39*(8), 1015–1040.

Jackson, M. O. (2020). A typology of social capital and associated network measures. *Social Choice and Welfare*, *54*(2–3), 311–336.

Jahoda, M., Lazarsfeld, P. F., & Zeisel, H. (1971). *Marienthal: The sociography of an unemployed community*. Transaction Publishers.

Kan, K. (2007). Residential mobility and social capital. *Journal of Urban Economics*, *61*(3), 436–457.

Knack, S. (2002). Social capital and the quality of government: Evidence from the states. *American Journal of Political Science*, *46*(4), 772–785.

Knack, S., & Keefer, P. (1997). Does social capital have an economic payoff? A cross-country investigation. *The Quarterly Journal of Economics*, *112*(4), 1251–1288.

Kongsamut, P., Rebelo, S., & Xie, D. (2001). Beyond balanced growth. *The Review of Economic Studies*, *68*(4), 869–882.

Lederman, D., Loayza, N., & Menéndez, A. M. (2002). Violent crime: Does social capital matter? *Economic Development and Cultural Change*, *50*(3), 509–539.

Lin, N. (2001). Building a network theory of social capital. In N. Lin, K. Cook, & R. S. Burt (Eds.), *Social capital: Theory and research*. Routledge.

Manson, S., Schroeder, J., Van Riper, D., Kugler, T., & Ruggles, S. (2022). *IPUMS national historical geographic information system: Version 17.0 [dataset]* (17th ed.). IPUMS.

Mazziotta, M., & Pareto, A. (2016). On a generalized non-compensatory composite index for measuring socio-economic phenomena. *Social Indicators Research*, *127*(3), 983–1003.

McPherson, M., Smith-Lovin, L., & Cook, J. M. (2001). Birds of a feather: Homophily in social networks. *Annual Review of Sociology*, *27*(1), 415–444.

McQuarrie, M. (2017). The revolt of the rust belt: Place and politics in the age of anger. *British Journal of Sociology*, *68*, S120–S152.

Miguel, E., Gertler, P., & Levine, D. I. (2006). Does industrialization build or destroy social networks? *Economic Development and Cultural Change*, *54*(2), 287–317.

MIT Election Data and Science Lab. (2018). *County presidential election returns 2000–2020* [dataset].

Molloy, R., Smith, C. L., & Wozniak, A. (2011). Internal migration in the United States. *The Journal of Economic Perspectives*, *25*(3), 173–196.

Murphy, L., Huggins, R., & Thompson, P. (2016). Social capital and innovation: A comparative analysis of regional policies. Environment and Planning C: Government and Policy. *34*(6), 1025–1057. https://doi.org/10.1177/0263774X15597448

Nardo, M., Saisana, M., Saltelli, A., Tarantola, S., Hoffmann, A., & Giovannini, E. (2008). *Handbook on constructing composite indicators: Methodology and user guide*. OECD Publishing.

OECD. (2017). *Generalised trust in the United States, 1972–2014*. OECD Publishing.

Olson, M. (1982). *The rise and decline of nations*. Yale University Press.

Openshaw, S., & Taylor, P. J. (1979). A million or so correlation coefficients: Three experiments on the modifiable areal unit problem. *Statistical Applications in the Spatial Sciences*, *21*, 127–144.

Paxton, P. (1999). Is social capital declining in the United States? A multiple indicator assessment. *American Journal of Sociology*, *105*(1), 88–127.

Percoco, M. (2012). Entrepreneurship, social capital and institutions: Evidence from Italy. *Spatial Economic Analysis*, *7*(3), 339–355.

Percoco, M. (2015). Entrepreneurship, family ties, and land inequality: Evidence from Italy. *Growth and Change*, *46*(3), 443–457.

Pisano, G., & Shih, W. C. (2009). Restoring American competitiveness. *Harvard Business Review*, *87*(7/8), 114–125.
Pisano, G., & Shih, W. C. (2012). Does America really need manufacturing? *Harvard Business Review*, *90*(3), 94–102.
Polanyi, K. (1945). *The great transformation: The political and economic origins of our time*. Beacon Press.
Portes, A. (1998). Social capital: Its origins and applications in modern sociology. *Annual Review of Sociology*, *24*(1), 1–24.
Putnam, R. D. (1995). Tuning in, tuning out: The strange disappearance of social capital in America. *PS: Political Science & Politics*, *28*(4), 664–683.
Putnam, R. D. (2000). *Bowling alone: The collapse and revival of American community*. Simon & Schuster.
Putnam, R. D., Leonardi, R., & Nanetti, R. Y. (1993). *Making democracy work*. Princeton University Press.
Rodríguez-Pose, A., Lee, N., & Lipp, C. (2021). Golfing with Trump. Social capital, decline, inequality, and the rise of populism in the US. *Cambridge Journal of Regions, Economy and Society*, *14*(3), 457–481.
Rodríguez-Pose, A., & Storper, M. (2006). Better rules or stronger communities? On the social foundations of institutional change and its economic effects. *Economic Geography*, *82*(1), 1–25.
Rosenfeld, R., Baumer, E. P., & Messner, S. F. (2001). Social capital and homicide. *Social Forces*, *80*(1), 283–310.
Ruggles, S., Flood, S., Goeken, R., Grover, J., Meyer, E., Pacas, J., & Sobek, M. (2020). *IPUMS USA: Version 10.0 [dataset]*. IPUMS.
Rupasingha, A., Goetz, S. J., & Freshwater, D. (2006). The production of social capital in US counties. *Journal of Socio-Economics*, *35*(1), 83–101.
Satyanath, S., Voigtländer, N., & Voth, H. J. (2017). Bowling for fascism: Social capital and the rise of the Nazi party. *Journal of Political Economy*, *125*(2), 478–526.
Schettkat, R., & Yocarini, L. (2006). The shift to services employment: A review of the literature. *Structural Change and Economic Dynamics*, *17*(2), 127–147.
Storper, M. (1995). The resurgence of regional economies, ten years later: The region as a nexus of untraded interdependencies. *European Urban and Regional Studies*, *2*(3), 191–221.
Storper, M. (2005). Society, community, and economic development. *Studies in Comparative International Development*, *39*(4), 30–57.
Tabellini, G. (2010). Culture and institutions: Economic development in the regions of Europe. *Journal of the European Economic Association*, *8*(4), 677–716.
Tocqueville, A. d. (1835). *Democracy in America: Historical-critical edition of "De la démocratie en Amérique*." Liberty Fund Inc.
Tolbert, C. M., & Sizer, M. (1996). *US commuting zones and labor market areas: A 1990 update* [Economic Research Service Staff Paper, No. AGES-9].
Turner, R. (1996). De-industrialisation, economic regeneration, and social capital. *Teaching Public Administration*, *16*(2), 47–58.
Vu, K., Haraguchi, N., & Amann, J. (2021). Deindustrialization in developed countries amid accelerated globalization: Patterns, influencers, and policy insights. *Structural Change and Economic Dynamics*, *59*, 454–469.
Zak, P. J., & Knack, S. (2001). Trust and growth. *The Economic Journal*, *111*(470), 295–321.

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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