Scenes, Innovation, and Urban Development

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*Abstract: This paper seeks to link urban scenes to urban development as ingredients of creative cities. Synthesizing the literature on creative cities, we adduce several “factors of creativity” such as education, technology, nature, density, artists, and bohemians. We join urban scenes, measured as clusters of cultural amenities (such as galleries, cafes, restaurants, book stores, museums, clothing stores, and more) to the set, and propose and test several hypotheses about how various scenes that highlight a range of experiences such as self-expression, glamour, or local authenticity might foster creative environments, drive development, and shift the impacts of other factors. We find that (some) scenes are significantly linked with many key indicators of urban development and innovation, such as patents, population growth, wages, rents, income. How people consume impacts how they work.*

 Our central hypothesis is that urban scenes encourage urban development. The qualities of life affirmed and enabled in the collections of amenities that define a place’s leisure, consumption, and expressive qualities contribute to its quality and type of workplaces, to its residential patterns, and to its political debates and culture. But the specific mechanisms are diverse. Our general strategy in assessing scene impacts is first to review some of the broader concepts and background from which hypotheses about multiple causes emerge, and to link those to what we have defined elsewhere as the analytic elements of scenes (Silver, Clark, Navarro, 2010). We often include simple examples of how these operate (such as cafe discussions in a glamorous neighborhood). Next we specify propositions about impacts of scenes on urban development, such as glamorous scenes might attract young college graduates or self-expressive and transgressive scenes might signal and foster openness to creative risk-taking. Then we use multiple methods to test such impacts, especially variations of multiple regression analysis, combined with other methods such as quintile and path analysis. We test for instance if the presence of glamorous scenes – fashion houses, film studios, designer boutiques, and so on – predicts innovation and development above and beyond such overlapping, established variables as education, income, cost of living, and the like.

This paper’s hypotheses and analyses about scenes as one factor that contributes to “creative cities” grow out of related prior work. Scenes have increased in historical and theoretical salience as social groups rooted in individual taste have joined and redefined those rooted in ethnicity, class, or religious affiliation (Irwin 1977, Blum 2003, Straw 2002, Bennett and Peterson 2004). The role of life in scenes in social and personal life merits study in its own right. We treat scenes analytically as “third spaces” primarily devoted to the pleasures of meaning-making through sociable consumption in establishments like music venues, bars, cafes, and malls, in contrast to work, home, or political spaces, and distinct from sub-cultures or milieus (Leach and Haunns 2008). Scenes have their own internal logics and dramas that unfold for instance around how to express original feelings rather than pale imitations, stay true to rather than do violence to a tradition, shine glamorously rather than fade into anonymity, project warmth and intimacy rather than distance and aloofness, maintain an authentically real life rather than a phony existence. We have articulated this internal environment of life in scenes in terms of three broad dimensions of pleasure that define the qualitative experience of a scene: theatricality, authenticity, and legitimacy. And we have divided each of these dimensions into more specific sub-dimensions around which a scene may cohere on the basis of affirming them or resisting them, such as traditional legitimacy, transgressive theatricality, or local authenticity (see Silver, Clark, Rothfield 2006 and Silver, Clark, and Navarro 2010 for more detailed theoretical elaboration). Table 1 summarizes these dimensions and provides some illustrative samples of our amenities indicators.

[INSERT TABLE 1]

In order to assess the variation of scenes across locations, we have developed a number of measures of scenes. At this stage of research, we focus on clusters of urban amenities as indicators of the scene-dimensions available in a given place, utilizing a national database of over 600 amenity-types that covers all United States zip codes. We code each amenity on a five-point scale on the basis of the extent to which the amenity affirms, resists, or is neutral with respect to each of the 15 sub-dimensions of a scene. This procedure enables us to draw a rich portrait of the American scenescape at a variety of levels, revealing the face-validity of our measures (Silver, Clark, Navarro, 2010). One example is the map presented as Figure 1.

[INSERT FIGURE 1]

This map represents local variation on a factor score derived from a principal component analysis of all 15 dimensions, accounting for approximately 44% of the total variance. This allowed us to measure where any location falls along the spectrum that most powerfully divides the American scenescape as a whole. As we had hoped, the loadings for each sub-dimension suggested a consistent interpretation that embodies the classic contrast between Gemeinschaft and Gesellschaft. On one end of the spectrum are “urbane” scenes of glamorous and transgressive theatricality, utilitarian and self-expressive legitimacy, and rational, state, and corporate authenticity. On the other are “communitarian” scenes of traditional and charismatic legitimacy, formal and neighborly theatricality, and local authenticity. A summary of our coding procedures and data sources is included in the appendix.

In the present context, however, we bracket these questions about how scenes *arose*, what scenes *are*, how we *measure* them, and *where* they are. Instead, we address questions about what scenes *do*, focusing on their impact on one aspect of their “external environment,” namely the economic world of wealth, work, and production.[[1]](#footnote-1) From this perspective, scenes are one among many factors of production that contribute to a city’s economic vitality. Our investigation thus concerns whether and how scenes join with other mechanisms to encourage urban economic development, in particular as one factor that cultivates an urban environment in which innovative production is more likely to occur. That is, we seek to connect how and where people consume with how and where they produce. Typically, there has been a disparity between consumption and production models of culture. This paper proposes a set of mechanisms and causal linkages that join the two.

*The Institutionalization and Internalization of Creativity*. We begin our analysis of the impact of scenes with what has come to be known as the “creative cities thesis” because this topic has attracted much recent attention, both among academics and policy-makers (Romein and Trip 2008 review key aspects of this literature). Spurred by the decline and outsourcing of manufacturing in Western economies since the 1970’s, many cities have sought alternative sources of vitality. Cities have cheated “the death of distance” (Craincross 1997) through developing themselves, as in New York and London, into hubs for business and financial services (Sassen 2001); into centers for tourism, consumption, and leisure activities as in Bilbao, the Boston waterfront, and Chicago’s Millennium Park (Clark 2003); or, into focal points for gathering the talented, creative individuals (“human capital”) crucial to success in “knowledge economies,” as in Silicon Valley, Seattle, Barcelona, and the North Carolina “research triangle” (Florida 2002, Reich 1992, Becker 1993). Human performance has come to count for economists as one of the key factors of production (Parsons 2006). This, it is claimed, is “an economy where a person’s ideas, not land or capital, are the most important input and output” (Howkins 2002).

 Innovation is not equally distributed across space: the number of scientists and engineers per 1000 people in the U.S., Germany, and Japan dwarfs the number in many other developed countries. Variations within countries are also striking. Economic geographers have stressed that locations able to harness the means of cognition are as significant as those that harness the means of production. (cf Polensky 2007)

This recent focus on “creative cities” builds on deeper social and cultural changes. To be sure, creativity is not a new value; it is as at least as old as Genesis 1, after all. But beginning especially in the 19th century, a number of intellectual movements made creativity increasingly internal to their understanding of *human* action as such (Joas, 1996): Herder on Expression; Marx on Revolution and Praxis; Schopenhauer, Nietzsche, and Simmel on Life; Weber on Charisma; Durkheim on Collective Effervescence; and James, Dewey, and Mead on Intelligence and Pragmatic Improvisation. Schumpeter’s “creative destruction” built innovation and not only cost-effective production into the core of economic activity, and Jane Jacobs made surprise and disorder the very stuff of urban development (Jacobs 1961, Jacobs 1969, see also Sennett 1970). These movements congeal in what Howard Rosenberg called the historically novel “tradition of the new” (Rosenberg 1959).

In the 20th century, and especially since the 1960’s, this tradition, formerly more exclusive to an intellectual and artistic “avant-garde,” diffused to the broader public (Clark 1998; Taylor 2007; Parsons 1978). Key social drivers include mass education, mass communication, and increased geographic mobility, together with the need of capitalism to constantly generate new needs (Bell 1973). At an existential level, some authors have highlighted an increasing awareness of life’s fragility, unsettledness, and alterability, made unavoidable by two world wars (Joas 2004). Others have stressed “expressive” reactions against a stifling, bureaucratic, overly rational culture (Marcuse 1964); while still others have sought to understand the conditions under which such an “expressive revolution” could be integrated into basic societal functions, like production, domestic relations, and politics (Parsons 1978). A related stream of thought points to internal value-pressures within western culture toward individuality and spontaneity, both as “inner-worldly” activism as well as an “expressive individualism” already implicit in early Christian notions of Love (Bellah 1996). Personalities formed on the basis of the disciplined Protestant Work Ethic made room for the Bohemian and Romantic quest for authenticity and personal expressiveness, unsettling distinctions between productive work and unproductive play (Taylor 2007, Bell 1996, Brooks 2000, Campbell 1989).

In this intellectual, cultural, and historical context, questions about how to institutionalize and internalize the value of creativity in cities and individuals have naturally become central. Municipal cultural policy has grown, together with investment in cultural infrastructure, artist support, and arts incubators. Quebec for instance has seen a fourteen-fold increase in the number of cities with official municipal cultural policies between 1992 and 2002 (Durantaye 2002). In 1975, Saul Bellow wrote, "there were beautiful and moving things in Chicago, but culture was not one of them.” By 2009, the Director of the National Endowment of the Arts could say: “Mayor Daley should be the No. 1 hero to everyone in this country who cares about art.”[[2]](#footnote-2) The number of individuals employed (or unemployed) as artists and in the cultural industries has risen dramatically in many countries, as has participation in and number of cultural organizations and amenities (most dramatically in the U.S., Canada, and Netherlands, see Clark and Silva, forthcoming).

New questions arise: What infrastructure, education, work environments, public policy, and political culture best harness the human creative potential? How can artistic, entrepreneurial, and scientific endeavor be instituted as activities unto themselves, and combined with one another in ways that enhance urban development, innovation, and the broader public good? With questions like these, “the Creative Class” seems on its way to self-consciousness.

*Beyond Silver Bullets*. No doubt the “creative cities thesis” has generated much hype, and with it, ample opportunities for derision and scorn (cf. Chatterton 2007). One popular Youtube video, “Juicing the Creatives,”[[3]](#footnote-3) depicts “creativity fields” where an old English farmer grows various assortments of hipsters and artists, before distilling their essence into a creativity juice to be sold on the open market.

Much of this response is sensible. Advocates have promoted one-dimensional, one-size-fits-all quick fixes that generalize from single cases or single dimensions of creativity. A Bilbao for every city! Bike paths for all! Bohemias everywhere! Attract The Gays and the Rest will follow!

Such unilateral and rigid approaches defy the very fluidity, situation-specificity, and nuance so central to successful creative endeavor. Thus, in this paper, we propose treating the presence, absence, and combination of various collections of urban amenities – themselves multi-dimensional entities attractive and stimulating to different sorts of individuals and groups – as *factors* that may contribute to the creativity and growth of cities in reference to and interaction with a number of other key factors. We assess their impacts on the innovativeness of cities as indicated by patent filings, and the overall economic development of cities and neighborhoods as indicated by growth in population, rents, incomes, and college graduates. Thriving scenes are elements of economically productive urban environment, but they are not the only ones, and they often operate to enhance other components. A thick labor market plus a thriving music scene might be more significant than either on its own; stable residential communities plus a family-focused scene might generate a more stimulating city than either would separately; warm weather plus an exciting festival scene might be more energizing than each would be independently.

We thus analyze the contribution of scenes to urban development together with other factors typically cited as causes of the growth and innovativeness of cities. We outline a range of potentially key factors that have been important in the academic literature, along with their theoretical connection to innovativeness and development. We then discuss how scenes may add to and alter the impacts of these factors, developing testable hypotheses about how each of these factors, independently and in combination with scenes, can contribute to creative cities, in different ways, in different contexts. We do not endorse or expect all of these hypotheses to be confirmed, but rather consider the hypotheses to be extensions of the logics implicit in each factor’s potential role in urban development. Throughout, we report on some of the results of our ongoing efforts to test these hypotheses.

*Data and Methodology*. Scenes are a new concept for social science. Our scenes measures are quite different from most past empirical work. We and most observers are naturally skeptical or at least cautious about the operation and significance of such new processes. We (and others!) were particularly skeptical when we found, in related work, that glamorous scenes seemed to drive job growth. This led us to explore the associations and multiple impacts of scene-dimensions like self-expression or glamour more closely than one might for common variables like income or population size. The null hypothesis is that scenes have zero impact in a properly specified model. Yet what is “properly”? Given the dramatic unconventionality of scenes among social scientists we correspondingly included many measures and forms of analysis widely used by other social scientists. To these more standard models, we add scenes, in order to assess if and how scenes change past results.

Our main *dependent variables* are correspondingly among the most widely used in the social sciences: changes in per capita income, population, gross rent, employment, college graduates and post-graduates. To this set of variables we add a measure of innovation: the per capita rates at which three different types of patents were filed with the US Patents Office – technology patents, entertainment patents, and other patents from 1975 to 1999. We refer to this set of dependent variables collectively as Creative City Dependant Variables (CCDV’s), but also refer to the economic development and innovation measures separately.

Our general strategy is to include a set of *independent variables* drawn from past research that we refer to as “the Core.” These represent basic measures utilized by leading researchers in the subfield studying each dependent variable. The Core includes population size, percent of population who are non-white, median gross rents, percent college graduates, percent democratic vote for President, crime rate, and the location quotient of a broad measure of artistically-related jobs. The first four variables are taken from the 1990 Census and are at the zip code level. Voting data are for the 1992 Presidential election and crime rate data are for 1999. Both are taken from the County and City Data Book (CCDB) compiled by the Census Bureau and both are at the county level. The jobs location quotient is derived from the Census’s County Business Patterns (CBP) data of 1998 and is measured at the zip code level. Finally, the Core includes the factor score mapped above.

All impacts reported below are net of the above Core group of independent variables. The Appendix includes more detailed summaries of our data sources, variable definition, and variable construction methods. Together, these provide us with a powerful range of measures for beginning to evaluate the social conditions more likely to produce innovative and growing urban economies.

We include *other variables* as specified by the substantive propositions developed below. For example, we measure concentrations of technological firms and research institutions using the CBP. We use the 1990 Census to generate measures of the percent of people who work at home, percent of people who use public transportation, and the mean travel time to work of a zip code. The U.S.D.A. provides our information about natural amenities, and the DDB Needham Lifestyle survey provides our information about social climates.

In the course of performing our research we discovered that some items were either not available in a consistent manner nationally, or were too strongly intercorrelated with other items to permit including them all in the model. We usually omitted independent variables which had Pearson correlations with each other that were greater than 0.5 in magnitude, but also rely on variance inflation factors (VIFs) to detect whether multicollinearity was problematic or not. For most models the VIF of independent variables does not exceed 4, and in no case does it exceed 10. After resolving these issues, our analyses always begin with Core models for each dependent variable that are estimated using multiple regression and related methods. To these models we added “other variables,” one or a few at a time, depending on the substantive proposition. These were added to assess both direct effects and the possible suppression of Core items by the other variables. This method of beginning with a set of core variables and adding other measures to the analysis as needed has been robust in past works (cf. Clark, 2003). This approach allows us to maintain a consistent frame of reference across propositions by testing each with respect to a widely acknowledged set of predictors. Thus we are agnostic toward debates about which of the Core may be most important for any given dependent variable, but remain sensitive to the relative impact of including our variables of interest on these associations.

Our *units of analysis* are multiple. This is an unfortunate fact that could not be avoided given the availability of patents, crime rate and voting data. None of these variables were reliably available at the zip code level for the entire United States. Our main scenes data were collected for individual street addresses (from sources like the electronic yellow pages) or zip codes (from the CBP data). Statistical analyses involving scenes included other zip code level items, but due to issues like varying catchment areas for different scenes we experimented with different unit sizes, especially counties and metro areas. For instance a coffee shop’s catchment area is normally less than a zip code, but a sports stadium or opera may serve a metro area; both could attract college graduates or interact with other factors of creativity. We thus merged zip code level variables into files with variables measured at the county, municipal or metro levels. In this way we often combined several levels in a single regression analysis, especially if we posit cross-effects between levels (for instance, migrants can be attracted by the metro area stadium as well as by the zip code café). The typical approach to assessing multi-level effects is to employ Hierarchical Linear Modeling (HLM) and related methods. For our purposes here, however, the violation of independence introduced by adding county-level measures as predictors/outcomes is in addition to the violation of independence introduced by the spatial autocorrelation of zip codes (which are either adjacent or in proximity). Fully addressing these issues calls for combined HLM and spatial dependence approach that is not only just being developed and applied (see Savitz and Raudenbush 2009) but also far exceeds the scope of an initial analysis. Obviously such methods will provide substantial opportunities for future research testing our findings.

For instance, bohemian scenes predict rising college graduate in Chicago, but not in New York and Los Angeles. Metro areas (CMAs, SMSAs, etc.) have some advantages, but using them exclusively means omitting non-metro areas, or treating them as missing, which we prefer to avoid in general as the small town and rural areas often dramatically differ from big metro areas on some scene dimensions. We still do this occasionally. But more often we use a simpler solution: include all US zip codes, since these cover the entire US – unlike metro areas, which omit rural and smaller towns. Nevertheless, certain criteria suggest the advantages of each of these levels of units, so we sometimes use all of them. For important results, we replicated similar models across multiple units (zip code, city, county, metro, etc.) to look for variations, such as the bohemia results, which shifted from LA to Chicago and New York.

We analyze both *direct and interaction effects. Direct effects* are most simply measured by coefficients of independent variables in a multiple regression. *Interaction effects* are present when direct effects shift across contexts--such as glamour is more important for job growth in LA than Chicago—and are investigated both by using multiplicative interaction terms as well as by performing separate regressions on different quintiles of a particular variable. Local culture and scenes can operate both ways: first by exerting their own direct effects, second by defining a context (e.g. as glamorous) which shifts effects of other variables. Sharpe (2007) and DeLeon and Naff (2004) have stressed that local political cultures can be detected in such interactions.

*Missing data* was substantial in some instances, especially when we combined various data sources. For instance, the Census population data are not reported in full detail for zip codes where such reporting could violate confidentiality (i.e. very low population). Hence some 10,000 of the roughly 40,000 zip codes have no data for income, education, and similar items from the Census of Population. The low N is also due to the fact that many zip codes are merely post boxes for mailing purposes (i.e. corporate offices). Thus the US Post Office lists these post boxes as “zip codes,” but the Census Bureau drops these and other uninhabited areas like forests. One consequence of this, and the fact that actual zip codes are not static nor bounded within a single county or state, is that the Census Bureau uses the label, “zip Code tabulation areas (ZCTAs),” to contrast with the US Post office’s official “zip code”. At the same time, the branch of the Census Bureau responsible for reporting data on the type and number of businesses in a given location (i.e. the CBP data) includes about 10,000 more ZCTAs than the Census of Population. This is a major case of a partially “truncated” data file that we had to address, generated by the disparity between the Census Bizzip data (N=nearly 35,000) and Census of Population data (N=28,000). While many of our zip code items are from the Census, we retain the term zip code rather than ZCTA to ease communication with those unfamiliar with the distinction. Officially the Census Bureau claims there is no relationship between the two, but in practice the fact that we use only ZCTAs eliminates possible confusion regarding overlapping geographies.

Often the issue is not missing data, but zero scores on specialty amenities like niche restaurants, theater, shops, etc. which are absent in most medium and small town and rural areas. Applying a log transformation usually sufficed to bring skewness and kurtosis scores into reasonable ranges.

We do not below include tables showing detailed regression outputs, opting instead to report substantively interesting results and representative summary figures. All *R* syntax can be found at http://scenes.uchicago.edu/hcc.R and the relevant data can be downloaded at http://scenes.uchicago.edu/zipcode.

**Factors of Creative Cities**

 *Education.*  Urban development has been linked with the consequences of the explosion of higher education in the U.S. and globally. Universities, not factories, are increasingly at the centers of successful cities. Berkeley, Stanford, and Silicon Valley provide perhaps the most famous example. The relative success of Columbus, Ohio versus Cleveland, Ohio – the former with Ohio State University at its center, the latter struggling after the decline of steel – speaks to a more general significance. Talcott Parsons considered the “educational revolution” as important as the industrial revolution in that it bound productivity more explicitly to cultural factors like scientific research, organization, and managerial intelligence. Daniel Bell linked “the coming of post-industrial society” to the rising social power of professional groups (see also Melin 2003). Robert Reich ties success in the new, global economy to “mind workers” especially trained in the manipulation of symbols (Reich 1992). Richard Florida connects the “means migration” of educated, skilled persons to a relatively small number of densely populated regions with success in the creative economy. Glaeser (2005) argues that the market value of creative people has risen, and that because “the presence of skills in the metropolitan area may increase new idea production and the growth rate of city-specific productivity levels…skilled people are the key to urban success”. His primary measure of “human capital” is years of schooling.

These and other ideas suggest that the presence of an educated workforce is a central factor in generating both urban economic growth in general and idea-generating workplaces in particular. What mechanisms connect education and creativity? A number of potential pathways may be cited, without endorsing any one of them. Increased education means that decisions are increasingly based on symbols and cultural meanings, rather than tradition or custom. Symbols are infinitely more malleable and manipulable than stuff; they can be combined in limitless ways, and can harness and control vast quantities of energy. The scientific method presses relentlessly toward new discoveries. Theories are born to be surpassed. Education opens persons to alternative ways of living and thinking, breeding a more critical stance on life that is less willing to accept the world as given. Through training engineers, computer scientists, and other more technical professionals, scientific innovation and values diffuse from universities into firms and cities more widely. Through the humanities and some social sciences, values of critique, aesthetic novelty, and “paradigm-shifting” spread (Lipset, Altbach, Shils). Mass higher education institutionalizes innovation in more organizations and internalizes it in more individuals (Clark, Admin Quarterly, NPC books). Research universities and research and development investment are strongly associated with regional increases in knowledge production (Jaffe 1989, Autant-Bernard 2001; Acs 2002; Fritsch and Slavtchev 2007). Creative designs, style, and marketing merge with technological innovation, as in the iPod. Concentrations of human capital may contribute to urban development directly though the productivity gains created by increased idea-generation by talented workers, or indirectly through spill-over effects and their tendency to raise quality of life by minimizing social problems and encouraging better schools (Glaser, Kolko, and Saiz 2004).

We can synthesize these ideas into the *city of ideas hypothesis*:

* *Cities with higher concentrations of educated individuals produce new ideas and economic growth.*

 We operationalized this hypothesis by including measures of the share of college and post-graduate degree holders, change in the share of college graduates, change in the share of post-graduates, and the location quotient of research and development jobs in multiple regression models together with the Core independent variables. We analyzed the impact of these variables on three types

of patents – entertainment patents, technology patents, and other patents – that provide the most accessible and direct indication of a city’s innovative output. We also analyzed these variables’ impacts on a number of economic development variables, such as change in total employment, per capita incomes, rent, and populations, variables often treated as indicators of the economic premium paid by firms for talented workers and by workers for access to attractive labor markets.

 [INSERT FIGURE 2]

 The results presented in Figure 2 generally confirmed the proposition, with some caveats. Zip codes with higher concentrations of college graduates in 1990 did gain jobs, add population, and increase rents. At the same time, incomes actually declined.[[4]](#footnote-4) However, incomes, as well as all of the other economic development indicators, did significantly rise in locations with *increasing* shares of college graduates. In all cases, level and growth in college graduates were positively associated with patent filing. One interpretation of these slightly conflicting relationships would be that recent college graduates are willing to pay a premium (i.e. take lower paying jobs) to live in areas with other college graduates, and other amenities, while these high concentrations of educated individuals are simultaneously dissipating as graduates progress in the life course – “settle down” and seek higher wage work, especially after attaining a post-graduate degree. This story would be equally applicable to the small college town as to Lloyd’s Neo-Bohemia, and is not at odds with the finding that increases in college graduates are associated with positive CCDV growth. Relative concentrations of research and development jobs were not significantly associated with total job growth, though the total number of these jobs was. This suggests that research and development work, regardless of the size of the industry, is connected to growth in a city’s broader economy.

 [INSERT FIGURE 3]

 *Technology*. Educated residents are clearly key factors in focalizing innovation and driving growth. Part of this impact is likely due to the fact that such residents are often skilled producers and users of high technology. However, technology may well be a significant factor in its own right, linked with its own distinct social processes. Florida (2002), for example, links creative cities not only to “talent” but also to “technology.” Acs (2002) ties high technology employment to urban success, and economists like Robert Solow and Paul Romer have long argued that technology is central to economic growth.

 Technology, however, is more than machines and enhanced craft-tools, as authors such as Heidegger (1977) and Parsons (1991) and others have argued. Technology may make cities into centers for innovation by promoting a certain outlook on existence: the world can be altered, transformed in new ways. Nature – including human nature – is not fixed once and for all.

 Critics treat technological innovation as “domination,” leading to environmental disaster, the decline of craftsmanship (Sennett 1998, Crawford 2009), and impoverished personal connection to Mother Nature. Others claim that the “technological understanding of being” goes deeper than satisfying a range of given human wants and needs. It involves a life oriented around expanding and continually transforming our possibilities (Dreyfus and Spinosa 1997). Its “instrumental-activist” value-pattern means that it is never finished; we are continuously on the move to a new understanding of self and world (Parsons 1951).

 Wikipedia, in contrast to Encyclopedia Britannica, exemplifies the difference. A Britannica article tells you how things stand with its topic. It is finished, and fixes its subject in place. It aims at mastery. A Wikipedia article is never over; one link takes you to another. It does not claim to be the last word on its subject, but encourages “wikiquests” that unfold in unforeseen directions.

 To crudely summarize, according to this line of thought, where there is more technological work, we would expect there to be more creative production and more growth. We can reformulate this idea in the form of a testable proposition, *the techno-city hypothesis*:

* *High concentrations of technological jobs and firms generate innovation and growth.*

In addition, if technology is an independent factor of creative production, this means that the education level within a city should not explain away its impacts. However, the *combination* of education and technology might well be related to innovation and growth more powerfully than each would independently.

 We tested the proposition by creating a measure of technology employment at the zip code level and analyzing the impact of technology jobs on the CCDV’s, controlling for the Core. Results are reported in Figure 4.

 [INSERT FIGURE 4]

 Places with more technology employment, we found, are significantly linked with higher concentrations of patents of all kinds, as well as with rising total population and total jobs – net of the impact of average educational level. The strong association of technology clusters but not total technology jobs with gains in college graduates is especially striking, suggesting that it is in such concentrations that the distinctively transformative effects of the technological world-view are most likely to occur. The technology variable did not suppress the impact of education. However, it did suppress the impact of population on job growth, suggesting that high population on its own is a less significant driver of expanding labor markets than the kind of work performed by that population. Somewhat surprisingly, zip codes with high concentrations of technology jobs are also significantly associated with declining per capita income and not significantly associated with changes in rents.

 *Social Climate*. Education and technology indicate the presence of skilled workers engaged in work that is especially concerned with innovation. Nurturing and attracting such persons, however, may depend on a city’s broader social climate. Indeed, many authors posit a link between, on the one hand, diversity, openness, and tolerance, and, on the other, innovation (Florida 2001, Kotkin 2001, Romein and Trip 2009). Tolerant residents, they argue, support an environment in which alternative styles, unconventional ideas, and diversity in thought and practice can flourish. New ideas are more likely to be brought to fruition and reach a public and innovative persons are likely to be attracted to them. Florida and Gates treat percent gays as an indicator of this sort of climate, not because gays are or are not particularly creative, but because their presence might indicate a tolerant city. Though Clark (2004) shows the link between gays and tolerance is spurious, as the specific impact of gays is explained by education (just as Glaeser (2005) showed that the effects of the creative class were explained by education), other more direct indicators of a generally open social climate may well vindicate the link between tolerance and creativity.

 Tolerance is just one sort of social climate, and other climates might shift the environment in which urban economies operate. For example, science is not (simply) a democracy.[[5]](#footnote-5) It does not value all contributions equally, but favors achievement, success, and results. More generally, as Tocqueville noted, “achievement” and “equality” are competing, but equally basic, democratic values (Lipset 2003). Cities with intense achievement and outcome-oriented social climates – workaholic cities – might be centers of creative production to an equal or greater degree than are tolerant cities. By contrast, if egalitarian and achievement-oriented social climates promote creative cities, communitarian – hierarchical, particularistic, and localistic – social climates might inhibit them. This is not to say that ranks and limits are “bad.” However, whatever is “good” about a hierarchical social climate – stability, settledness, security, clear distinctions between right and wrong – might be less hospitable to fostering innovation and growth.

 This line of thought would lead us to expect that cities with different social climates should exhibit differential degrees of success in the creative economy. Put in propositional form, this could suggest:

* *A city’s general social climate influences the innovativeness of its workers.*
* *A city’s general social climate impacts its level of economic development.*

We could specify the hypothetical impact of social climate further:

* *Cities with tolerant social climates generate more innovations and more wealth; they attract more residents and more skilled workers.*
* *Cities with workaholic social climates generate higher levels of economic productivity.*
* *Cities with communitarian social climates encourage fewer innovations and less growth.*

 We tested these propositions using information from the DDB Lifestyle Survey, which surveyed over 80000 respondents between 1975 and 1998 about their consumption behavior and attitudes. The results of these surveys can be analyzed at the county level (see Putnam 2000, Clark 2004). We coded the survey questions into our grammar of scenes, and treated certain sub-dimensions as plausible proxies for the above types of social climates. Our egalitarian legitimacy index provides a useful measure of a tolerant social climate. It is indicated by for instance beliefs that the father is not the natural boss of a household, that a woman’s place is not necessarily in the home, that men are not by nature smarter than woman, the desire to learn about other cultures, and interest in visiting places different from one’s home. The utilitarian legitimacy index provides our measure of a workaholic social climate. It is indicated by belief that one works late, works very hard most of the time, and spends very little time in leisure pursuits. A hierarchical social climate was measured by responses that for example indicate patriarchal beliefs, being disturbed by changes in routine, feeling that the world is changing too quickly, pining for the good old days, and opposing pre-marital cohabitation. Localism was indicated by responses like being content to live in the same town for one’s whole life, not expecting to move in the coming years, and favoring government restrictions on imported products. Neighborliness was indicated by frequently attending club meetings, working on community projects, often visiting friends, and feeling influential in one’s neighborhood.

 [INSERT FIGURE 5]

 The results reported in Figure 5 provided mixed support of the propositions. We are able to reject the null hypothesis that social climate has no connection to urban development outcomes – the values professed by a city’s residents do lead to differential results in the creative and overall economy. The proposition about tolerant social climates was largely confirmed. The counties with the most tolerant value-attitudes are likely to be home to higher patent filings per capita, and tolerant social climates are associated with population growth, job growth, as well as gains in college graduates and post-graduates (the latter slightly more strongly than the former). There was no significant relationship between tolerance and change in per capita income and median rent. The proposition about workaholic social climates was generally disconfirmed: those counties where more people work hard and play less are more likely to have lower concentrations of patents and to have exhibited declines in per capita income. They do have more overall population growth, however, and understanding better the demographic characteristics of the groups comprising that growth would be worthwhile. Still, bourgeois self-denial does not seem to pay.

 Analysis of the communitarian proposition yielded complicated results. As predicted, hierarchical social climates were associated with lower concentrations of patents and declines in jobs, as well as declines in college and professional school degree holders. Impacts on the other CCDV’s were insignificant. Localism was also generally weak, although significantly associated with areas which exhibited rising per capita income and declining college graduates. Neighborly social climates had surprisingly strong positive associations with many CCDV’s, predicting more patents of all kinds, rising per capita income, and increasing college and post-graduate degree holders. These relationships remain strong even controlling for tolerance.

 Taken together, these findings support the idea that social climate is part of the creative and economic development of a city. Tolerant social climates produced the most robust results, as expected. However, our results for communitarian social climates complicate current notions. They suggest that, even if hierarchical environments exhibit less innovation, such places can be analytically separated from those that prize personal intimacy, connection to heritage, and rootedness in place, which are sometimes associated with economic development and innovation though mechanisms worth exploring further. This finding may give some support to Putnam’s (2000) arguments about the benefits of “social capital” arising from reinforced political coordination and increased trust, even if that trust may be increasingly generated by institutions other than bowling and Kiwanis clubs (Silva and Clark forthcoming). In any case, globetrotting cosmopolitan bohemians do not have a monopoly on creativity. Many skilled workers may be at least as drawn by the promise of connection with a supportive and trusting neighborly community as by the value of tolerance. We discuss possible mechanisms and related ideas in our analysis of communitarian amenities and scenes below.

 *Social Density*. Social climate indicates the value system in which new ideas are nurtured or repressed. But the ability to communicate those ideas efficiently may be also influence urban development. Jane Jacobs famously linked the creativity of a city to its transportation and communication. Solitary ideas die; interaction with others enhances them (Mead 1967). Long commutes to and from work can be mentally deadening. Opportunities to collaborate with others may expand the ideas of all (Hoekman, Frenken and and Oort 2008). Working, living, and playing in close geographical proximity can potentially link all three psychologically; individuals might then not “shut off” outside work, but instead interact within multiple networks that stimulate new ideas. Mixing residence, work, and play may create a lively and diverse street environment, a sea of interaction sparking new ideas.

 Much work in the geography of innovation has shown that spillover effects are central to innovation (as summarized by Hoekman, Frenken, and Oort 2008). Knowledge is not easily contained in one firm, and when knowledgeable individuals change jobs (Almeida and Kogut 1999), start their own firms (Klepper 2001), or exchange knowledge informally with others (Lissoni 2001), ideas spread rapidly. Such exchanges are known to be highly geographically concentrated (Breschi and Lissoni 2001; Egeln et al. 2004). Glaeser, Kolko, and Saiz (2004) suggest, “As time becomes more valuable, individuals will particularly avoid areas where transport costs are high.” High-density places with quality public transportation may thrive in this environment, but so might low-density “car cities” with decentralized employment and quick drives to work. Florida (2008) argues that the primary contribution of cities to creativity lies in their dense communication and interaction networks providing talented persons the opportunities to meet and learn from others and to start collaborative projects. Intelligent persons stuck in Podunk, he suggests, do not have the opportunities to cultivate the skills activated by the connections available in large cities. Sassen (2001) theorizes that the success of cities rises with information flows among firms, especially around financial innovations

 We synthesize these ideas into one proposition, the *density and diversity drive development thesis*:

* *Cities with high and diverse social densities foster interactions that incubate new ideas and attract talented persons.*

We attempted to test this proposition by analyzing impacts on the CCDV’s of census measures of travel time to work, working at home, public transportation usage, walking to work, and both zip code and county population density.

 [INSERT FIGURE 6]

The results reported in Figure 6 are complex. Locations whose residents have higher average travel times to work also scored higher on many of our economic development indicators: impacts on job growth, population growth, per capita income, and rents were the strongest; there were no statistically significant impacts on changes in college graduates. Patent concentrations, however, were significantly lower in high-commute places. Still, whatever psychological pain may be associated with long commutes, it does not seem to negatively impact the economic performance of many cities. On explanation is that commute times may come from reverse commuting (Glaeser, Kolko and Saiz 2004), where persons prefer to live in high-amenity urban cores and commute to suburban workplaces; we cannot be sure. In any case, the results call for more investigation into exactly where and why the association between high commute times and urban development is so strong. We tested whether the relations change when we include tolerant social climates in the model, and for the most part they are not suppressed. Other possible interactions are explored below. If Glaeser is correct that the city of the future minimizes transportation cost, that future does not seem to be here yet, even if the connection between high commute times and declines in college graduates and lower concentrations of patents may suggest it is on the way.

 Public transportation usage, by contrast, showed the nearly opposite pattern: it predicts greater patents per capita but declining population, income, and rents. Working at home showed surprisingly strong impacts, predicting more patents per capita of all kinds, population growth, rising rents, increases in college graduates, and (slight) job growth; at the same time, incomes declined where more people worked at home. These results could suggest a general willingness in the population at large to sacrifice money for the flexibility and self-motivation historically more restricted to artists and intellectuals, as well as potential gains in creativity and economic performance arising from the diffusion of that workstyle more broadly. Walking to work is associated with more entertainment and other patents per capita, but also with population loss, job loss, and declines in post-graduates. It is not significantly related to change in college graduates, income growth, rents, or high-tech patents. Whatever positive social goods grow from walking to work, for the most part they do not seem to have translated as of yet to economic gains. Both dense zip codes and counties are associated with higher concentrations of patents, as the proposition predicts, but dense zip codes gained population while dense counties lost population, and dense counties gained college graduates while dense zip codes lost college graduates. Further, dense zip codes experienced losses in per capita income. This may indicate a demographic shift in the inhabitants of dense zip codes (i.e. urban areas) away from the college educated, even though the number of college educated individuals appear to be growing in relatively dense counties. These results suggest a need to modify the observation, noted by many, that much U.S. growth has occurred in less dense suburban and exurban communities, in particular to investigate density at different geographic levels and in reference to different sub-populations.

 These results are for the most part inconclusive. In general dense concentrations of human beings in one place do seem linked with innovative production and growth, though not exclusively, and not necessarily through the mechanisms outlined by the above theories. Nevertheless, these issues merits further study. For one thing, analysis of the interactions of these forms of density is required. For another, we could explore Geographically Weighted Regression techniques in order to investigate how national patterns may shift in some sub-areas. Finally, we might well consider other indications of dense and varied interaction environments, such as employment density, demographic diversity, land-use mix, mixed age of housing stock, and block size. We are pursuing further analyses along these lines, much of which is reported in Knudsen and Clark (2009). Still, this very inconclusiveness leads us to ask whether it not only matters *that* places contain dense human concentrations but also *what* such people are doing.

 *Artists*. Education, technology, social climate, and social density are all important factors that drive urban development in different ways. But the presence of a critical mass of working artists might be a further factor, not reducible to these others. Artists deserve extra attention as they are quintessential creatives, masters at taking material from the world – stone, color, sound, etc. – and refashioning it into a new perspective on the human experience. Beyond this broader notion of artistic creativity, the more narrow avant-garde sensibilities of novelty and contingency, as Daniel Bell has argued (1996), have in the past century come to dominate the cultural sphere in general and artistic work in particular, though there are exceptions.

 How might the presence of artists play a role in a city’s economic development and innovation? Most straightforwardly, concentrations of artists indicate concentrations of individuals devoted to creative endeavor as a primary value governing their activity, even if that ideal is rarely realized. Moreover, artists often become linked with specific cities, perhaps helping to define those cities as special sites of creative inspiration: Saul Bellow in Chicago, Allen Ginsberg in San Francisco, Bob Dylan in Greenwich Village, Baudelaire and Balzac in Paris, Kurt Cobain in Seattle, John Steinbeck in Monterey, Georgia O’Keefe in Santa Fe, Rembrandt in Amsterdam, Kafka in Prague, and more. Whatever drew these artists to these places initially, such connections between artist and city might well help to sustain these cities as muses for others, attracting tourists and residents as well. Chicago is stimulating because residents and visitors can draw on Bellow’s representations of it; Monterey, CA is a special haven for creative artists because John Steinbeck romanticized its past.

 Not only does artistic endeavor lead by itself to creative outputs like paintings, novels, musical works, but artistic work is embedded within “art worlds” (Becker, 1984) that employ many others in creative work – from stage managers to museum staff to art dealers. Post-industrial workplaces increasingly resemble artists’ studios in many ways, not least in that they require many artists for services, such as graphic designers, web designers, product designers, marketers, voice-overs, or advertising copy editors (Markusen and King 2003). Artists sell their work to local firms, creating a more stimulating and interesting work environment, and sometimes lead workshops for employees. High concentrations of artists contribute to high quality of place, attracting skilled workers and new businesses to interesting artist neighborhoods and cities (Florida 2002, Markusen and King 2003, Lloyd 2006). Moreover, the significance of artists in the broader cultural and creative economy highlights the extent to which trade in ideas is more than science, engineering, and education. Arts, culture, and humanities institutions like galleries and museums and musical venues are also primary generators of new ideas and styles, whose import is heightened as cultural production expands and becomes integrated into broader societal institutions (Peters and Besley, 2008). The widespread increased use of “design” as a term in even traditional industries shows the rise in sensitivity to aesthetic concerns (e.g. Daniel Pink’s *A Whole New Mind* (2006)). In sum, if one were founding a new city in the early 21st century, an artist colony might provide the greatest growth potential.

 Without suggesting that the value of the arts is reduced to their development effects, these ideas about the impact of artists on urban economies still imply the *artist as economic engine thesis:*

* *Locations with more artists should generate more total jobs, attract educated workers, and lead to more creative output from the economy.*

This simple proposition was confirmed fairly powerfully in our analysis. We computed a measure of employment in artistic occupations using census data, the components of which are summarized in the Appendix.

 [INSERT FIGURE 7]

 We analyzed both the total numbers of arts jobs and the local proportion relative to the US national proportion (the “location quotient”) at the zip code level. Net of our core control variables, higher concentrations of arts jobs are associated with higher concentrations of entertainment and high-tech patents, overall job growth, population growth, and (relatively large) gains in college graduates; they are not significantly associated with change in per capita income and rents. The impacts of total arts jobs are broadly similar, except that their association with population change is not significant and they are connected to declining incomes. This may be the difference between clustered artistic communities within a larger economy and truly independent artistic economies whose lower average incomes are more observable, though there is no way to be certain. That incomes declined and rents were unrelated to arts jobs complicates typical gentrification stories, which are all too often based on anecdotes from New York City or San Francisco. In the country as a whole, artist neighborhoods, in other words, are linked to broader local economic growth and regional innovativeness without at the same time raising local rents or incomes. These impacts were not suppressed when we added social climate and public transportation usage to the model.

 While this analysis is gross, it extends current work, and the strength of the results is striking. Given the small size of the artist population, one might imagine that the artist effect would be swamped by the controls, which, to remind, include education, population, race, crime, and party voting. Glaeser (2005) found that at the metropolitan level the impact of artists was largely reducible to education and a few outlier cases. Since our analysis is at the zip code level, it is not subject to the same concerns. Artist neighborhoods are growing, and cities that contain them are producing more patents.

 Still, we, like other authors who have empirically studied the connection between artists and creative cities, have focused on artists as a monolithic group. But different kinds of artists might be linked with creative cities in different ways, and some not at all. Sleepy Carmel, CA is home to numerous landscape and pastoral painters. But Carmel is not a center for creative industries like software design or biotechnology. Large numbers of graphic artists might feed into design and advertising jobs, adding value through their creativity to firms’ output, but the High Art tradition may foster values opposed to economic success, technology, and the market. And we know that types of artistic occupations are not distributed evenly across space (Hill 2009). Artistic creativity may be channeled in many directions, the preponderance of which are not indicated by or defined by patents – an acknowledged limitation in not only our data. But the rich case studies of neighborhoods like Greenwich Village omit control variables. Geographers of innovation have long sought better indicators than patents, and so far have been unsuccessful. We are pursuing analysis of propositions that flow from such considerations with such data as we can find, but are not yet in a position to report on the results.

*Nature*. Even if the type of work performed by a city’s residents does strongly impact its creative production and economic growth, *what* is there – the natural and built environment – might matter as much or more. Consider the natural world. A long cultural tradition holds that nature itself is a source of creativity. Kant argued that aesthetic appreciation of nature’s beauty provokes a spontaneous play among our faculties that cannot be reduced to rules. He also wrote of the sublime experience of awesome mountains and oceanic depths as shattering our sense of stability and settledness. Romantics celebrated the wilds of nature, seeing in its unpredictability a source of creativity beyond rational calculation and aesthetic harmony. Transcendentalists saw in nature an expression of the divine whole that could be mixed with human will in the production of art.

These and other cultural and intellectual traditions suggest that cities with natural assets might inspire distinct forms of creative work. For example, Van Ulzen 2007 suggests that many architects and designers choose to live in more industrial Rotterdam over more tourist-oriented and cultural Amsterdam because of Rotterdam’s port city image and the inspiration provided by “the rhythm of the river.” The proximity of the Bay Area to crashing waves and Redwoods, of Los Angeles to inviting surf, and Denver to the Rockies may well provide independent stimuli to and resources for the distinct sorts of creative work by residents of these cities. Cultivating the beauty of viewing and the pleasure of playing in Lake Michigan has arguably been one of the central pillars of Chicago’s recent urban cultural policy successes.

Moreover, natural amenities such as warm weather and opportunities for outdoor recreation may strongly influence migration patterns of different types of people with different aspirations, such as the desire to be an active outdoorsy person (Brooks 2000, Glaeser, Kolko, and Saiz 2004). Populations in U.S. Sunbelt cities are booming (pre-financial melt-down, at least), primarily among older persons (Clark 2003). Kotkin (2000) suggests that natural assets are less attractive to creative talent who prefer the action of central cities.

We tested some propositions that flow from these considerations:

*The warm to growth thesis*:

* *Warm climates encourage population growth.*

*The weekend warrior thesis:*

* *Access to natural and waterfront amenities attracts some skilled workers and stimulates creative work.*

[INSERT FIGURE 8]

We analyze impacts of several natural amenity variables on the CCDV’s. Average January and July temperatures measure warm climates. The USDA index of natural amenities (of water, mountains, and more, information on which can be found in the Appendix) gave us an overall indicator of access to nature. We created an index of waterfront amenities from our amenities database which included places with lakes, rivers, and oceans as well as marinas, beach accessories, boat charters, river trips and tours, and waterfront food service.

The results are complex, but strongly support the proposition that the natural environment impacts the creative and economic fortunes of cities. The most consistent result is that cities with warm weather climates, waterfront amenities, and natural amenities are generally *less* likely to produce higher concentrations of patents than are other cities, the exception being the fact that both the natural amenities index and the waterfront amenities index have a positive association with entertainment patents and higher mean July temperatures are associated with more high-tech patents. Whatever stimulant warm climates provide to creative production, it often seems to lead to some product other than patents; access to nature, by contrast, does seem to create an environment conducive to the creation of novel cultural products. At the same time, warm climates and waterfront areas have experienced strong population growth and rises in rents. In addition, places with more waterfront amenities saw increases in per capita income.

 The impacts on workforce education varied. College graduates decreased in places with many natural amenities and higher average January temperatures but increased in places with many waterfront amenities and higher average July temperatures. This suggests at the very least that nature means different things to different people, perhaps varying on the basis of the amenities in terms of which that relation is constructed. However banal this idea is, it opens the door to significant new lines of thought.

In other analyses (not reported here), we have found, for example, that natural amenities at the city and zip code level do not attract young people but do at the metropolitan level. This result could suggest that relatively easy periodic access to nature within an urban ecology may be more important to this group than living with nature at the back door. Moreover, it may be the case that the impact of nature on innovation is not direct but mediated through the people it attracts, who are in many cases the highly educated persons we know often are associated with creative output – a proposition we are currently testing using path analysis. In any case, the impact of the weather on shaping urban fortunes cannot be discounted.

*Scenes*. But nature is not destiny. To a large measure, a city’s built environment defines its qualitative feel, what there is to do, see, and experience. Beautiful buildings may provide an “aesthetic edge” to some cities, and urbanism as such may be attractive to many high human capital consumer-residents (Glaeser, Kolko, and Saiz 2004). Concentrations of spaces and places devoted to sociable consumption transform residential and work districts into animated scenes that unfold in amenities like cafes, galleries, theaters, clubs, bars, restaurants, boutiques, and museums. Scenes enliven the street and provide opportunities to interact on the basis of shared tastes and experiences. They are growing in importance (Glaeser, Kolko, and Saiz 2004) as social groups are increasingly based on personal meanings rather than primordial ethnicity, class, national background, or religion (Silver, Clark, and Navarro 2010). In Toronto, for example, though population grew rapidly over the past forty years, the average household size shrank (Bourne 2010). Downtown condominium building booms generate influxes of new residents for whom the restaurant is the dining room, the café the living room, the music club the meeting place, and the park the back yard (Hume 2010).

 Scenes can spring up around particular arts and amenities like music, dance, or fashion (Peterson and Lena 2009, Currid 2007, Urquia 2004). But a music, dance, or fashion scene is typically about more than music, dance, or fashion. It enables participants to cultivate valued experiences, such as individual self-expression, ethnic authenticity, or glamorous self-display. Silver, Clark and Rothfield (2006) and Silver, Clark, and Navarro (2010) develop a set of analytic dimensions designed to capture the range of experiences that scenes can cultivate, reproduced above (Table 1). This approach treats the scenes of urban life less as a series of opposed Types – like Nerdistan vs. Bohemia – and more as a matter of a range of analytic elements – self-expression, transgressiveness, charismatic authority, local authenticity – that combine in numerous ways. These meanings are projected and promoted by the amenities that dot a city’s streets and strips.

 Many authors have linked the presence of urban scenes and collections of amenities with urban development. Many see their value in their attractiveness to skilled workers. Kotkin (2000) distinguishes between the different built environments attractive to “nerds” and to young childless couples, linking the relative fortunes of different cities to their ability to attract these different groups. Central city cultural areas are attractive to creative workers because “that is where the action is” (Kotkin 2000). Florida (2002) suggests that experiential and participatory amenities like bike paths attract the creative class. Glaeser (2005) suggests that cities grow by providing “the basic commodities desired by those with skills”. Though he does not find any connection between art museums and county population growth, he does find that amenities appealing to “high human capital workers” like live performance venues and restaurants significantly predict population growth, while “amenities appealing to low human capital workers – bowling alleys and movie theaters – are both negatively associated with later county population growth” (Glaeser, Kolko, and Saiz 2004). Clark 2004 stresses that the attraction of different amenities varies across sub-cultures. Though population in general does grow in amenity-rich places, college graduates are more numerous where there are more constructed amenities like brew pubs, operas, juice bars, Starbucks, Whole Foods, bicycle events and museums; they are less numerous where there are more natural amenities. For the elderly, the situation is reversed: they are rising in places with more natural amenities and fewer constructed amenities. Residents ﬁling high tech patents, he finds, live in places with more natural *and* constructed amenities.

 Others have analyzed scenes as more direct engines driving “the city as an entertainment machine,” hypothesizing mechanisms through which scenes add value to the production process beyond attracting skilled workers who would *ex hypothesi* be just as productive somewhere else. Landry (2000) writes of the importance of “third-spaces” like cafes, restaurants, clubs, bars, record shops and bookstores for “creative cities” in that such spaces foster stimulating communication between people (Landry 2000: xxiii). Some scenes may facilitate the sorts of “buzzing” face-to-face interactions and vibrant milieus that Storper and Venables (2002) show are crucial to success in coordinating, sustaining, and enhancing creative work that lacks pre-defined scripts and rules (see also Huysman, Elfring, and Bahlmann 2009 and Bathelt, Malmberg, and Maskell, 2004). The glamour of the fashion scene in New York and the film scene in Los Angeles heightens demand for the products they produce, generating independent economic value (Currid 2007). Persons not only move to places because there are certain amenities there; participation in those amenities enables them to live out and actually become the types of persons they wish to be (Silver, Clark, and Rothfield 2006). Being in a place with many self-expressive or glamorous or traditionalistic amenities makes it more likely that one will meet self-expressive or glamorous or traditionalistic people, have experiences of the majesty of glamour, the uniqueness of the expressions of a self, or the power of a tradition, and commit to making the lifestyles associated with those experiences a part of one’s identity and social connections. People can abstractly value glamour while living in many places; but in Los Angeles, for example, it is uniquely possible to exist in a glamorous way and become a glamorous person. Thus, even if many talented people move to cities in part because of their amenities and consumption spaces, participation in those amenities may generate independent effects.

Another strand of research focuses specifically on bohemian scenes. What kind of connection might join bohemian neighborhoods and urban development? Bohemias are more than artistic enclaves. Most bohemians are not themselves artists, but dress, speak, and consume in an “artsy” way (Grãna 1964). From the beginning, Bohemian neighborhoods were significant not only for the art they produce; they spatially concentrate individuals against The Establishment, producing a common mood of transgressing the rules in a quest for unusual, exotic experiences. Bad is Good: crime, marginal groups, drugs, may all be positively valued. Silver, Clark, and Navarro (2010) indeed find that bohemian amenities are more common in high-crime areas, though the impacts of such scenes vary a great detail in different contexts. Bohemias often arise in and celebrate transitional, liminal moments in the life of a city: Hausmann’s Paris in the mid-19th century, Greenwich Village and Haight-Ashbury in the 60’s, Daley II’s Wicker Park in the 90’s, Toronto’s West Queen West during its early 2000’s “cultural renaissance.” Bohemias are always already dying, mourning the loss of a special authentic moment in the past. They are beset by “constitutive nostalgia” (Lloyd 2006), and so always restlessly moving within the crisis moment between sunset and sunrise, Old and New. Bohemias crystallize in a place the spirit of transgression, but they need not be revolutionary – Marx, Benjamin, and Sartre criticized bohemians for being more concerned with etiquette, manners, and experiences than with transforming the economic bases of society.

All of this makes bohemian neighborhoods – filled with used clothing boutiques, late night bars, tattoo parlors, smoke shops, galleries, ethnic restaurants, marginal individuals – highly suitable as laboratories for generating new consumption styles. Analogous on the consumption side to scientific R&D on the production side, they are integrally connected to, and not necessarily in combat with, a creative economy that expands in that it generates new demands (Campbell 1989). Where it is important for firms to be on the cutting edge and to appeal to youth, edginess, difference, otherness, and retro style, then the presence of a Bohemia could provide vital inputs. Bohemias provide growing cultural economies with “useful labor” (Lloyd 2006) – not only in the form of artists and designers, but also in all the highly educated support staff, marketers, and executives who can go to the bars and find out what is hip (Currid 2007). They can consume on the edge of accepted conventions, without themselves having to be artists or revolutionaries. Thus, the presence of thriving bohemian communities could add to the creative workplace by providing relatively safe spaces for a more educated workforce that has internalized avant-garde culture.

Here are some of the propositions that should hold if these ideas about the economic consequences of scenes are correct. At the most general level, we would expect that

* *Variations in local amenity mix lead to differential urban development outcomes*

Specifying the proposition a bit more on the basis of the concrete type of scene yields the following:

* *Urbane scenes facilitate innovation and attract highly skilled workers.*

Stressing specific scene dimensions often considered crucial suggests:

* *Highly glamorous and individually self-expressive scenes add value to urban places over and above their general urbanity.*
* *Scenes that stress communitarian values attract specific sub-populations and generate distinctive patterns of urban development.*

If we focus on the proposed economic consequences of bohemian scenes, the following propositions should hold:

* *Bohemian scenes promote novel ideas, attract young college graduates, and generate more employment in the broader economy.*
* *The impact of bohemias is contextual and is greater when they exist in sharp contrast to alternatives.*

 We tested these propositions using the various measures of scenes we have developed using our national database of urban amenities. To assess the most general propositions about the importance of amenities, we analyzed the impact of the strongest factor on which the scenes dimensions load. This factor, as mentioned above, measures the relative “urbanity” or “communitarianism” promoted by a place’s amenities. We assessed the more specific propositions about single dimensions of scenes by analyzing their impacts on the CCDV’s. Sample indicators of each dimension are in Table 1. We measured bohemian scenes with the index of bohemian amenities outlined in Silver, Clark, and Navarro (2010) and in the Appendix.

 [INSERT FIGURE 9]

 The results reported in Figure 9 are powerful. The general feeling of urbanity expressed by clusters of amenities was significantly and positively associated with job growth, income growth, and gains in post-graduate degree holders. It was associated with declining rents, and not statistically significantly connected with patents population growth, and change in college graduates. The most general dimension of the American scenescape – Gemeinschaft vs. Gesellschaft – is a significant factor that influences urban development trajectories. Nevertheless, as Talcott Parsons pointed out (Parsons 1951), there is significant room for variation within and between these forms of association. The insignificant relationship between urbanity and change in college graduates for instance might suggest that this group is sensitive to distinctions among different types of urbanity; the insignificant relation to patents of all types might suggest that urbanism as such is less important than specific types of experiences (e.g. self-expressive or glamorous) for facilitating interactions likely to generate innovative products. And the impacts of Bohemia (discussed below), which includes dimensions that are both communitarian and urbane, suggest that a significant aspect of urban experiences takes place at the intersections of Gemeinschaft and Gesellschaft.

 Indeed, scenes that promote experiences of individual self-expression were significantly and positively associated with *all* CCDV’s except for high tech patents, which were significantly associated at the α = 0.1 level. Self-expression is the only variable we tested –including growth in human capital – that was associated with patents of all kinds, increasing population, rents, income, total jobs, and human capital. Glamorous amenities were positively linked with all CCDV’s except for change in total jobs and post-graduates. In fact, both glamour and self-expression suppress the impact of college graduates on population growth. They also suppress the impact of urbanity on change in college graduates, suggesting that such persons are responsive to exceptionally glamorous and self-expressive areas and not necessarily to the general urbanity found in many places. Post-graduate degree holders, by contrast, increased in urbane places but not in glamorous places, suggesting a “square” factor in urban development patterns. These seem to be separable effects: the correlation between glamorous and self-expressive amenities is relatively low (r = .23), and putting them in the same model does not significantly alter any of the above relations. For some outcomes, that is, glamour and self-expression each heighten the scene generate value all their own.

 The results of our analysis of some of the specifically more communitarian aspects of scenes were surprising. These are the places full of the amenities that some Harvard professors label “low human capital.” And traditional amenities are in fact significantly associated with declines in per capita incomes, as are neighborly amenities, which are also modestly associated with declines in post-graduate degree holders. And yet: amenities of local authenticity are positively and significantly – if weakly – associated with gains in college graduates, while neighborly amenities are significantly associated with rising rents. Not only theaters and restaurants but also bed and breakfasts, golf courses, and local bakeries appeal to skilled persons. Still, for the most part, the communitarian dimensions do not exhibit statistically significant relationships with most of our economic development variables. The most surprising exception is patents: neighborly amenities are significantly linked with higher concentrations of high-tech and other patents; locally authentic amenities are linked with entertainment patents and other patents. The cities producing the most patents are highly likely to contain highly neighborly and locally-oriented communities.

 This finding went so much again the standard story of edgy creative class domination that we decided to investigate it further to determine if the result was spurious. It seems not. Rather, it seems that the standard picture is biased by the strong relationship between rents and patents. When we exclude rents from the model, the association of neighborly and local amenities with patents is negative. However, when we add rents, the relationship reverses: local and neighborly amenities are significantly associated with higher concentrations of patents. We performed many tests to check whether this result is mere statistical noise or whether it carries substantive meaning. It appears to be the latter.

 Interpretation? Many urban economists have noticed the strong positive relationship between high rent districts and creative industry clusters. Silicon Valley has very high rents, and many firms and individuals continue to move there, even when rents would be cheaper in Nevada. Why? They typically point to spillover effects, where locating near other innovating firms and individuals increases the productivity of everybody; the whole is greater than the parts. Others have posited a signaling process, whereby high rents signal to firms and workers that productive, talented workers are likely to be located there; a sorting effect (Marcus and Yu, 2009). Others, as we saw, have suggested a premium on certain consumption amenities, like theater and restaurants (Glaeser, Kolko, and Saiz 2004). High human capital workers are willing to pay higher rents to gain access to these sorts of amenities and the other high human capital people likely to frequent them; low human capital amenities are correlated with lower rents and less skilled people.

 Our finding complicates this story. If we only look at the simple bivariate correlation between local and neighborly amenities and patents, for example, we see a negative relationship between the two. There seems to be less patent production in places with more amenities like historical sites, family restaurants, parks, civic and social organizations, bakeries, fruit and vegetable markets, libraries and archives, playgrounds, coffee houses, pubs, cemeteries, antique dealers, churches, and historical societies. However, once we control for rents, the relationship reverses: places that provide connection to and express the value of a tradition and neighborliness are actually positively and significantly associated with more patents. The fact that such places tend to have lower rents biases our view of them (the correlation between rental prices and neighborly amenities is approximately -.2, for instance). If we take out the effect of high rents – whether due to sorting, spillover, or high-priced amenities – then we can see that a lifestyle rooted in the local and committed to community via scenes composed of amenities that express and enact the values of local authenticity and neighborly theatricality is perfectly consistent with innovative work.

 Further investigation is required to detail specific mechanisms. But consider two hypotheses, one that proposes indirect and one direct mechanisms through which such scenes encourage novel ideas. The promise of a local community lifestyle may attract high skilled workers to more rural or neighborhood settings, “compensating” for the loss of the high-rent prestige of Silicon Valley, Los Angeles, or New York City with a lifestyle full of neighborly and locally authentic amenities. In fact, some land-grant universities like University of Wisconsin-Madison and Virginia Tech have been actively pursuing this strategy in collaboration with their local governments. The presence of such workers could then lead to more innovation. Yet interacting with this may be a more direct mechanism connecting local roots and neighborly interaction to innovation, cultivating sensibilities for certain sorts of creative work. The security of a life connected organically and intimately to a community of neighbors who “know your name” can provide a firmer backdrop and support for inevitable failures and risks of all creative endeavors. The best new knowledge can be like the best food: it comes slow, not fast, and is organically connected with a set of local practices. It finds nourishment in extended conversations that unfold over years, working from out of but not against its history to find insight not in abstract, disembodied universal processes but in the particular dynamics of a concrete place. The availability of life in neighborly and local scenes may enable these sorts of ideals to form the basis of everyday personal and social experience. This links to the two sorts of innovation identified by Galenson (2007): youthful brilliance and elderly synthesis.

 What about bohemia? An equally complicated picture emerges. At the national level, patents are not more likely to be filed by residents of cities with strong bohemian scenes. Nor are bohemian scenes attracting college graduates or experiencing rising rents or incomes. They are, however, showing increased jobs and population. Moreover, the bohemian index suppresses the impact of our measure of general urbanity on population growth. These results again complicate the simple stories of gentrification and Red State vs. Blue State.

 [INSERT FIGURE 10]

 Given the highly contextual nature of bohemia, national analysis may be less revealing than how bohemian scenes vary in specific local contexts. If Bohemias are liminal spaces between the passing of an Old World and the emergence of a New, their impact should be greater when embedded in more communitarian contexts. We tested this idea by creating a variable using the county mean of our scenes factor score, which we treat as an indicator of the degree of urbanity or communitarianism of the county as a whole. We then split our national file into quintile groups based on this measure, and analyzed the impact of bohemian amenities within each quintile.

 [INSERT FIGURE 11]

 The results reported in Figure 11 are highly suggestive. Bohemias are not significantly linked with entertainment patent filing nationally; however, they *are* in its less urbane segments, and they are associated with lower concentrations of entertainment patents (and high-tech patents) in, and only in, the most urbane areas. Moreover, though nationally bohemias predict increases in total employment, this effect is almost entirely contained within the middle and second-most communitarian group of counties in the country. And though nationally bohemias are experiencing population growth, this growth is mostly within the most communitarian quintiles and is absent in the most urbane segments of the country. A similar pattern emerges for the relationship between bohemias and income growth: while bohemias do not predict increasing incomes nationally, they do in the lower quintiles, and their impact declines in linear fashion until, in the most urbane parts of the country, they are associated with declining incomes. The relationship between bohemias and rents shows a similar, if less linear, pattern.

 These results offer strong confirmation of the notion that, for example, Lloyd’s observations of Wicker Park’s rise in the 1990’s are not unique to Chicago but may instantiate a general phenomenon. Bohemias play a pivotal role in the early phases of a city’s “expressive revolution,” where formerly blue-collar and bourgeois cities or neighborhoods experience their first, transitional reverberations of the tradition of the new. But as that revolution becomes institutionalized and thereby moderated, the contrast between “establishment” and “radical” minimizes, and specifically bohemian neighborhoods stand out less (Silver and Clark, in draft). One potential indication of this developmental sequence is given by the fact that post-graduate degree holders – harbingers of the establishment – actually increase in bohemias located within the more urbane parts of the country.

 Though not conclusive, these analyses of amenities and scenes suggests that, as many of the authors above have argued, an independent “scene effect” generated by the experiential opportunities provided by local amenities. The economic effect of scenes may be partly driven by the process through which some scenes attract skilled workers, by providing them occasions for personal self-expression and rootedness. But human capital attraction does not seem to exhaust the impact of the scene: when we include change in college graduates in the model with self-expressive and neighborly scenes, the scene effect is not suppressed. Scenes add independent value to urban economies. They invest products made by their participants with the charge of glamour. They expose residents to interactions devoted to the search for new ways of thinking and being; they connect them to community, and to a sense of place.

*Interactions*. The above analyses focused largely on the separate impacts of each potential factor of urban development. Yet these factors interact with one another. The fortunes of a dense walkable neighborhood shifts when combined with a locally authentic scene. Scenes coupled with working artists differ from those with few artists. Nature transforms different amenities. And, as we saw most precisely for bohemia, scenes impacts shift according to their relation to other scenes. Given that our focus is on scenes, we investigated three hypotheses about how scenes as spaces of sociable consumption build on and enhance the other factors of creative production.

Though every factor theoretically interacts with scenes in significant ways, we report on four results. One potential interaction is the intersection of scenes and neighborhood walkability. A neighborhood may be walkable in the sense that many people walk to work or take public transportation and are therefore more likely to move about among many amenities in close proximity. But that alone does not convey the feel of the neighborhood – an equally high Walk Score can be achieved on walk.com, for example, via many McDonalds or many local bakeries.

A second interaction we investigated joins scenes and technology industry clusters. A city may contain large concentrations of technological work, but without diverse scenes, the spillover effects noted by many geographers may not occur. People need places to interact informally, places whose experiential qualities heighten those interactions. Amenities promoting the value of spontaneous self-expression may better facilitate the informal interactions that add value to technology firms.

A third interaction concerns nature and scenes. Though proximity to mountains and beaches may provide advantages to some cities, others with fewer natural amenities may compensate via amenities generating a sense of rootedness in an authentic place. Jim Brainard, Mayor of Carmel, Indiana, puts this proposition clearly: “We have something La Jolla doesn’t have. It’s called ‘diversity of weather.’ But we have to be able to compete with those places. We don’t have the Pacific Ocean, we don’t have the Rocky Mountains. So we have to work harder on our cultural amenities and in our built environment to make it beautiful – and to make it a place where people want to choose, to spend their lives, raise their families, and retire…”[[6]](#footnote-6)

 We investigated these three propositions about interactions between types of scenes by exploring the following hypotheses.

* *Walkable neighborhoods experience distinctive development outcomes when they feature scenes of local authenticity.*
* *Technology industry clusters are more likely to lead to growth and innovation when they are located amidst amenities that promote experiences of self-expression.*
* *Amenities that highlight local authenticity are more likely to impact urban development in places with fewer natural amenities.*

 [INSERT FIGURE 12]

 Analysis of quintiles yielded some intriguing findings. We report here on the strongest patterns, but caution that many of the relationships are not as clear or coherent as these. Nevertheless, scenes and neighborhood walkability do interact in significant ways. At the national level, the local authenticity of a scene’s amenities is not significantly related to variation in job growth and is weakly tied to population growth. However, within the zip codes with the largest shares of residents who walk to work, local authenticity is positively related to both job and population growth. Local authenticity has no effect in the places where fewer people walk to work.

 [INSERT FIGURE 13]

 Self-expressive scenes do seem to enhance the gains associated with technology clusters. As we saw, in national analysis clusters of technology jobs are positively related to patent concentration, job growth, population growth, and human capital gains, while they are negatively related to rents and incomes. However, these effects are strongly mediated by the self-expressiveness of the amenities nearby technology jobs. The relationship between technology industry clusters and entertainment and technology patents is entirely contained within the two most self-expressive segments of the country. A similar pattern can be seen in the associated between these clusters and change in college graduates, with the exception that a positive relationship exists between the two in second lowest quintile of self-expressive scenes in addition to the two top quintiles. Their association with job growth is significant *only* within the most self-expressive quintile, their association with population growth is significant *only* in the second-most self-expressive quintile, and their association with post-graduate gains is significant *only* in the most self-expressive quintile. Technology clusters may play a part in the new urban economy, but that role seems to be significantly dependent on such clusters being located amidst scenes that provide occasions for spontaneity, improvisation, and unique expression.

 [INSERT FIGURE 14]

 Scenes of local authenticity are related to different urban development outcomes depending on their proximity to natural amenities. Nationally, locally authenticated amenities are associated with higher concentrations of entertainment and other patents, rising college graduates, population, and income, and are not significantly associated with the rest of the CCDV’s. However, the impact of local authenticity shifts depending on the natural amenity context. The positive relation between local authenticity and both income growth as well as high-tech patent concentration, for example, is significant *only* in the 20% of the country with the fewest natural amenities. The positive association with gains in post-graduate degree holders is *only* (barely) significant in the lower quintiles. It is *not* significant or *negative* in the sections of the country with the most natural amenities. Local authenticity is tied to growing numbers of college graduates in the places with the least and most natural amenities, not the ones in between. There might be something to Mayor Brainard’s intuition. Amenities can both enhance a natural setting, and compensate for limited access to natural amenities. Scenes shift the effects of other urban development variables, and are themselves shaped by their context.

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 Max Weber was fond of using the phrase “every man a monk” to characterize the world-historical implications of the Protestant Reformation. It threw open the walls of the monastery, injected its ascetic element into everyday life, and offered positive religious backing for the focused, disciplined, rational exercise of mundane activities like work and household management. Normative ideals formerly restricted to religious virtuosi were extended to a wider population, tremendously expanding and deepening the personal religious commitments and experiences available to them. Heightened expectations of disciplined performance as an everyday occurrence, outside of specialized settings, generated new anxieties and conflicts. And, most fatefully, the productivity gains for which the “disciplinary revolution” (Taylor 2007) was partly responsible placed the rest of the world in its steel shell. If Calvinists pursued work with the ascetic zeal of a religious calling, others for whom worldly toil was a burden were forced to work harder or move aside.

 Our investigation of the conditions most likely to lead to urban growth in the contemporary world might be interpreted as suggesting that the process Weber identified has moved to a new level. “Every man a musician” could describe it in general, if not the most accurate, terms. The walls of the Lab, Lecture Hall, and Latin Quarter have been thrown open, injecting the expressive and creative element into everyday life. Practices and sensibilities formerly restricted to creative virtuosi have been extended from the garret, studio, and study to boardrooms, city halls, office cubicles, and main streets nationwide. This marks a great upgrading of the expressive and creative possibilities available to the general populace. It also subjects more individuals to previously more exclusive anxieties oriented around the quest for authenticity and the demand to construct meaning for oneself.

 And, perhaps just as the rise of the Protestant Ethic did before it, the current institutionalization and internalization of creativity, as the present chapter documents, has transformed the economic playing field. That process has put a premium on the ability to generate new ideas and styles. Places that best facilitate idea and style-generation are succeeding, though this success cannot be attributed to any single factor. Education is important, but so are basic research, technology, and artistic work. Tolerant social climates create environments that are more open to experimentation and attractive to the most skilled workers. Hierarchical social climates seem to stifle innovation and growth; they are losing college graduates and generating fewer patents. Workaholic social climates leave their residents little psychological space to reach beyond the analytical mind into modes of experiences not accessible to rationalism. And finally, the places that have filled their streets and strips with opportunities for unique expressions of individuality and glamorous theatricality are not only attracting the most educated and talented, they are adding value to that talent. This is a world that Weber would have hardly recognized.

 Has it thrown up an iron cage of creativity? Innovate or Die? Bohemia or Bust? There is no one, clear answer in these data. We can say that places that encourage residents to express and glamorously display themselves, while at the leading edge of the creative economy, do not have a monopoly on innovation or growth. Some places with neighborly social climates that enable persons to connect with a heritage are growing and innovating; they may create networks of continuity, support, security, and trust that make the unavoidable uncertainties of creation tolerable. Some places that root residents in the local or put them in contact with nature are growing, innovating, and attracting persons with education and skills. Nashville’s Country Music industry rivals music industries in New York and Los Angeles. Yet each city’s musics feed on the strikingly different amenities and scenes in which they are embedded: three of the five most abundant types of amenities in Los Angeles are jewelers, bakeries, and commercial artists; in New York the top categories include jewelers, delicatessens, and art dealers. Some of the most numerous amenities in Nashville are automobile customizing services, Methodist churches, and the Church of Christ. God and Cars can fuel cultural production as much as Bling, Art, and Lunch On the Go.

 *Conclusion.* Both analysts and policy makers, we suggest, might advance by paying more attention to scenes. We show several powerful impacts of scenes components in this chapter, some simple, others complex. We have shown here too how to measure and analyze scenes dimensions in terms almost as precise and concrete as education or income and other classic variables that we include in our “core” analyses, building on previous studies. In the new economy where consumption and production more often join, we have shown how specific scenes components can generate synergistic results. We have done so by using the same basic policy variables as in the best recent work, widely stressed and studied by others: changes in population and jobs, increases in income and rents, the rise of college and post graduate persons, and patents.

 But we have dug deeper into many dynamics by modeling these processes using some 40,000 zip codes, as well as combining the zip code processes with larger units like counties where appropriate. Some scenes results then dramatically emerge: glamour and tradition can generate innovation and growth, just as can bohemia. Bohemian processes do not work everywhere: they are strongest in areas that seem to be breaking with tradition, taking off in artistic and economic activity, as measured by our scenes factor score. Bohemian impacts are nil in many other places. Localism and walking can shift how other processes operate. Some places that seem left out of the “creative economy” still successfully build on their distinctive assets and lifestyles. Localism is most powerful in its positive effects precisely in locations that have less of other things, like grand mountains or urbane nightlife. There are many contrasting ways to be creative. Analysts and policy makers who attend to these more subtle combinations of classic processes can make more informed decisions.

1. In focusing here on the links between scenes and economic growth, we in no way endorse the proposition that economic standards are the only or primary measure of the value of scenes. Scenes have their own autonomous standards of value that evaluate economic standards; scenes also contribute to arenas beyond the economic, such as neighborhood cohesion or political mobilization. For a study of scenes as one symbolic resource among others, see Silver and Clark, 2009). [↑](#footnote-ref-1)
2. http://leisureblogs.chicagotribune.com/the\_theater\_loop/2009/10/new-nea-chief-lauds-daley-arts-policy-says-model-for-nation.html#at [↑](#footnote-ref-2)
3. http://www.youtube.com/watch?v=hgYwTELj-fs [↑](#footnote-ref-3)
4. We take Florida, Mellander, and Stolarick’s (2009) point that wages may for some purposes be a better measure of economic performance than incomes, but were unable to include wages in the present analysis. [↑](#footnote-ref-4)
5. This is not to suggest that science is not constrained by “external” factors, or that scientific results might be enhanced through transparency and channeled to the public good through democratic constraints (see Guston 2004). It is only to point out that scientific questions, by their very nature, are not decided by majority rule. What they are decided by is, of course, a matter of endless dispute. [↑](#footnote-ref-5)
6. <http://www.urbanophile.com/2010/01/29/midwest-miscellany-26/> . [↑](#footnote-ref-6)