The Value of Openness*

Joshua Della Vedova†, Stephan Siegel‡, and Mitch Warachka§

January 2023

Abstract

We provide a culture-based explanation for the role of geography in value creation by firms. As cities differ in their openness toward adopting new innovative products, local firms consequently differ in their ability to capitalize on their growth opportunities. Our proxy for openness is constructed from the likelihood that new music is first played by local radio stations. Openness exhibits persistent cross-sectional variation across U.S. cities that can be traced back more than a century ago. During our 2000 to 2019 sample period, this variation explains city-level variation in the success of new ventures and new product introductions. Openness is also positively (negatively) associated with the industry-adjusted proportion of growth (value) firms located in a city, with its impact on Tobin's q being especially strong for young firms. Our results are robust to controls for industry, demographics (such as education, income, and age), R&D expenditures, and weather.

Keywords: Value Creation, Culture, Openness, First-Mover Advantage

*We thank Tom Chang, Mike Hertzel, Gerald Hoberg, Chris Parsons, Denis Sosyura, participants at the 2022 ASREC conference in London England as well as brown bag participants at the University of Sydney, University of Washington, and Chapman University for their helpful comments and suggestions.

†University of San Diego, 5998 Alcala Park, San Diego, CA, 92110. Email: jdellavedova@sandiego.edu

‡Michael G. Foster School of Business, University of Washington, 4295 E. Stevens Way NE, Seattle, WA 98195. Email: ss1110@uw.edu

§Argyros School of Business and Economics, Chapman University, 1 University Dr., Orange, CA, 92866. Email: warachka@chapman.edu

1 Introduction

Florida, Adler, and Mellander (2017) conclude that innovation is best understood at the level of individual cities. Within the United States, cities vary across many dimensions. This paper explores one important dimension and its implications for corporate value creation. Specifically, we propose a novel proxy for a cultural trait, openness, that varies across Metropolitan Statistical Areas (MSAs). We then document the positive impact of openness on value creation by firms.

Our proxy for openness is constructed from the adoption of new music and varies with observable quantities such as income. We document persistent variation in openness across MSAs during our 2000 to 2019 sample period.[1] Consistent with the persistence of culture, high openness can be traced back to residents having more diverse birthplaces and by native-born white residents giving their children unconventional first names more than a century before the start of our sample period.

Our paper addresses two central questions: how to identify cultural variation across MSAs in the United States and how culture impacts value creation by firms. While openness is an important personality trait (Digman 1990), cultural traits are shared within a geographical area.[2] Our openness proxy focuses on the adoption of new music but is intended to capture openness more generally toward new products as well as new ideas, new processes, the acquisition of new skills, etc. Consequently, openness can not only increase the adoption of new innovative products but can also increase labor productivity. However, as labor productivity is an established determinant of value creation, our study emphasizes the complementary but novel role that openness has on the adoption of new innovative products.[3] This em-

[1] Culture has been shown to vary regionally within the United States (Rentfrow, Gosling, Jokela, Stillwell, Kosinski, and Potter 2013), while Lee (2017) documents cultural variation within England and Wales.

[2] For example, culture can determine status within groups. Provided openness confers status, individuals who are the first to listen to new music, read new books, try new restaurants, etc are likely to be in MSAs with higher openness where this cultural trait is beneficial.

[3] Our study's focus is on new innovative products, not minor refinements of existing products.

phasis is consistent with culture not being limited to a subset of highly-skilled employees. Similarly, culture is not limited to a subset of highly-skilled investors or venture capitalists. Indeed, labor and financial capital are both more mobile than culture, which complicates their ability to explain the persistent role of geography in value creation.

Our proxy for openness is constructed from radio station playlists. These playlists are not influenced by the availability of new music but instead capture variation in the propensity of radio stations to play new music. Radio station programmers determine the playlists of individual radio stations. According to Rossman (2015), success for a radio programmer is determined by their ability to understand a station's audience, not assess song quality. Thus, radio station playlists conform to audience preferences. Our study is based on 44 MSAs that contain the headquarters of at least five public firms and at least three radio stations throughout our 2000 to 2019 sample period. The number of radio stations increased from 344 in 2000 to 547 in 2019 for an average of 458 radio stations per year (over 10 per MSA). As the total number of songs played each year is independent of a radio station's audience and more generally its surrounding population, our proxy for openness is not biased upward for more populous MSAs.[4]

The positive association we hypothesize between openness and value creation requires growth through new innovative products. This requirement leads our empirical analyses to focus on new ventures (funded by venture capital), growth firms, young firms, and mature firms that introduce new products. Indeed, for firms producing new innovative products, locating in a MSA with high openness can facilitate more rapid learning from early adopters about their product markets, and is therefore especially important for new ventures and young firms. R&D expenditures and patent approvals are also examined and used as controls. The ability of openness to positively impact value creation is magnified by first-mover

[4] In contrast to consumption involving new restaurants, new books, or other physical products, the availability of new music has no MSA-level supply constraints. Moreover, there are no delivery or performance risks associated with new music that would otherwise enable variation in trust to confound our results.

advantage (Glazer 1985) that has firms rapidly achieving scale to mitigate competition.[5] Dougal, Parsons, and Titman (2021) also conclude that imperfect competition allows geography to influence value creation.[6] Lieberman and Montgomery (1988) quantify first-mover advantage using abnormally high economic rents that arise from learning-by-doing (Arrow 1962), economies of scale (Spence 1979, Spence 1981), and network externalities (Katz and Shapiro 1985, Katz and Shapiro 1986).

To clarify, openness alone cannot fully explain the ability of firms to rapidly achieve scale since scale is also dependent on population. Therefore, to isolate the marginal impact of openness, we control for the log of each MSA's population in our empirical tests along with other demographic characteristics. Other annual MSA-level control variables include population density, log per-capita income, the percentage of residents with a post-secondary education and their average age as well as cultural diversity. Besides these demographic controls, we also include the number of radio stations, weather, the industrial diversification of local firms and their average R&D expenditures. Weather is represented by the average number of days per year with temperatures between 55 and 75 degrees Fahrenheit during our sample period (Dougal, Parsons, and Titman 2021). Average R&D expenditures normalize R&D expenditures by total assets for all local firms that report non-zero R&D expenditures.

Our initial empirical tests are conducted at the MSA level. Our first MSA-level analysis examines the number of new ventures funded by venture capital as well as their likelihoods of success (acquisition or initial public offering) and failure. The results indicate that MSAs with higher openness have more new ventures and that new ventures have a higher likelihood of success. Moreover, consistent with greater competition, we also find a higher likelihood of failure for new ventures in high-openness MSAs.

Our second MSA-level analysis examines the proportion of growth and value firms within

[5] The positive impact of openness on value creation is not limited to consumer products since innovation in consumer products may require innovation in intermediate goods.

[6] Our study does not explain geography's role in value creation using specific geographic characteristics such as terrain or weather.

the same industry. Growth (value) firms are classified as those in the top (bottom) market-to-book tercile within an industry. The number of within-industry growth (value) firms is then aggregated across industries and normalized by the total number of firms in the respective MSA. The results from this analysis indicate that MSAs with higher openness have a larger (smaller) industry-adjusted proportion of growth (value) firms. The negative impact of openness on the proportion of value firms is consistent with greater competition in high-openness MSAs. For example, competition can increase the price of locally priced inputs such as rent and labor.

Our third MSA-level analysis examines aggregate Tobin's q computed by value-weighting and equal-weighting the Tobin's q of local firms. These results indicate a strong positive association between openness and aggregate Tobin's q, after controlling for variation in the industrial composition of MSAs. Moreover, the positive impact of openness on aggregate Tobin's q is robust to removing the five MSAs with the highest education levels, highest incomes, and highest populations during our sample period. Consequently, empirical support for our testable hypothesis is not attributable to a subset of outlier MSAs.

Unlike weather or other exogenous sources of variation, education is endogenous since high value creation by firms could attract more educated labor. However, the endogeneity critique is less applicable to openness since this persistent cultural characteristic is representative of the broader population rather than a subset of educated employees. Nevertheless, to address reverse causality, we instrument openness using birthplace diversity in 1890 (Manson et al., 2019) and infrequent first names in 1910 (Ruggles et al., 2019). Birthplace diversity is based on a Herfindahl index constructed from the different countries in which residents were born. In contrast, infrequent first names refers to white U.S.-born parents whose children have first names that are not among the 10 most popular names. Thus, infrequent first names represents the openness of native-born parents from the largest ethnicity to adopting relatively unconventional first names for their children. The results from the instrumental variables procedure confirm the persistence of openness and its positive impact on value creation. An additional empirical test confirms that openness in a MSA at the end of our sample is not predicted by the MSA's aggregate Tobin's q at the start of our sample. Intuitively, value creation by local firms does not alter a MSA's culture.

In addition to measuring value creation at the MSA level, we estimate a panel regression of firm-level Tobin's q on MSA-level openness. This analysis provides more observations and includes industry by year fixed effects to control for variation in firm-level value creation across industries in both the cross-section and over time. The resulting positive association between openness and firm-level Tobin's q indicates that firms located in MSAs with greater openness create more value. This positive association is robust to MSA-level controls for education, age, income, population, population density, cultural diversity, industrial diversification, number of radio stations, weather, and R&D expenditures.

To clarify, Tobin's q enables us to study cross-sectional differences in value creation captured by market valuations attributable to long-term cash flow expectations, hence growth.[7] Consistent with openness being a persistent cultural trait, lagged values of openness continue to exert a positive impact on Tobin's q. Conversely, annual changes in openness cannot explain annual changes in Tobin's q since short-term variation in the measurement of culture is immaterial.

Within the cross-section of firms, the positive impact of openness on Tobin's q is concentrated in young firms. This finding is consistent with young firms being more likely to introduce new products and depend on local early adopters to achieve scale. This heterogeneity based on firm age mitigates concerns that an omitted MSA-level variable is responsible for the positive association between openness and Tobin's q. Specifically, any omitted MSA-level variable that affects Tobin's q and is correlated with openness would also be required to vary by firm age.

[7] Dougal, Parsons, and Titman (2021) report that high value creation is due to expected rather than realized cash flow. Over the long term, market valuations reflect cash flow rather than discount rate expectations (Chen, Da, and Zhao 2013).

We also examine the association between value creation and openness for firms whose cash flows are less dependent on innovation. While the Tobin's q of firms in the majority of industries exhibits a positive association with openness, firms in industries such as energy do not benefit from openness.[8]

We examine the new product introductions in Mukherjee, Thornquist, and Zaldokas (2022) to confirm that openness facilitates the adoption of new innovative products.[9] Results indicate that greater openness is associated with more new product introductions and higher abnormal returns from these introductions. Indeed, consistent with our focus on new products that are innovative (disruptive) rather than refinements of existing products, openness has a positive association with the number of new product introductions as well as the abnormal returns corresponding to these introductions. These findings are not concentrated in young firms but apply to older firms as well, highlighting the general importance of openness to firms with growth opportunities involving new products.[10] As education does not impact new product introductions, labor productivity that is distinct from openness does not appear to influence the adoption of new products.

Two additional tests assess whether specific music genres (Pop, Rock, Alternative Contemporary, Urban, Country, and Oldies) are responsible for the positive association between openness and value creation. First, we create openness measures for individual radio stations relative to other radio stations in the same genre. These station-level measures are then aggregated according to the radio stations in each MSA to produce genre-adjusted openness

[8]By predicting negative consequences for firms whose old products are displaced by new products from other firms, creative destruction is compatible with our testable hypothesis.

[9]Although Bloom, Hassan, Kalyani, Lerner, and Tahoun (2021) use patent data to identify firm-level innovation, Mukherjee, Thornquist, and Zaldokas (2022) find that firm-level innovation is not captured by patents, trademarks, and R&D expenditures. Kogan, Papanikolaou, Seru, and Stoffman (2017) also utilize stock market reactions to patent approvals to assess the implications of firm-level innovation, and find support for creative destruction that is consistent with the stronger impact of openness on the value created by growth firms and young firms.

[10]Although founding entrepreneurs may have a personal preference to reside in MSAs with high openness, established firms are less reliant on the personal preference of their respective founders and subject to competition that encourages optimal location decisions.

measures that continue to have a positive association with value creation. Second, we supplement our main empirical specification by including genre proportions that correspond to the number of radio stations playing a specific genre in a MSA, normalized by the total number of radio stations in the MSA. The results from including these genre proportions also confirm that value creation is not attributable to specific music genres. Instead, the propensity of radio stations to play new music, regardless of genre, explains value creation.

In summary, Guiso, Sapienza, and Zingales (2006) highlight the challenges of using culture to explain economic outcomes. Rather than studying the long-term economic implications of different regional cultures, we examine the implications of variation across MSAs in a specific cultural attribute, openness, on value creation by firms. While economic conditions can induce variation in openness as well value creation, our study focuses on their persistent relative differences across MSAs. Therefore, our study builds on Dougal, Parsons, and Titman (2021)'s conclusion that variation in Tobin's q is largely explained by variation across MSAs, even within the same industry.[11]

2 Economic Motivation

We hypothesize that firms located in MSAs with higher openness create greater value by better capitalizing on their growth opportunities involving new innovative products. By mitigating competition, first-mover advantage can enhance this value creation since the more rapid early adoption of new innovative products in high-openness MSAs enables scale to be achieved more rapidly. In particular, geographical proximity to early adopters can enable firms to learn more rapidly about the product markets of their respective innovations, and increase scale more rapidly as a consequence.

First-mover advantage has several origins, including learning-by-doing (Arrow 1962), net-

[11]Dougal, Parsons, and Titman (2021) report that geography's role in value creation is robust to different industry definitions, MSA classifications, and sample periods. In particular, geography's importance to value creation was evident before the emergence of technology firms.

work externalities (Katz and Shapiro 1985, Katz and Shapiro 1986), and economies of scale (Spence 1979, Spence 1981, Hsieh and Rossi-Hansberg 2021). While the magnitude and origin of a firm's first-mover advantage is immaterial to our study, firms whose expected cash flow are most sensitive to new product introductions are predicted to experience the greatest increase in value creation from openness.

Economic theory also motivates the control variables used in our empirical tests. Although agglomeration posits that firms in the same industry are geographically concentrated, Glaeser, Kallal, Scheinkman, and Shleifer (1992) and Quigley (1998) conclude that economic growth is also attributable to knowledge "spillovers" across industries. Besides including industry fixed effects in our empirical specifications, a separate MSA-level control for industrial diversification (concentration) is included in our empirical specifications. Specifically, within each MSA, a Herfindahl index (Diversification) is constructed annually based on the aggregate market capitalization of firms within each industry. These MSA-year observations capture industrial diversification (concentration) at the MSA level.

Interactions between individuals can also facilitate knowledge spillovers. Thus, following Ciccone and Hall (1996), population density (Density) is included to control for the likelihood of interactions among individuals. Furthermore, following Ottaviano and Peri (2006) as well as Alesina and La Ferrara (2005), cultural diversity (Diversity) is included as an additional proxy for knowledge spillovers among individuals. However, as cultural diversity can reduce investments in public goods such as education (Alesina, Baqir, and Easterly 1999), the impact of cultural diversity on value creation is ambiguous.

3 Openness

Openness is one of the Big Five personality traits (Digman 1990) along with extroversion, agreeableness, conscientiousness, and neuroticism. Unlike an individual's personality, culture is shared among the residents of a geographic area, and therefore is representative of a MSA's residents. Our study focuses on a specific cultural trait, openness, whose measurement does not rely on survey data but instead is obtained from the adoption of new music to proxy for the general adoption of new products.[12] Besides proposing a novel proxy for openness, we extend the literature studying geography's role in economics by linking value creation with culture.

Our openness proxy is constructed from radio station playlists obtained from Mediabase, a company that specializes in tracking the playlists of individual radio stations. Radio airplay remains an important arbiter of a song's popularity. This importance underlies several "payola" (pay-to-play) scandals in which record companies bribed radio stations to play a song (Rossman 2015). As in the construction of our MSA-level proxy for openness, national measures of song popularity such as the Billboard charts equal-weight the playlists of individual radio stations.

According to Rossman (2015), adults in the United States listen to the radio for an average of 15 hours per week.[13] Rossman (2015) reports that radio conglomerates do not impose centralized playlists on their affiliated radio stations since the airplay of individual songs on different radio stations managed by the same conglomerate exhibit substantial leads and lags that are incompatible with centralization.[14] Instead, the playlists of radio stations are determined by individual radio station programmers who tailor their playlists to local audiences in order to maximize advertising revenue. Overall, Rossman (2015) concludes that knowing their station's audience is more important to a radio station programmer's career than their ability to assess song quality.

After matching radio stations with Metropolitan Statistical Areas (MSAs), station playlists

[12]Determining the origin of openness is beyond the scope of our paper, which does not address whether openness originates from genetics, preferences, or a desire for status.

[13]Television reduced radio listening more than streaming services (Rossman 2015).

[14]For example, radio airplay of The Dixie Chicks collapsed following their negative comments about former President George Bush. This collapse was due to listener demographics, not centralized corporate policies. Radio airplay of Pearl Jam, which expressed similar comments about the former president but had a distinct audience, was unaffected.

enable us to construct a proxy for openness using the adoption of new music. The 44 MSAs in our sample contain at least three radio stations and the headquarters of at least five public firms in each year of our 2000 to 2019 sample period. The firms in our sample comprise nearly 90% of the total market capitalization of all public firms in COMPUSTAT during our sample period. The total number of radio stations averages 458 per year, increasing from 344 in the year 2000 to 547 in the year 2019. Firm-level data underlying the construction of Tobin's q is from standard sources, with ADDZIP in COMPUSTAT identifying the MSA in which individual firms are located.[15]

Annual radio station playlists record the 125 songs with the most plays for each individual radio station each year. For every song on a station's playlist, the number of plays in each calendar month are also recorded. Although openness is designed to capture the early adoption of new products that may become a success or failure, the truncation of radio station playlists at 125 leads our proxy to focus on successful new songs. Nevertheless, the number of plays declines exponentially with a song's playlist ranking.

A song is classified as new in the month of its release provided the song has never been previously played by any radio station. A debut song pertains to a new artist who has never had a song on any previous playlist. Our proxy for openness reflects where new songs are first played on the radio (and where new artists have their debut song first played on the radio). A binary MSA-song variable records a 1 if a new song is first played in a specific MSA and 0 otherwise. If radio stations in multiple MSAs play a new song in the first month, then these MSAs are ranked by the total number of plays in the first month and the top five MSAs are assigned a 1. A MSA-year count variable then sums the binary song-year variables across all new songs played in the same year. These count variables are normalized by the total number of songs played within each respective MSA to create our proxy for openness.[16]

[15]To clarify, our study examines the value created by firms and not market values. For example, Detroit and Cincinnati both have high aggregate market values but low value creation compared to Seattle and San Francisco.

[16]MSAs with larger populations generally have more radio stations and therefore play a larger total number

Specifically, NEW equals the proportion of new songs played in a MSA for the first time relative to the total number of songs played in the MSA.

Another proxy for openness, DEBUT, is defined by where a *new artist's* new song is played for the first time. Specifically, DEBUT equals the proportion of new songs played by a new artist in a MSA for the first time relative to the total number of songs played in the MSA.[17]

Summary statistics for both our MSA-level openness proxies NEW and DEBUT are reported in Panel A of Table 1. Both proxies for openness exhibit substantial cross-sectional variation across MSAs. As NEW and DEBUT have a positive correlation of 0.898, for brevity, the majority of our empirical results designed to explain variation in value creation are reported using NEW.

Summary statistics for the MSA-level control variables are reported in Panel B of Table 1. Several of these MSA-level control variables involve demographic data obtained from the American Community Study (ACS). Summary statistics pertain to log per-capita income and log population, with population density defined as the number of people per square mile (in thousands). Other MSA-level demographic variables include the percentage of the population with a post-secondary education and the population's average age. Stations is the number of radio stations. R&D expenditures are computed as the average R&D expenditure of firms normalized by their respective total assets across all local firms that report a non-zero R&D expenditure. All control variables are annual observations, with the exception of pleasant day and cultural diversity. Pleasant day is the average number of days per year with temperatures between 55 and 75 degrees Fahrenheit over our 20 year sample period (Dougal, Parsons, and Titman 2021), while cultural diversity is the percentage of the population that

of songs. The construction of the openness proxies accounts for the number of radio stations in each MSA by accounting for the total number of songs played in the MSA.

[17] The binary MSA-new song-new artist variable starts in 2003, thereby classifying an artist as new if none of their prior songs appeared on any radio station playlist from 2000 until at least 2003. Our results are robust to shortening or lengthening this minimum three-year interval.

is non-white in 1980 to parallel Ottaviano and Peri (2006).

Panel C of Table 1 then reports summary statistics for our measures of value creation. MSA-level measures of value creation include the number of new ventures from Crunchbase as well as their success and failure. A successful exit requires a new venture to either be acquired or have an Initial Public Offering (IPO) within 7 years of being funded. Another MSA-level value creation measure is the industry-adjusted proportion of growth firms and value firms. In addition, after winsorizing Tobin's q at the firm level (1% tails), Tobin's q is aggregated at the MSA level. This aggregation across local firms yields an equal-weighted aggregate Tobin's q and a value-weighted aggregate Tobin's q, with the latter determined by the market capitalization of firms. Panel C of Table 1 also reports firm-level summary statistics for the number of new product introductions and the number of highly-successful new product introductions. These variables are obtained from Mukherjee, Thornquist, and Zaldokas (2022), with highly-successful new product introductions being those with 3-day cumulative abnormal returns (CARs) in the top quartile of all firms. Normalizing these introductions by the number of new product introductions creates the likelihood of a highly-successful new product introduction.

Table 2 reports the determinants of NEW and DEBUT, while accounting for cross-correlations among our MSA-level control variables. In addition, music genre proportions pertaining to the music genres of individual radio stations within each MSA are included. These annual genre-specific proportions normalize the number of radio stations playing a specific genre in a MSA by the total number of radio stations in the respective MSA. For example, a genre proportion of 0.2 for Rock indicates that 20% of radio stations in the MSA are classified as being a Rock music station that year.

The results in Table 2 indicate that NEW (DEBUT) is positively related to population and income, but not education. These positive correlations may have an industry component. For example, MSAs with more technology firms may have higher incomes and greater openness. Therefore, our later empirical specifications account for MSA-level industrial diversification (concentration) and the exact industrial composition of MSAs. Furthermore, our specifications include industry fixed effects at the firm level whenever possible. Later robustness tests also remove outlier MSAs regarding population, education, and income.

While the positive coefficients for several genre proportions (i.e. Rock, Pop, Adult Contemporary) indicate that these genres are associated with greater openness, the coefficient for country music is negative. Nevertheless, a later robustness test finds that despite the heterogeneous impact of different music genres on openness, MSA-level variation in the composition of radio station genres does not explain variation in value creation.

For completeness, Appendix A reports NEW, DEBUT, and the control variables for each MSA.

4 Openness and MSA-level Value Creation

MSAs across the U.S. differ in their openness. We hypothesize that higher openness enables local firms to better capitalize on their growth opportunities, leading to greater value creation. We test this hypothesis by analyzing the impact of our proxy for MSA-level openness (NEW), based on the likelihood that new music is first played by local radio stations, on MSA-level value creation. Value creation outcomes at the MSA-level include the location of new ventures as well as their success, the industry-adjusted proportion of growth (value) firms, and Tobin's q aggregated across local firms.

4.1 New Ventures

Crunchbase data allows us to study the number of new ventures in a MSA along with the number of new ventures having a successful exit. A successful exit for a new venture is defined as either being acquired or having an initial public offering within 7 years of being funded by a venture capitalist. The number of new ventures that fail is also examined.

In addition to the number of new ventures, successful exits, and failures, we examine the likelihoods of success and failure. These likelihoods are computed by normalizing the number of new ventures that succeed and fail, respectively, by the number of new ventures. Provided openness increases the number of new ventures in a MSA, high openness is associated with greater competition that can increase the likelihood of failure.

Using the number of new ventures (NV) as the dependent variable in MSA j in year t, we estimate the following panel regression

$$\mathrm{NV}_{j,t} \;=\; \beta_1\,\mathrm{NEW}_{j,t} + \gamma\,\mathrm{X}_{j,t} + \epsilon_{j,t}\,. \tag{1}$$

Besides including year fixed effects, the X vector consists of the following MSA-level controls: the number of radio stations (Stations), average age (Age), cultural diversity (Diversity), education (Education), industrial diversification (Diversification), log per-capita income (Income), weather (Pleasant Day), log population (Population), population density (Density), and average non-zero R&D expenditures (R&D). The standard errors in equation (1) are clustered by year.

Equation (1) is then re-estimated after replacing the dependent variable separately with the number of successful exits and the number of failures. Additional re-estimations are then conducted separately for the likelihoods of a successful exit and failure.

The positive β_1 estimates for NEW in Table 3 indicate that MSAs with higher openness have a larger number of new ventures and a larger number of successful exits. Consistent with greater competition in high-openness MSAs, openness is also positively associated with a larger number of new ventures failing. Furthermore, the likelihoods of a successful exit and failure are both positively associated with openness.

4.2 Growth versus Value Firms

To examine the industry-adjusted proportions of growth and value firm, the number of growth and value firms are first computed within individual industries using the top and bottom terciles of Tobin's q as thresholds. These numbers are then aggregated across industries and normalized by the total number of firms in the MSA, respectively, to obtain the industry-adjusted proportion of growth and value firms.

Using the industry-adjusted proportion of growth firms (GF) as the dependent variable in MSA j in year t, we estimate the following panel regression

$$\mathrm{GF}_{j,t} = \beta_1 \, \mathrm{NEW}_{j,t} + \gamma \, \mathrm{X}_{j,t} + \epsilon_{j,t} \, . \tag{2}$$

As in the prior analysis, equation (2) includes year fixed effects with standard errors clustered by year.

The positive β_1 estimates for NEW in Table 4 indicate that MSAs with higher openness have a higher proportion of growth firms. This analysis provides a bridge between the results for new ventures reported previously and subsequent results for aggregate Tobin's q reported next.

The panel regression in equation (2) is then repeated with the proportion of value firms (VF) as the dependent variable. In contrast to the specification with growth firms, the β_1 estimates for NEW are negative, indicating that high-openness MSAs have a lower proportion of value firms. This negative coefficient is consistent with later results involving older firms. Overall, openness explains the industry-adjusted proportion of growth (value) firms across MSAs.

4.3 Aggregate Tobin's q

After aggregating Tobin's q across local firms, our next MSA-level analysis estimates the following panel regression

$$\mathrm{Q}_{j,t} \;=\; \beta_1\,\mathrm{NEW}_{j,t} + \gamma\,\mathrm{X}_{j,t} + \epsilon_{j,t}\,. \tag{3}$$

The dependent variable (Q) is the aggregate Tobin's q of MSA j in year t with aggregation based separately on equal-weighting and value-weighting local firms according to their market capitalization. Equation (3) includes year fixed effects and industry composition weights, with standard errors clustered by year.

To construct the industry composition weights, firms are classified according to one of 11 Global Industry Classification Standard (GICS) categories: energy, material, industrial, consumer discretionary, consumer staple, healthcare, financial, information technology, communication, utility, and real estate. The weights are constructed by counting the number of firms in each industry, then normalizing these counts by the total number of firms in the MSA to create 11 industry weights that sum to 1 each year within each MSA. Therefore, 10 of these weights are included in our regression specifications (real estate's weight is excluded).

The positive β_1 estimates for NEW in Panel A of Table 5 indicate that MSAs with higher openness are associated with greater value creation by firms. Observe that the β_1 estimates are positive with the inclusion of all control variables, regardless of whether Tobin's q is aggregated by equal-weighting or value-weighting local firms.

Observe that while income is positively associated with aggregate Tobin's q at the MSA level, population is not. Furthermore, Panel B and Panel C of Table 5 based on equal-weighted Tobin's q and value-weighted Tobin's q, respectively, continue to report positive β_1 estimates for NEW after separately removing the five MSAs with the highest average population, education, and income during our sample period. In contrast, the coefficients for income and education are not consistently positive in each MSA subset. Overall, the positive impact of openness on value creation is not driven by a subset of outlier MSAs (such as Los Angeles, New York, etc), but instead applies to a wide cross-section of MSAs.

5 Reverse Causality

Our existing empirical specifications previously estimated the *contemporaneous* annual association between openness and firm value. As openness is a persistent MSA-level characteristic, the association is primarily identified through cross-sectional variation across MSAs. Indeed, unreported results confirm that annual changes in firm-level Tobin's q are not induced by annual changes in openness. However, in addition to our hypothesis that openness increases value creation, one might be concerned that value creation increases openness, by attracting employees with high openness for example.

Two empirical tests confirm that higher openness leads to greater value creation, and not the reverse. The first test implements an instrumental variables procedure to address reverse causality. A second test further addresses reverse causality using a cross-sectional regression of openness on lagged value creation.

5.1 Instruments for Openness

To first address reverse causality, we instrument openness using two variables; birthplace diversity in 1890 (Manson et al., 2019) and infrequent first names in 1910 (Ruggles et al., 2019). Birthplace diversity (BD) is based on a Herfindahl index constructed from the different countries in which a county's residents were born. In contrast, infrequent first names (IN) refers to white U.S.-born parents whose children have first names that are not among the 10 most popular first names. Thus, infrequent first names represents the openness of native-born parents from the largest ethnicity to adopting relatively unconventional first names for their children. Both these instruments involve census observations a century before the start of our sample period.

The first and second stages of our instrumental variables procedure are described by the following specifications:

$$\text{NEW}_{j,t} \;=\; \beta_1\,\text{BD}_j + \beta_2\,IN_j + \gamma\,\text{X}_{j,t} + \epsilon_{j,t}\,, \tag{4}$$

and

$$\text{Q}_{j,t} \;=\; \beta_1\,\widehat{\text{NEW}}_{j,t} + \gamma\,\text{X}_{j,t} + \epsilon_{j,t}\,. \tag{5}$$

Thus, the first stage creates MSA-level predicted openness measures, $\widehat{\text{NEW}}$, conditioned on birthplace diversity and infrequent first names as well as our prior MSA-level controls. In particular, we estimate the first stage in equation (4) with each instrument individually as well as jointly. The second stage then analyzes the MSA-level association between each of the three predicted NEW variables and equal-weighted aggregate Tobin's q.

With regards to the exclusion restriction, the above analysis assumes that birthplace diversity and infrequent first names do not directly impact value creation a century later. At a minimum, this assumption can be justified by the time interval between the instruments and our later sample period. Moreover, it is difficult to think of any economic channel whereby infrequent first names would influence value creation nearly a century later.

Table 6 contains the results from the instrumental variables procedure. The F-statistics from the first stage, all of which are above 20, indicate that our instrumental variables procedure does not suffer from a weak instrument problem. Moreover, the results in Table 6 confirm that openness is a highly persistent MSA-level characteristic that positively impacts value creation. In particular, the positive β_1 estimates for each of the three predicted NEW variables in equation (5) confirm that openness positively impacts value creation, and not the reverse.

5.2 Lead Openness and Lagged Value Creation

To further assess whether reverse causality is confounding our empirical results, we examine whether a MSA's openness later in our sample period (lead openness) is predicted by the MSA's aggregate Tobin's q early in our sample period (lagged value creation).[18] Thus, the following cross-sectional regression is estimated to test whether higher value creation leads to greater openness:

$$\mathrm{NEW}_{j,T} \;=\; \beta_1\,\mathrm{Q}_{j,0} + \gamma\,\mathrm{X}_{j,0} + \epsilon_{j,T}\,. \tag{6}$$

The independent variable Q is the time-series average of the equal-weighted aggregate Tobin's q in MSA j between 2000 to 2004, denoted period 0, while the dependent variable is the time-series average of NEW in MSA j between 2015 and 2019, denoted period T. The control variables in the above specification are time-series averages of annual MSA-level observations in period 0.

Panel A of Table 7 reports the results from the cross-sectional regression in equation (6). While the small number of observations limits our ability to detect significant predictors of NEW, the β_1 estimate for value creation at the beginning of our sample period is not only statistically insignificant but also small in magnitude. This finding does not support the alternative hypothesis that openness arises from value creation. Specifically, this result provides assurance that the positive β_1 estimates for NEW reported in the previous section are not attributable to reverse causality since a MSA's openness does not appear to be influenced by previous value creation in the MSA. Intuitively, value creation by firms does not appear to change a MSA's culture.

We also examine the predictive power of openness with respect to future firm-level Tobin's

[18] This cross-sectional regression at the MSA level does not require the same firms to be in a MSA during the start and end of our sample. For example, firms that are not in a MSA's aggregate Tobin's q early in the sample can be included in its aggregate Tobin's q later in the sample.

q. Specifically, we estimate the following regression:

$$Q_{i,S} \;=\; \beta_1 \, \text{NEW}_{j,F} + \beta_2 \, Q_{i,F} + \gamma \, X_{j,F} + \epsilon_{i,S} \,. \tag{7}$$

Therefore, instead of examining the contemporaneous association between NEW and Tobin's q, the time-series average of NEW between 2000 and 2009, denoted period F (first half), is the primary independent variable of interest while the dependent variable is the time-series average of firm-level Tobin's q between 2010 and 2019, denoted period S (second half). Industry fixed effects are included in this specification and pertain to the respective industry of each firm in the first half of our sample. Similarly, time-series averages are computed for the MSA-level control variables in the first half of our sample.

Without Q_F (β_2 set to 0), the positive β_1 estimates for NEW_F in Panel B of Table 7 indicate that lagged openness during the first half of our sample has a positive association with future value creation in the second half of our sample. This finding is consistent with openness being a persistent cultural trait.

Furthermore, consistent with stock prices incorporating the expected effect of openness on value creation, the addition of Q_F during the first half of our sample eliminates the significance of the β_1 estimates for NEW_F. Indeed, the positive β_2 estimates for Q_F in the full specification of equation (7), and insignificant β_1 estimates for NEW_F, suggest that investors understand the positive impact of culture on value creation by individual firms.

6 Openness and Firm-level Value Creation

This section investigates the impact of openness on firm-level Tobin's q. Firm-level observations enable us to examine whether the positive impact of openness on value creation is higher for growth firms, young firms, and firms in industries whose cash flows are more sensitive to growth opportunities. An additional robustness test confirms that our results are not driven by specific music genres.

Our analysis of firm-level value creation estimates a panel regression of firm-level Tobin's q on MSA-level openness:

$$\mathrm{Q}_{i,j,t} \quad = \quad \beta_1 \, \mathrm{NEW}_{j,t} + \gamma \, \mathrm{X}_{j,t} + \epsilon_{i,j,t} \, . \tag{8}$$

The dependent variable is firm i's Tobin's q in MSA j in year t. To account for time-varying industry-level differences in Tobin's q, all specifications include industry-year fixed effects based on the 11 Global Industry Classification Standard (GICS) categories. We also include MSA-level controls that may affect Tobin's q. In particular, the X vector consists of the following MSA-level controls: the number of radio stations (Stations), average age (Age), cultural diversity (Diversity), education (Education), industrial diversification (Diversification), log per-capita income (Income), weather (Pleasant Day), log population (Population), population density (Density), and average non-zero R&D expenditures (R&D). All standard errors are double-clustered by industry and year.

Panel A of Table 8 reports positive β_1 estimates for NEW, consistent with our hypothesis that firm-level value creation is positively associated with MSA-level openness. This positive association remains significant after including all MSA-level control variables, which reduces the magnitude of the β_1 estimates by about 35%. The β_1 estimates imply that a one-standard-deviation increase in NEW (0.05) is associated with a 0.07 to 0.11 increase in Tobin's q. As emphasized earlier, the impact of openness on Tobin's q captured by the β_1 estimates is mitigated by competition among firms. In contrast, the β_1 coefficients are not mitigated by competition when the dependent variable is the number of new ventures or the number of successful new ventures.

While population is positively correlated with NEW (Table 2), the results in Panel A of Table 8 indicate an insignificant association between population and firm-level value creation. This finding suggests that having more people does not necessarily create value (Dougal, Parsons, and Titman 2021). Instead, the finding suggests that having people who are open toward adopting new innovative products is associated with value creation. Similarly, while income is positively correlated with NEW, income has an insignificant association with firm-level value creation according to the results in Panel A of Table 8. This finding suggests that having the income to adopt new innovative products does not necessarily create value but rather openness toward adopting such products.

In related work, Dougal, Parsons, and Titman (2021) identify education and pleasant weather as important determinants of MSA-level value creation. These intuitive results suggest that firms located in more educated MSAS with better weather are able to attract productive labor. Our results support this labor productivity channel since Education as well as Pleasant Day both have positive coefficients. However, NEW exerts a distinct impact on firm value since its β_1 estimate remains positive following the inclusion of all MSA-level controls.

6.1 Firm Heterogeneity by Age

While we find a significantly positive association between firm-level Tobin's q and openness in our sample of all firms, firms whose valuations are more dependent on growth opportunities involving new innovative products are predicted to benefit more from openness. Conversely, firms whose valuations are more dependent on cost control than growth are predicted to benefit less from openness. Instead, these firms may be adversely affected by openness if labor, rent, and other inputs priced locally are more expensive due to competition from innovative firms. To explore firm-level heterogeneity in the association between NEW and Tobin's q, we examine variation by firm age.

Variation by firm age is motivated by young firms being more likely to release new products and rely on nearby customers than old firms. We define a firm's age by the number of years since its data was first reported in COMPUSTAT. We classify firms, specifically firm-year age observations, as young if age is less than or equal to 10 years, middle-aged if age is between 10 and 30, and old if age is 30 years or more. With these thresholds, about one third of our observations fall into each age group.

Our first analysis of firm age estimates the panel regression in equation (8) separately for young, middle-aged, and old firms. Panel A of Table 8 reports that the positive association between firm value and openness in limited to young firms as the association is insignificant for middle-aged and old firms. This heterogeneity is consistent with growth opportunities involving new innovative products being concentrated in young firms.

We then construct interaction variables as the product of NEW with an indicator function for young firms or an indicator function for old firms when estimating the following panel regression

$$\begin{aligned} \mathrm{Q}_{i,j,t} &= \beta_1 \, \mathrm{NEW}_{j,t} + \beta_2 \, 1_{\mathrm{Young}_{i,j,t}} + \beta_3 \left[\mathrm{NEW}_{j,t} \times 1_{\mathrm{Young}_{i,j,t}} \right] \\ &+ \beta_4 \, 1_{\mathrm{Old}_{i,j,t}} + \beta_5 \left[\mathrm{NEW}_{j,t} \times 1_{\mathrm{Old}_{i,j,t}} \right] + \gamma \, \mathrm{X}_{j,t} + \epsilon_{i,j,t} \, , \end{aligned} \tag{9}$$

where Q represents firm i's Tobin's q in MSA j in year t, 1_{Young} equals 1 when the age of firm i is less than or equal to 10 years in year t, and 1_{Old} equals 1 when the age of firm i is equal to 30 years or more in year t. Equation (9) includes year by industry fixed effects with standard errors double-clustered by industry and year.

The positive β_3 estimates in Panel A of Table 8 for the interaction variable involving young firms confirms that openness is significantly (at the 10%-level) more important for value creation by young firms compared to other firms. Furthermore, the insignificant β_2 estimates indicate that value creation is not necessarily higher for young firms, only for those located in MSAs with high openness.

Conversely, the negative β_4 estimates indicate that old firms have a significantly lower Tobin's q. Moreover, openness does not improve the value creation of old firms, and may even harm value creation as the β_5 estimates are negative albeit insignificant.

The heterogeneity in the association between openness and firm-level value creation mitigates concerns about omitted MSA-level variables that affect value creation and are also correlated with openness. Specifically, any such variable would be required to have its association with firm-level value creation also vary by firm age.

6.2 Instruments for Openness

We replicate our earlier instrumental variables procedure with firm-level Tobin's q in the second stage. Specifically, the first stage of this procedure, described in equation (4), is the basis for the second stage below:

$$\mathrm{Q}_{i,t} \;=\; \beta_1\, \widehat{\mathrm{NEW}}_{j,t} + \gamma\, \mathrm{X}_{j,t} + \epsilon_{i,t}\,. \tag{10}$$

This specification includes year by industry fixed effects.

The results in Panel B of Table 8 confirm that reverse causality is not responsible for the positive association between openness and value creation. Instead, the positive β_1 estimates from equation (10) for each of the three predicted NEW variables ensure that openness positively impacts value creation by firms, and not the reverse.

6.3 Variation by Industry

Although variation at the firm level regarding the importance of innovation exists within industries, the importance of innovation can also vary across industries. For example, innovation is likely to be important in the information technology industry. We therefore estimate the association between firm value and openness separately within each of the 11 industries.

Panel C of Table 8 reports that openness exerts a large positive impact on value creation in industries such as information technology and healthcare, but a negative impact on energy, and an insignificant impact on industrial firms. These results build on our previous results as firms in the information technology industry tend to be younger than industrial firms for example.

Overall, over half of the industries (six of eleven) display a positive association between firm value and openness compared to one negative association. Thus, the importance of culture to value creation is not an isolated result.

6.4 Music Genres

As the intensity of new songs (artists) can vary by music genre, NEW may capture MSA-level variation in the composition of radio stations by genre in addition to openness. Preferences for certain genres could be correlated with additional value-relevant characteristics, such as age or education. Therefore, we implement two additional robustness tests to account for genre differences in the composition of radio stations across MSAs. Radio stations in our sample are classified according to one of six genres; Pop, Rock, Alternative Contemporary, Urban, Country, and Oldies.

The first robustness test creates a genre-adjusted proxy for openness at the MSA level. This proxy begins by constructing genre-specific station-level openness measures, then normalizes these measures to have a mean of zero and standard deviation of 1 across all radio stations within the same genre in the same year. We then aggregate the six standardized, genre-specific, station-level openness measures across the radio stations in each MSA every year to obtain genre-adjusted openness measures that replace NEW in equation (8).

The second robustness test supplements equation (8) with annual genre-specific proportions that equal the proportion of radio stations playing a specific genre in an MSA relative to the total number of radio stations in the MSA. For example, as in Table 2, if 20% of the radio stations in a MSA are associated with the Rock genre that year, the MSA-year genre proportion equals 0.2.

The results in Panel A of Table 9 indicates that the genre-adjusted openness measures continue to have a positive association with firm value. Thus, the positive association between openness and value creation is not driven by MSA-level variation in the composition of radio stations by genre.

In Panel B of Table 9, our results control for genre proportions representing the composition of radio stations in a MSA. The positive β_1 estimates reveal that only a small portion of openness's impact on value creation can be attributed to MSA-level variation in the composition of radio stations by genre. In particular, even after controlling for variation in the composition of radio stations by genre, the β_1 estimates for NEW remain positive and relatively large.

7 Openness and New Product Introductions

This section provides evidence supporting our hypothesis that openness' positive impact on value creation is due to growth opportunities involving new products. The initial success of a new product introduction is especially important to firms with a salient first-mover advantage. Thus, we examine the empirical association between MSA-level openness and firm-level new product introductions.

Mukherjee, Thornquist, and Zaldokas (2022) provide annual data on the cumulative abnormal returns following new product introductions by firms. Overlap between our samples allows for an analysis of new product introductions between 2001 and 2006. We examine three firm-level outcomes in this analysis: the number of new product introductions per firm-year, the number of highly-successful new product introductions whose resulting cumulative abnormal return (CAR) in the subsequent three days is in the top quartile, and the likelihood of highly-successful new product introductions relative to all introductions.

Provided openness enables firms to capitalize on their growth opportunities involving new innovative products, openness is predicted to be positively associated with the number of new product introductions as well as the number of highly-successful new product introductions. However, the impact of openness on the likelihood of highly-successful new product introductions is ambiguous since firms in high-openness MSAs may introduce more new products, including less successful products that lower the likelihood of highly-successful product introductions.

The positive β_1 estimates for NEW in Panel A of Table 10 indicate that openness is positively associated with the number of new product introductions. In addition, both the number and likelihood of highly-successful introductions are positively associated with openness. Overall, greater openness appears to increase value creation through growth involving the introduction of new products.

In Panel B of Table 10, we repeat the analysis after removing young firms whose age is less than or equal to ten years. These results indicate that the benefits of openness apply to older established firms that introduce new products. Thus, openness is not only beneficial for young firms but also for older firms that release new products. Overall, growth opportunities involving new products are a likely channel through which openness positively impacts value creation.

The results in both panels of Table 10 indicate that education does not influence new product introductions. Thus, the adoption of new products (assuming firms release new products where they are most likely to be adopted) does not appear to be related to labor productivity. Consequently, while openness is positively associated with new product introductions and education, hence labor productivity, labor productivity and new product adoption are distinct channels through which openness increases value creation.

8 Conclusions

We provide an explanation for the important role of geography in value creation based on a cultural trait, openness. Specifically, we study openness toward the adoption of new innovative products. First-mover advantage provides an economic foundation for our testable hypothesis that greater openness in a Metropolitan Statistical Area (MSA) increases value creation by local firms.

We construct a novel proxy for openness using MSA-level data from radio station playlists. This proxy is based on the adoption of new music and varies significantly across MSAs. Empirically, we find a robust positive association between openness and value creation measured by the number of new ventures, the success of new ventures, the proportion of growth firms, and Tobin's q. These positive associations are robust to controlling for an array of demographic and industry controls as well as weather and R&D expenditures. Our results are especially strong for young firms that are more likely to be dependent on growth and local customers. An instrumental variables procedure confirms that openness, as a cultural trait, is highly persistent with variation across MSAs being evident more than a century before the start of our sample period. The instrumental variable procedure also confirms that reverse causality is not responsible for the positive impact of openness on value creation.

Further evidence on new product introductions reinforces our conclusion that openness positively impacts value creation by facilitating the adoption of new products. Thus, openness increases value creation by allowing firms to capitalize on their growth opportunities.

References

Alesina, A., R. Baqir, and W. Easterly, 1999. Public goods and ethnic divisions. Quarterly Journal of Economics 114, 1243–1284.

Alesina, A., and E. La Ferrara, 2005. Ethnic diversity and economic performance. Journal of Economic Literature 43, 762-800.

Arrow, K., 1962. The economic implications of learning by doing. Review of Economic Studies 29, 155-173.

Barrios, J., Y. Hochberg, and D. Macciocchi, 2021. Rugged entrepreneurs: The geographic and cultural contours of new business formation. Working Paper.

Bloom, N., T. A. Hassan, A. Kalyani, J. Lerner, and A. Tahoun, 2021. The diffusion of disruptive technologies. Working Paper.

Chen, L., Z. Da, and X. Zhao, 2013. What drives stock price movements? Review of Financial Studies 26, 841–876.

Ciccone, A., and R. Hall, 1996. Productivity and the density of economic activity. American Economic Review 86, 54-70.

Digman, J. M., 1990. Personality structure: Emergence of the five-factor model. Annual Review of Psychology 41, 417–440.

Dougal, C., C. Parsons, and S. Titman, 2015. Urban vibrancy and corporate growth. Journal of Finance 70, 163-210.

Dougal, C., C. Parsons, and S. Titman, 2021. The geography of value creation. Forthcoming in Review of Financial Studies.

Florida, R. P. Adler and C. Mellander, 2017. The city as innovation machine. Regional Studies 51, 86-96.

Glaeser, E., H. Kallal, J. Scheinkman, and A. Shleifer, 1992. Growth in cities. Journal of Political Economy 100, 1126-1152.

Glazer, A., 1985. The advantages of being first. American Economic Review 75, 473–480.

Guiso, L., P. Sapienza, and L. Zingales, 2006. Does culture affect economic outcomes? Journal of Economic Perspectives 20, 23-48.

Hsieh, C. T., and E. Rossi-Hansberg, 2021. The industrial revolution in services. Working Paper.

Katz, M., and C. Shapiro, 1985. Network externalities, competition, and compatibility. American Economic Review 75, 424–440.

Katz, M., and C. Shapiro, 1986. Technology adoption in the presence of network externalities. Journal of Political Economy 94, 822–841.

Kogan, L., D. Papanikolaou, A. Seru, and N. Stoffman, 2017. Technological innovation, resource allocation, and growth. Quarterly Journal of Economics 132, 665-712.

Lee, N., 2017. Psychology and the geography of innovation. Economic Geography 93, 106-130.

Lieberman, M., and D. Montgomery, 1988. First-mover advantages. Strategic Management Journal 9, 41-58.

Manson, S., J. Schroeder, D. Van Riper, and S. Ruggles, 2019. IPUMS National Historical Geographic Information System: Version 14.0 [Database]., Minneapolis, MN: IPUMS.

Mukherjee, A., T. Thornquist, and A. Zaldokas, 2022. New products. Working Paper.

Ottaviano, G. and G. Peri, 2006. The economic value of cultural diversity: Evidence from US cities. Journal of Economic Geography 6, 9–44.

Rentfrow, P. J., S. D. Gosling, M. Jokela, D. J. Stillwell, M. Kosinski, and J. Potter, 2013.

Divided we stand: Three psychological regions of the United States and their political, economic, social, and health correlates. Journal of Personality and Social Psychology 105, 996-1012.

Rossman, G., 2015. Climbing the charts: What radio airplay tells us about the diffusion of innovation. Princeton University Press.

Ruggles, S., S. Flood, R. Goeken, J. Grover, E. Meyer, J. Pacas, and M. Sobek, 2019. Integrated Public Use Microdata Series: Version 9.0 [dataset], Minneapolis, MN: IPUMS.

Spence, M., 1979. Investment strategy and growth in a new market. Bell Journal of Economics 10, 1–19.

Spence, M., 1981. The learning curve and competition. Bell Journal of Economics 12, 49–70.

Quigley, J., 1998. Urban diversity and economic growth. Journal of Economic Perspectives 12, 127–138.

Appendix A

MSA	NEW	DEBUT	Stations	Age	Diversity	Educ.	Diversification	Income	Pleasant Day	Pop.	Density	R&D
Atlanta, GA	0.061	0.023	10	35.45	0.27	34.33	0.18	41.82	70	5.17	833.75	0.05
Austin, TX	0.081	0.028	9	34.09	0.12	39.74	0.14	45.68	62	1.77	413.28	0.20
Baltimore, MD	0.074	0.023	8	36.99	0.27	33.43	0.33	45.40	63	2.67	938.76	0.13
Birmingham, AL	0.035	0.01	7	37.91	0.31	26.12	0.24	38.85	50	1.08	335.03	0.17
Boston, MA	0.096	0.035	17	36.00	0.08	42.84	0.22	60.63	56	4.64	754.48	0.40
Buffalo, NY	0.052	0.018	8	39.98	0.10	27.48	0.68	38.52	73	1.14	495.52	0.88
Charlotte, NC	0.049	0.014	11	35.25	0.23	31.94	0.35	41.33	65	1.98	576.76	0.06
Chattanooga, TN	0.052	0.02	8	39.20	0.16	21.78	0.54	35.20	59	0.52	277.51	0.02
Chicago, IL	0.094	0.032	15	36.95	0.23	32.92	0.14	47.27	70	9.38	1026.79	0.08
Cincinnati, OH	0.035	0.011	10	37.95	0.15	28.33	0.58	41.79	51	2.12	548.37	0.10
Cleveland, OH	0.038	0.012	9	39.59	0.19	26.85	0.21	40.26	57	2.10	1049.34	0.09
Columbus, OH	0.058	0.022	10	35.57	0.13	32.59	0.25	40.07	55	1.86	585.71	0.04
Dallas, TX	0.062	0.021	13	34.11	0.16	30.49	0.20	43.90	71	6.32	669.16	0.11
Denver, CO	0.074	0.025	11	36.01	0.08	37.76	0.13	48.89	40	2.58	301.49	0.11
Detroit, MI	0.054	0.017	12	37.48	0.22	27.08	0.51	41.33	62	4.35	618.57	0.04
Honolulu, HI	0.069	0.026	7	38.74	0.65	31.30	0.28	46.15	64	0.95	513.65	0.00
Houston, TX	0.044	0.015	9	33.87	0.22	28.53	0.05	46.39	60	5.95	683.27	0.46
Indianapolis, IN	0.05	0.014	9	35.80	0.14	30.39	0.58	41.93	70	1.79	504.62	0.13
Jacksonville, FL	0.023	0.009	7	36.70	0.24	26.40	0.25	39.22	89	1.32	426.86	0.03
Las Vegas, NV	0.064	0.022	12	36.89	0.14	21.15	0.23	38.98	59	1.89	47.59	0.05
Los Angeles, CA	0.165	0.054	13	36.24	0.18	30.29	0.24	46.69	183	12.87	365.12	0.20
Louisville, KY	0.025	0.01	9	38.31	0.17	24.14	0.32	38.66	49	1.23	585.87	0.01
Memphis, TN	0.077	0.025	10	35.67	0.43	24.44	0.35	37.31	49	1.29	415.97	0.23
Miami, FL	0.072	0.028	17	38.41	0.21	28.36	0.32	43.73	70	5.55	1491.23	0.18
Milwaukee, WI	0.038	0.014	9	36.15	0.12	30.75	0.15	44.27	64	1.55	394.50	0.03
Minneapolis, MN	0.09	0.026	8	37.18	0.05	37.20	0.23	47.52	55	3.26	513.91	0.09
Nashville, TN	0.066	0.025	11	36.33	0.17	29.30	0.38	42.76	50	1.59	385.01	0.07
New York, NY	0.159	0.052	11	39.07	0.22	35.95	0.06	57.61	67	18.95	1464.51	0.32
Oklahoma City, OK	0.043	0.017	10	36.31	0.14	27.68	0.33	39.71	54	1.26	292.86	0.02
Omaha, NE	0.023	0.007	7	35.53	0.11	32.44	0.52	44.72	50	0.86	341.45	0.02
Orlando, FL	0.035	0.015	9	35.86	0.15	28.34	0.28	35.48	92	2.16	543.12	0.06
Philadelphia, PA	0.067	0.021	15	37.01	0.20	32.23	0.20	48.12	61	5.91	870.03	19.88

MSA	NEW	DEBUT	Stations	Age	Diversity	Educ.	Diversification	Income	Pleasant Day	Pop.	Density	R&D
Phoenix, AZ	0.074	0.03	11	36.44	0.06	27.34	0.16	36.87	78	4.08	279.55	0.21
Pittsburgh, PA	0.031	0.012	9	40.90	0.09	28.62	0.18	42.71	58	2.37	507.67	0.06
Portland, OR	0.068	0.026	10	37.23	0.06	32.46	0.31	39.82	34	2.16	306.16	0.13
Raleigh, NC	0.035	0.012	7	34.97	0.28	41.43	0.25	43.68	62	1.10	309.73	0.31
Salt Lake City, UT	0.084	0.028	14	33.19	0.04	30.04	0.28	38.04	38	1.10	532.12	0.19
San Antonio, TX	0.093	0.033	10	34.92	0.16	24.65	0.45	36.99	63	2.12	633.12	0.08
San Diego, CA	0.065	0.025	12	36.52	0.13	34.38	0.32	46.28	182	3.10	688.16	1.02
San Francisco, CA	0.119	0.045	10	40.78	0.23	44.29	0.27	70.76	129	4.45	512.39	0.30
Seattle, WA	0.126	0.054	11	37.76	0.09	37.12	0.32	52.56	70	3.46	426.74	0.35
Tampa, FL	0.046	0.017	11	37.17	0.10	26.08	0.30	38.47	82	2.78	847.36	0.04
Tulsa, OK	0.035	0.015	9	36.58	0.14	25.27	0.21	44.79	49	0.94	181.69	0.04
Washington, DC	0.065	0.022	10	37.29	0.32	46.53	0.36	55.10	48	5.46	521.93	0.09

Table 1: Panel A reports summary statistics for the openness proxies NEW and DEBUT based on annual observations from 2000 to 2019. Panel B reports summary statistics for the MSA-level control variables; number of radio stations (Stations), average age of residents (Age), cultural diversity of residents (Diversity), proportion of residents with a post-secondary education (Education), industrial diversification (Diversification), log per-capita income (Income), weather (Pleasant Day), log population (Population), population density (Density), and R&D as well as two instrumental variables; birthplace diversity in 1890 and infrequent first names in 1910. Panel C reports summary statistics for the value creation outcomes; number of new ventures, successful exits (number), successful exits (likelihood), failures (number), failures (likelihood), proportion of value firms, proportion of growth firms, aggregate Tobin's q (equal weighted), aggregate Tobin's q (value weighted), Tobin's q (firm level), new product introductions (number), highly-successful new product introductions (number), and highly-successful new product introductions (likelihood).

Panel A: Proxies for openness

	N	Mean	Std. Dev.	Min	10^{th}	50^{th}	90^{th}	Max
NEW	880	0.065	0.038	0.009	0.026	0.056	0.115	0.267
DEBUT	880	0.023	0.015	0.000	0.008	0.019	0.042	0.125

Panel B: MSA-level control variables

	N	Mean	Std. Dev.	Min	10^{th}	50^{th}	90^{th}	Max
Stations	880	10.409	2.914	3.000	7.000	10.000	14.000	21.000
Age	880	36.858	1.943	31.754	34.490	36.609	39.519	41.834
Diversity	880	0.180	0.107	0.039	0.076	0.157	0.279	0.650
Education	880	31.263	6.149	18.020	24.340	30.340	40.040	50.820
Diversification	880	0.300	0.177	0.039	0.124	0.254	0.569	0.921
Income	880	10.672	0.223	10.191	10.385	10.664	10.966	11.537
Pleasant Day	880	67.795	29.507	34.000	49.000	62.000	89.000	183.000
Population	880	14.715	0.762	13.074	13.813	14.607	15.624	16.777
Density	880	569.556	301.130	34.637	286.416	503.798	979.888	1957.704
R&D	880	0.615	2.947	0.000	0.025	0.094	0.400	19.882
Birthplace Diversity, 1890	860	0.325	0.184	0.007	0.081	0.372	0.555	0.641
Infrequent Names, 1910	860	0.684	0.048	0.598	0.631	0.686	0.758	0.784

Panel C: Value creation measures

	N	Mean	Std. Dev.	Min	10^{th}	50^{th}	90^{th}	Max
New Ventures	880	28.272	73.019	1.000	1.917	8.000	54.500	735.000
Successful Exits (number)	880	4.347	12.716	0.000	0.000	1.000	9.000	151.000
Successful Exits (likelihood)	880	0.142	0.176	0.000	0.000	0.100	0.333	1.000
Failures (number)	880	2.067	6.218	0.000	0.000	0.143	4.500	77.000
Failures (likelihood)	880	0.077	0.129	0.000	0.000	0.017	0.200	1.000
Proportion of Value Firms	880	0.331	0.132	0.000	0.167	0.323	0.500	0.865
Proportion of Growth Firms	880	0.315	0.131	0.000	0.152	0.308	0.474	0.889
Tobin's q (equal weighted)	880	1.776	0.506	0.853	1.214	1.688	2.390	4.786
Tobin's q (value weighted)	880	2.096	0.906	0.981	1.234	1.862	3.176	7.260
Tobin's q (firm level)	26,849	1.853	1.702	0.127	0.786	1.308	3.465	23.411
Product Introductions	3,450	2.706	7.836	0.000	0.000	1.000	6.000	100.000
Successful Introductions (number)	3,450	1.330	3.988	0.000	0.000	0.000	3.000	58.000
Successful Introductions (likelihood)	3,450	0.252	0.371	0.000	0.000	0.000	1.000	1.000

Table 2: This table reports the MSA-level determinants of our openness proxies, NEW and DEBUT. These determinants include the control variables used in later empirical tests and genre proportions (with the Urban proportion removed). Year fixed effects are included in this specification, with standard errors clustered by year. *p*-values are reported in parentheses, with ***, **, * indicating significance at the 1%, 5%, and 10% levels, respectively.

	NEW		DEBUT	
Stations	0.003***	0.002***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
Age	0.000	-0.001***	0.000**	-0.000
	(0.523)	(0.007)	(0.010)	(0.921)
Diversity	0.012*	0.009	0.001	-0.006
	(0.053)	(0.379)	(0.755)	(0.120)
Education	-0.000	-0.001**	-0.000	-0.000*
	(0.740)	(0.011)	(0.746)	(0.059)
Diversification	-0.002	0.006	-0.002	0.001
	(0.773)	(0.288)	(0.358)	(0.748)
Income	0.068***	0.074***	0.026***	0.027***
	(0.000)	(0.000)	(0.002)	(0.001)
Pleasant Day	0.000***	0.000	0.000***	0.000
	(0.000)	(0.282)	(0.000)	(0.194)
Population	0.017***	0.020***	0.005***	0.005***
	(0.000)	(0.000)	(0.000)	(0.000)
Density	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.002)	(0.000)
R&D	-0.001***	-0.002***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
Pop		0.046***		0.013**
		(0.001)		(0.015)
Rock		0.046**		0.012*
		(0.017)		(0.093)
Adult Contemporary		0.087***		0.026***
		(0.000)		(0.003)
Country		-0.079***		-0.037***
		(0.000)		(0.000)
Oldies		0.013		-0.011
		(0.337)		(0.100)
Observations	880	880	880	880
R-squared	0.371	0.442	0.352	0.408
Year FE	YES	YES	YES	YES

Table 3: This table reports the results from equation (1) that regresses MSA-level dependent variables involving new ventures on openness (NEW) during the 2000 to 2019 sample period. The first dependent variable is the number of new ventures, the second pair is the number and likelihood of a successful exit, and the third pair is the number and likelihood of a failure. A successful exit refers to the new venture either being acquired or having an initial public offering (IPO). Both likelihoods normalize the relevant number of successful exists or failures by the respective number of total new ventures in the MSA that year. MSA-level controls include the number of radio stations (Stations), average age (Age), cultural diversity (Diversity), education (Education), industrial diversification (Diversification), log per-capita income (Income), weather (Pleasant Day), log population (Population), population density (Density), and average non-zero R&D expenditures scaled by total assets (R&D). Standard errors are clustered by year. *p*-values are reported in parentheses, with ***, **, * indicating significance at the 1%, 5%, and 10% levels, respectively.

	New Ventures		Successful Exits				Failures			
	Number		Number		Likelihood		Number		Likelihood	
NEW	756.175***	379.497***	115.283***	56.494***	0.404***	0.405***	48.761***	21.710***	-0.049	0.244**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.006)	(0.005)	(0.000)	(0.000)	(0.586)	(0.036)
Stations		-2.345**		-0.188		0.000		-0.036		-0.001
		(0.043)		(0.270)		(0.958)		(0.631)		(0.511)
Age		7.940***		1.614***		-0.002		0.859***		0.001
		(0.000)		(0.000)		(0.603)		(0.000)		(0.688)
Diversity		-5.877		0.384		-0.128***		2.304*		0.108*
		(0.669)		(0.874)		(0.008)		(0.063)		(0.093)
Education		2.214***		0.688***		0.007***		0.286***		-0.002*
		(0.000)		(0.000)		(0.000)		(0.000)		(0.087)
Diversification		-32.280***		-4.640**		-0.027		-1.717		0.034
		(0.004)		(0.035)		(0.399)		(0.120)		(0.333)
Income		44.942***		-7.945***		-0.365***		-3.509***		0.001
		(0.007)		(0.002)		(0.000)		(0.005)		(0.978)
Pleasant Day		0.469***		0.077***		-0.000		0.047***		0.000
		(0.000)		(0.001)		(0.739)		(0.000)		(0.651)
Population		14.899***		2.565***		0.016*		1.129***		-0.010
		(0.000)		(0.000)		(0.083)		(0.000)		(0.179)
Density		-0.009		-0.003		-0.000		-0.002***		-0.000**
		(0.344)		(0.126)		(0.286)		(0.005)		(0.029)
R&D		-0.613*		-0.095		0.002		-0.026		0.001
		(0.055)		(0.104)		(0.170)		(0.422)		(0.349)
Observations	880	880	880	880	880	880	880	880	880	880
R-squared	0.160	0.395	0.123	0.294	0.008	0.130	0.092	0.266	0.000	0.044

Table 4: This table reports the results from equation (2) that regresses the industry-adjusted proportion of growth (value) firms in a MSA on openness (NEW). The number of growth and value firms are computed within individual industries using the top and bottom terciles of Tobin's q as thresholds. These numbers are then aggregated across industries and normalized by the total number of firms in the MSA, respectively, to obtain the industry-adjusted proportion of growth and value firms. Year fixed effects and MSA-level industry composition weights are included in the regression. The industry composition weights are based on 11 Global Industry Classification Standard (GICS) categories with the weight for real estate excluded. Standard errors are clustered by year. *p*-values are reported in parentheses, with ***, **, * indicating significance at the 1%, 5%, and 10% levels, respectively.

	Proportion of Growth		Proportion of Value	
NEW	0.410***	0.293***	-0.244***	-0.245**
	(0.000)	(0.007)	(0.000)	(0.032)
Stations		-0.004**		0.002
		(0.029)		(0.198)
Age		-0.011***		0.011***
		(0.009)		(0.003)
Diversity		-0.138*		-0.062
		(0.052)		(0.342)
Education		0.003*		-0.003***
		(0.077)		(0.004)
Diversification		-0.059*		0.053
		(0.060)		(0.120)
Income		0.201**		-0.165***
		(0.015)		(0.007)
Pleasant Day		0.000		-0.001***
		(0.339)		(0.001)
Population		-0.014		0.021*
		(0.244)		(0.065)
Density		-0.000		0.000
		(0.288)		(0.866)
R&D		0.011***		0.015***
		(0.000)		(0.000)
Observations	880	880	880	880
R-squared	0.001	0.208	0.004	0.224
Industry Composition	NO	YES	NO	YES
Year FE	YES	YES	YES	YES

Table 5: Panel A of this table reports the results from equation (3) that regresses aggregate MSA-level Tobin's q on openness. Aggregate Tobin's q is computed separately for local firms using equal-weights and value-weights based on market capitalization. Year fixed effects and MSA-level industry composition weights are included in the last specification. The industry composition weights are based on 11 Global Industry Classification Standard (GICS) categories with the weight for real estate excluded. Standard errors are clustered by year. Panel B and Panel C report the results for equal-weighted aggregate Tobin's q and value-weighted Tobin's q, respectively, after removing the 5 MSAs with the largest population, highest education, and highest income. *p*-values are reported in parentheses, with ***, **, * indicating significance at the 1%, 5%, and 10% levels, respectively.

Panel A: All MSAs

	Value-weighted Tobin's q				Equal-weighted Tobin's q			
NEW	4.302***	4.031***	1.698**	4.294***	3.552***	3.603***	2.303***	2.763***
	(0.000)	(0.000)	(0.014)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Stations			0.004	-0.029**			0.004	-0.011**
			(0.764)	(0.014)			(0.543)	(0.042)
Age			-0.058***	-0.075***			-0.037***	-0.040***
			(0.007)	(0.000)			(0.000)	(0.000)
Diversity			-1.579***	-1.220***			-1.143***	-0.027
			(0.000)	(0.000)			(0.000)	(0.864)
Education			0.031***	-0.001			0.026***	0.011**
			(0.000)	(0.816)			(0.000)	(0.021)
Diversification			-0.080	-0.029			-0.205**	-0.045
			(0.675)	(0.862)			(0.025)	(0.643)
Income			0.844**	1.960***			0.367**	0.419**
			(0.020)	(0.000)			(0.014)	(0.028)
Pleasant Day			0.005***	0.002***			0.004***	0.002***
			(0.000)	(0.004)			(0.000)	(0.002)
Population			-0.220***	-0.325***			-0.221***	-0.082***
			(0.001)	(0.000)			(0.000)	(0.001)
Density			0.000**	0.000**			0.000***	0.000
			(0.029)	(0.010)			(0.000)	(0.248)
R&D			-0.015***	0.001			0.000	0.003
			(0.002)	(0.870)			(0.925)	(0.166)
Observations	880	880	880	880	880	880	880	880
R-squared	0.032	0.060	0.171	0.410	0.070	0.148	0.350	0.566
Industry Composition	NO	NO	NO	YES	NO	NO	NO	YES
Year FE	NO	YES	YES	YES	NO	YES	YES	YES

Panel B: Equal-weighted Tobin's q with top 5 MSAs excluded

	Equal-weighted Tobin's q								
	Exclude largest population			Exclude highest education			Exclude highest income		
NEW	6.033***	3.836***	3.785***	3.521***	2.784***	3.422***	2.547***	1.615**	2.297***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.011)	(0.001)
Stations		-0.001	-0.016*		0.010	-0.015**		0.005	-0.014*
		(0.869)	(0.059)		(0.172)	(0.015)		(0.488)	(0.065)
Age		-0.045***	-0.044***		-0.037***	-0.050***		-0.048***	-0.060***
		(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)
Diversity		-0.989***	-0.003		-1.347***	-0.004		-1.148***	0.035
		(0.000)	(0.986)		(0.000)	(0.981)		(0.000)	(0.834)
Education		0.017***	0.009*		0.019***	-0.001		0.022***	0.001
		(0.004)	(0.100)		(0.002)	(0.879)		(0.000)	(0.887)
Diversification		-0.219**	-0.110		-0.220**	-0.104		-0.323***	-0.109
		(0.020)	(0.283)		(0.023)	(0.291)		(0.001)	(0.291)
Income		0.389**	0.297		0.609***	0.569***		0.155	0.218
		(0.018)	(0.127)		(0.000)	(0.003)		(0.382)	(0.179)
Pleasant Day		0.006***	0.003***		0.005***	0.002***		0.005***	0.003***
		(0.000)	(0.000)		(0.000)	(0.001)		(0.000)	(0.000)
Population		-0.102***	0.008		-0.259***	-0.122***		-0.250***	-0.125***
		(0.006)	(0.850)		(0.000)	(0.000)		(0.000)	(0.000)
Density		0.000**	-0.000		0.000***	0.000**		0.000***	0.000**
		(0.011)	(0.486)		(0.000)	(0.032)		(0.000)	(0.014)
R&D		-0.004	0.002		-0.001	0.008**		0.002	0.009***
		(0.157)	(0.382)		(0.670)	(0.013)		(0.388)	(0.005)
Observations	780	780	780	780	780	780	780	780	780
R-squared	0.196	0.396	0.583	0.139	0.326	0.568	0.089	0.319	0.544
Industry Composition	NO	NO	YES	NO	NO	YES	NO	NO	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES

Panel B: Value-weighted Tobin's q with top 5 MSAs excluded

	Value-weighted Tobin's q								
	Exclude largest population			Exclude highest education			Exclude highest income		
NEW	7.645***	3.822***	5.926***	3.693***	0.813	4.384***	0.752	-1.778	1.749*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.289)	(0.000)	(0.546)	(0.155)	(0.056)
Stations		-0.009	-0.026*		0.023*	-0.043***		0.020	-0.031**
		(0.605)	(0.056)		(0.073)	(0.002)		(0.174)	(0.012)
Age		-0.091***	-0.074***		-0.031**	-0.066***		-0.071***	-0.076***
		(0.002)	(0.000)		(0.039)	(0.000)		(0.000)	(0.000)
Diversity		-1.310***	-1.228***		-1.434***	-0.680***		-1.039***	-0.598***
		(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)
Education		0.008	-0.001		0.034***	0.031***		0.035***	-0.001
		(0.275)	(0.925)		(0.000)	(0.004)		(0.000)	(0.907)
Diversification		-0.076	-0.065		0.109	-0.004		-0.120	-0.109
		(0.690)	(0.708)		(0.578)	(0.985)		(0.571)	(0.612)
Income		1.085***	1.816***		1.562***	1.436***		0.303	0.841**
		(0.002)	(0.000)		(0.001)	(0.000)		(0.481)	(0.031)
Pleasant Day		0.008***	0.005***		0.005***	0.002**		0.006***	0.003**
		(0.000)	(0.000)		(0.000)	(0.010)		(0.000)	(0.013)
Population		0.024	-0.338***		-0.204***	-0.340***		-0.214***	-0.207***
		(0.787)	(0.008)		(0.001)	(0.000)		(0.000)	(0.005)
Density		-0.000	0.000		0.000	0.000**		0.000***	0.000***
		(0.812)	(0.133)		(0.235)	(0.026)		(0.007)	(0.001)
R&D		-0.020***	0.001		-0.024***	0.001		-0.017***	0.002
		(0.000)	(0.739)		(0.000)	(0.898)		(0.001)	(0.700)
Observations	780	780	780	780	780	780	780	780	780
R-squared	0.091	0.215	0.415	0.047	0.155	0.409	0.027	0.149	0.379
Industry Composition	NO	NO	YES	NO	NO	YES	NO	NO	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table 6: This table reports the results from our instrumental variables procedure whose first stage is in equation (4) and whose second stage is in equation (5). The first stage creates three predicted NEW variables by conditioning on birthplace diversity in 1890 and infrequent first names in 1910, separately and jointly, as well as MSA-level controls. The second stage then regresses aggregate (equal-weighted) Tobin's q during our 2000 to 2019 sample period on each of these three predicted NEW variables. Year fixed effects and the industry composition weights are included in all specifications. *p*-values are reported in parentheses, with ***, **, * indicating significance at the 1%, 5%, and 10% levels, respectively.

	1^{st} Stage NEW	2^{nd} Stage Tobin's q	1^{st} Stage NEW	2^{nd} Stage Tobin's q	1^{st} Stage NEW	2^{nd} Stage Tobin's q
Predicted NEW		7.704***		5.405***		6.441***
		(0.001)		(0.004)		(0.000)
Birthplace Diversity	0.046***				0.066***	
	(0.000)				(0.000)	
Infrequent Names			0.200***		0.271***	
			(0.000)		(0.000)	
Stations	0.003***	-0.024***	0.002***	-0.018**	0.002***	-0.021***
	(0.000)	(0.005)	(0.000)	(0.020)	(0.000)	(0.002)
Age	-0.001*	-0.036***	0.001	-0.037***	0.000	-0.037***
	(0.099)	(0.000)	(0.122)	(0.000)	(0.530)	(0.000)
Diversity	-0.003	0.480**	-0.057***	0.372*	0.003	0.421**
	(0.871)	(0.027)	(0.000)	(0.064)	(0.851)	(0.029)
Education	-0.001	0.015***	-0.001***	0.013***	0.000	0.014***
	(0.106)	(0.003)	(0.006)	(0.008)	(0.919)	(0.002)
Diversification	-0.010	-0.031	0.000	-0.056	0.006	-0.044
	(0.124)	(0.728)	(0.948)	(0.504)	(0.395)	(0.594)
Income	0.054***	0.040	0.103***	0.226	0.073***	0.142
	(0.001)	(0.882)	(0.000)	(0.352)	(0.000)	(0.511)
Pleasant Day	0.000**	0.001**	0.000*	0.002***	0.000**	0.002***
	(0.017)	(0.011)	(0.061)	(0.002)	(0.010)	(0.004)
Population	0.010***	-0.158***	0.014***	-0.128***	0.010***	-0.142***
	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)	(0.000)
Density	-0.000**	0.000*	-0.000	0.000	-0.000	0.000*
	(0.011)	(0.067)	(0.152)	(0.128)	(0.257)	(0.079)
R&D	-0.002***	0.013**	-0.001***	0.009*	-0.001***	0.011**
	(0.000)	(0.030)	(0.007)	(0.095)	(0.009)	(0.028)
Observations	860	860	860	860	860	860
R-squared	0.522	0.513	0.528	0.559	0.565	0.542
Year FE	YES	YES	YES	YES	YES	YES
Industry Composition	YES	YES	YES	YES	YES	YES
F-Stat	22.396		22.905		25.862	

Table 7: Panel A of this table reports the results from equation (6), a cross-sectional regression of openness at the end of our sample period on aggregate equal-weighted Tobin' q early in our sample period. The primary independent variable of interest is the time-series average of the equal-weighted aggregate Tobin's q between 2000 to 2004, while the dependent variable is the time-series average of NEW between 2015 and 2019. The control variables are time-series averages of annual MSA-level observations between 2000 and 2004. Panel B reports the results from equation (7), which regresses firm-level Tobin's q in the second half of our sample period (2010 to 2019) on openness (NEW) and Tobin's q in the first half of our sample period (2000 to 2009). Specifically, time-series averages of these variables within each of these periods are utilized. Industry fixed effects are also included in this specification. p-values are reported in parentheses, with ***, **, * indicating significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Value creation's impact on openness

Variables (2000-2004)	NEW (2015-2019)	
Tobin's q	0.019	0.010
	(0.303)	(0.635)
Stations		0.000
		(0.990)
Age		0.002
		(0.575)
Diversity		0.038
		(0.536)
Education		0.000
		(0.910)
Diversification		0.024
		(0.592)
Income		-0.006
		(0.960)
Pleasant Day		0.000
		(0.143)
Population		0.036**
		(0.031)
Density		-0.000
		(0.217)
R&D		-0.000
		(0.935)
Constant	0.034	-0.534
	(0.282)	(0.580)
Observations	44	44
R-squared	0.002	0.250

Panel B: Lagged openness's impact on firm-level value creation

Variables (2000-2009)	Tobin's q (2010-2014)			
NEW	2.610***	2.752*	1.031	1.371
	(0.005)	(0.054)	(0.244)	(0.309)
Tobin's q			0.323***	0.319***
			(0.000)	(0.000)
Stations		-0.022		-0.016
		(0.333)		(0.456)
Age		0.043		0.040
		(0.190)		(0.194)
Diversity		-0.805		-0.729
		(0.253)		(0.271)
Education		0.019		0.011
		(0.179)		(0.407)
Diversification		0.235		0.085
		(0.571)		(0.828)
Income		-0.443		-0.423
		(0.326)		(0.319)
Pleasant Day		0.002		0.001
		(0.179)		(0.435)
Population		-0.019		-0.018
		(0.869)		(0.873)
Density		-0.000		-0.000
		(0.623)		(0.616)
R&D		0.006		0.009
		(0.725)		(0.600)
Observations	1,246	1,246	1,246	1,246
R-squared	0.173	0.176	0.272	0.273
Industry FE	YES	YES	YES	YES

Table 8: Panel A of this table reports the results from equation (8) and its extension in equation (9) that regresses firm-level Tobin's q on openness as well as interaction variables that condition on firm age. Young firms are those aged 10 years or less, while old firms are those aged 30 years or more. In Panel B, predicted NEW variables based on the first stage of the instrumental variables procedure in equation (4) are used in the second stage described by equation (10). Industry by year fixed effects are included in the results of both panels. Panel C reports the results from estimating the specification in equation (8) separately within each of the 11 industries, and includes year fixed effects. *p*-values are reported in parentheses, with ***, **, * indicating significance at the 1%, 5%, and 10% levels, respectively.

Panel A: All firms and age subsets

NEW	2.255***	1.438***	0.265	0.265	1.841**	1.841**	0.997	0.146
	(0.003)	(0.010)	(0.660)	(0.660)	(0.015)	(0.015)	(0.193)	(0.833)
Young			-0.047	-0.047			-0.185	-0.202
			(0.687)	(0.687)			(0.156)	(0.147)
NEW × Young			3.372*	3.372*			3.392*	3.444*
			(0.067)	(0.067)			(0.054)	(0.056)
Old					-0.238**	-0.238**	-0.333***	-0.339***
					(0.023)	(0.023)	(0.006)	(0.005)
NEW × Old					-1.670	-1.670	0.123	0.096
					(0.198)	(0.198)	(0.889)	(0.911)
Stations		-0.008		-0.008		-0.008		-0.007
		(0.517)		(0.541)		(0.519)		(0.553)
Age		-0.013		-0.012		-0.009		-0.011
		(0.403)		(0.434)		(0.501)		(0.466)
Diversity		-0.631**		-0.645**		-0.596**		-0.603**
		(0.038)		(0.030)		(0.048)		(0.041)
Education		0.016**		0.016**		0.017**		0.017**
		(0.029)		(0.021)		(0.022)		(0.024)
Diversification		0.049		0.063		0.083		0.073
		(0.672)		(0.613)		(0.478)		(0.548)
Income		0.200		0.145		0.196		0.171
		(0.606)		(0.677)		(0.599)		(0.631)
Pleasant Day		0.003*		0.003*		0.003*		0.003*
		(0.077)		(0.096)		(0.089)		(0.093)
Population		-0.071		-0.073		-0.075		-0.075
		(0.271)		(0.261)		(0.216)		(0.219)
Density		0.000		0.000		0.000		0.000
		(0.309)		(0.296)		(0.269)		(0.272)
R&D		0.003		0.004		0.003		0.004
		(0.765)		(0.685)		(0.727)		(0.725)
Observations	26,849	26,849	26,849	26,849	26,849	26,849	26,849	26,849
R-squared	0.168	0.173	0.186	0.186	0.190	0.190	0.187	0.192
Industry × Year FE	YES	YES	YES	YES	YES	YES	YES	YES

Panel B: Instrumental variables procedure

	First-stage Instruments		
	Birthplace Diversity	Infrequent Names	Both
Predicted NEW	2.901*	4.152***	3.680***
	(0.070)	(0.000)	(0.000)
Stations	-0.010**	-0.011**	-0.011**
	(0.045)	(0.022)	(0.026)
Age	-0.021**	-0.027***	-0.025***
	(0.045)	(0.002)	(0.002)
Diversity	-0.571***	-0.474**	-0.510***
	(0.005)	(0.011)	(0.004)
Education	0.015***	0.014***	0.014***
	(0.000)	(0.000)	(0.000)
Diversification	0.044	0.036	0.039
	(0.598)	(0.666)	(0.639)
Income	0.134	0.075	0.097
	(0.414)	(0.628)	(0.519)
Pleasant Day	0.003***	0.003***	0.003***
	(0.000)	(0.000)	(0.000)
Population	-0.117**	-0.158***	-0.142***
	(0.041)	(0.001)	(0.000)
Density	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)
R&D	0.006	0.008**	0.007**
	(0.179)	(0.040)	(0.047)
Observations	26,708	26,708	26,708
R-squared	0.179	0.177	0.178
Industry × Year FE	YES	YES	YES

Panel C: Industry analysis

	Communication	Discretionary	Energy	Financials	Healthcare	Industrials	IT	Materials	Real Estate	Staples	Utilities
NEW	0.024	1.883**	-3.402*	1.397***	4.778**	-0.615	3.978***	0.955	0.791	5.228***	5.104***
	(0.984)	(0.014)	(0.053)	(0.002)	(0.032)	(0.389)	(0.002)	(0.177)	(0.299)	(0.001)	(0.000)
Stations	-0.092***	-0.025**	0.087***	0.001	-0.063**	-0.017*	0.026*	-0.013	0.001	0.041	0.004
	(0.000)	(0.022)	(0.010)	(0.851)	(0.020)	(0.066)	(0.065)	(0.167)	(0.888)	(0.252)	(0.600)
Age	0.049	0.068***	-0.105***	0.001	-0.060	0.013	-0.106***	-0.034**	-0.022*	-0.085**	-0.052***
	(0.237)	(0.000)	(0.000)	(0.844)	(0.172)	(0.189)	(0.001)	(0.031)	(0.054)	(0.013)	(0.000)
Diversity	-0.941*	-1.154***	-2.274***	-0.424***	-0.859	-0.775***	2.038***	-1.385***	-0.775***	-0.581	0.363***
	(0.052)	(0.001)	(0.005)	(0.002)	(0.222)	(0.001)	(0.000)	(0.004)	(0.004)	(0.445)	(0.001)
Education	0.041***	0.037***	0.026	0.003	0.025	0.041***	-0.029**	0.001	-0.024***	0.015	0.012***
	(0.008)	(0.000)	(0.158)	(0.174)	(0.148)	(0.000)	(0.013)	(0.910)	(0.000)	(0.150)	(0.001)
Diversification	0.157	0.427	-0.082	-0.047	0.014	-0.011	-0.118	-0.486***	0.049	0.114	0.298***
	(0.598)	(0.123)	(0.881)	(0.593)	(0.975)	(0.928)	(0.737)	(0.003)	(0.758)	(0.792)	(0.004)
Income	-0.604	-0.382	-0.829	-0.256	0.688	-1.141***	2.625***	1.057	1.304***	0.355	-1.175***
	(0.256)	(0.170)	(0.142)	(0.139)	(0.367)	(0.000)	(0.000)	(0.129)	(0.000)	(0.410)	(0.000)
Pleasant Day	-0.001	-0.003***	0.013***	-0.000	0.006***	-0.001	0.003***	0.006***	-0.002*	0.005*	0.006***
	(0.695)	(0.000)	(0.001)	(0.665)	(0.000)	(0.211)	(0.001)	(0.002)	(0.058)	(0.086)	(0.000)
Population	0.353***	0.178***	-0.263**	-0.044	-0.225	0.080	-0.391***	-0.301***	-0.058**	-0.327***	0.113***
	(0.007)	(0.003)	(0.048)	(0.112)	(0.127)	(0.116)	(0.000)	(0.002)	(0.037)	(0.000)	(0.002)
Density	-0.000**	-0.001***	0.001**	0.000***	0.001**	-0.000	0.000	0.000**	-0.000*	0.001***	-0.000***
	(0.021)	(0.000)	(0.015)	(0.000)	(0.013)	(0.353)	(0.495)	(0.038)	(0.063)	(0.000)	(0.000)
R&D	-0.001	0.013**	-0.041***	-0.008***	0.069***	-0.016***	0.009	0.002	-0.012***	-0.052***	0.013***
	(0.857)	(0.022)	(0.000)	(0.000)	(0.000)	(0.001)	(0.663)	(0.677)	(0.000)	(0.000)	(0.003)
Observations	1,039	3,620	3,166	5,486	3,174	3,222	2,917	1,288	1,458	899	580
R-squared	0.054	0.054	0.046	0.016	0.054	0.028	0.061	0.053	0.066	0.072	0.307
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table 9: This table reports results that account for variation in the composition of radio stations by music genre. These six genres are Pop, Rock, Adult Contemporary, Urban, Country, and Oldies. Panel A involves a modified proxy for openness created by aggregating across six genre-specific measures of openness at the level of individual radio stations. Panel B includes annual MSA-level genre proportions of each of the six genres, with Urban removed. p-values are reported in parentheses, with ***, **, * indicating significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Genre-adjusted openness

Genre-adjusted NEW	0.654***	0.414**
	(0.007)	(0.047)
Stations		-0.008
		(0.628)
Age		-0.012
		(0.444)
Diversity		-0.601**
		(0.040)
Education		0.016**
		(0.027)
Diversification		0.043
		(0.690)
Income		0.247
		(0.534)
Pleasant Day		0.003
		(0.117)
Population		-0.071
		(0.289)
Density		0.000
		(0.341)
R&D		0.003
		(0.798)
Observations	26,820	26,820
R-squared	0.167	0.173
Industry × Year FE	YES	YES

Panel B: Genre proportions

NEW	1.402**	1.438**	1.359**	1.172**	1.309**	1.399**	1.171**
	(0.011)	(0.012)	(0.016)	(0.019)	(0.011)	(0.010)	(0.017)
Pop	0.058						-0.037
	(0.879)						(0.946)
Rock		-0.187					-0.266
		(0.507)					(0.309)
Urban			0.384				
			(0.355)				
Country				-0.360			-0.421
				(0.136)			(0.270)
Oldies					0.210		0.035
					(0.516)		(0.951)
Adult Contemporary						0.096	-0.035
						(0.702)	(0.889)
Age	-0.012	-0.012	-0.010	-0.014	-0.013	-0.011	-0.016
	(0.530)	(0.500)	(0.594)	(0.451)	(0.461)	(0.522)	(0.450)
Diversity	-0.562**	-0.618***	-0.711**	-0.585**	-0.480**	-0.578**	-0.642*
	(0.032)	(0.009)	(0.020)	(0.018)	(0.038)	(0.016)	(0.086)
Education	0.016**	0.016**	0.016**	0.014*	0.015**	0.016**	0.014*
	(0.028)	(0.026)	(0.026)	(0.057)	(0.030)	(0.048)	(0.089)
Diversification	0.026	0.019	0.015	0.030	0.014	0.020	0.024
	(0.810)	(0.880)	(0.897)	(0.816)	(0.916)	(0.873)	(0.847)
Income	0.195	0.199	0.208	0.225	0.210	0.209	0.228
	(0.598)	(0.595)	(0.578)	(0.557)	(0.578)	(0.594)	(0.556)
Pleasant Day	0.003	0.003	0.003	0.002	0.003*	0.003	0.003
	(0.195)	(0.124)	(0.308)	(0.206)	(0.086)	(0.146)	(0.103)
Population	-0.079	-0.080	-0.088	-0.082	-0.077	-0.077	-0.084
	(0.209)	(0.202)	(0.118)	(0.203)	(0.213)	(0.201)	(0.142)
Density	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.398)	(0.372)	(0.457)	(0.344)	(0.361)	(0.334)	(0.371)
R&D	0.001	0.001	0.002	0.001	0.002	0.001	0.001
	(0.881)	(0.881)	(0.759)	(0.902)	(0.864)	(0.953)	(0.903)
Observations	26,849	26,849	26,849	26,849	26,849	26,849	26,849
R-squared	0.173	0.173	0.173	0.173	0.173	0.173	0.173
Industry × Year FE	YES	YES	YES	YES	YES	YES	YES

Table 10: Panel A of this table reports on the association between openness and new product introductions by firms, while Panel B removes young firms, aged 10 years or less, from this analysis. Besides the number of new product introductions, both panels report results for highly-successful new product introductions whose cumulative abnormal returns in the following three days are in the top quartile. Both panels also report results for the likelihood of highly-successful new product introductions, computed by normalizing the number of highly-successful introductions by the total number of introductions. *p*-values are reported in parentheses, with ***, **, * indicating significance at the 1%, 5%, and 10% levels, respectively.

Panel A: All firms

	Introductions		Successful Introductions		Success Likelihood	
NEW	17.019***	4.854**	8.961***	3.448**	0.660***	0.608**
	(0.001)	(0.022)	(0.001)	(0.044)	(0.000)	(0.040)
Stations		-0.114***		-0.047**		0.002
		(0.002)		(0.039)		(0.748)
Age		-0.030		-0.003		0.013*
		(0.152)		(0.818)		(0.079)
Diversity		0.271		0.177		-0.166*
		(0.411)		(0.567)		(0.070)
Education		-0.022		-0.006		0.003
		(0.174)		(0.484)		(0.184)
Diversification		3.594***		1.468***		-0.022
		(0.002)		(0.004)		(0.755)
Income		-0.348		-0.574*		-0.136
		(0.690)		(0.061)		(0.431)
Pleasant Day		-0.007**		-0.003***		0.000
		(0.019)		(0.002)		(0.365)
Population		1.539***		0.702***		0.010
		(0.000)		(0.000)		(0.628)
Density		-0.000		-0.000		-0.000
		(0.154)		(0.129)		(0.144)
R&D		0.018		0.002		-0.002
		(0.597)		(0.896)		(0.339)
Observations	3,469	3,469	3,469	3,469	3,469	3,469
R-squared	0.041	0.049	0.041	0.048	0.043	0.048
Industry × Year FE	YES	YES	YES	YES	YES	YES

Panel B: Excluding young firms

	Introductions		Successful Introductions		Success Likelihood	
NEW	24.921***	5.525**	12.881***	4.249**	0.749***	0.686**
	(0.000)	(0.024)	(0.000)	(0.036)	(0.000)	(0.010)
Stations		-0.092		-0.041		0.004
		(0.127)		(0.197)		(0.261)
Age		-0.036		-0.012		0.009
		(0.263)		(0.498)		(0.330)
Diversity		2.925***		1.282**		-0.149**
		(0.001)		(0.026)		(0.048)
Education		-0.012		0.000		0.003
		(0.587)		(0.996)		(0.171)
Diversification		4.751***		1.958***		-0.074
		(0.004)		(0.008)		(0.122)
Income		-1.483		-1.210***		-0.061
		(0.182)		(0.004)		(0.793)
Pleasant Day		-0.009**		-0.005***		0.000
		(0.025)		(0.004)		(0.381)
Population		2.343***		1.065***		-0.015
		(0.001)		(0.000)		(0.448)
Density		-0.001*		-0.000		-0.000
		(0.094)		(0.121)		(0.778)
R&D		-0.015		-0.012		-0.001
		(0.680)		(0.453)		(0.554)
Observations	2,194	2,194	2,194	2,194	2,194	2,194
R-squared	0.058	0.071	0.059	0.069	0.047	0.052
Industry × Year FE	YES	YES	YES	YES	YES	YES