Immigration and Rates of Entrepreneurship in Large U.S. Communities

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Abstract

Using U.S. county level data from the Business Information Tracking System (BITS) we revisit the influence of immigrants on business start-ups. We find that higher density of foreign-born immigrants has a positive impact on new business formation, but the relationship varies by the ethnic background of the immigrants and by industry type. Specifically, Caucasian immigrants, and to a lesser extent Asians, driving the positive relationship. Higher concentrations of Latinx immigrants, however, have either no or a predominately negative influence on business start-up rates. The predominately positive relationship between foreign-born and entrepreneurship varies significantly across different industries, particularly for Asians and Latinx. Care must be taken when making broad generalizations about the immigrant and entrepreneurship relationship. Specifically, there are significant variations across ethnic backgrounds and types of industries.

Introduction

One of the most contentious political issues in the United States today is immigration policy. Debates over the status of adults who were brought into the country illegally as young children, family reunification policies, who should receive and keep refugee status, and amount of the federal budget that should go toward enforcement of immigration laws are deeply dividing the country. Several scholars (e.g. Gonzalez, Collingwood and El-Khatib 2019; Gulasekaram, Pratheepan, Su and Villazor 2019; Casellas and Wallace 2018; and Oskooii, Drerer and Collingwood 2018) have noted that under the Trump Administration the debate around
immigration has escalated to the point that cities claim to be “sanctuary cities” are threatened with the loss federal funds or other potentially harmful targeted policies. Some, such as Longworth (2008), argue that these debates are pitting the interests of businesses that are struggling to find workers against citizens who perceive social costs such as cultural changes in their communities. As Hanson (2009) observes, some native-born Americans have concerns that immigrants adversely affect native-born people by taking away jobs, placing downward pressure on wages, and burdening public services. Others believe immigrants positively affect the economy by taking jobs that native-born workers are unwilling to take and contributing to local communities by spending their wages locally along with paying taxes (Hanson, 2009).

In the academic literature, several studies note that immigrants are an important source of entrepreneurial energy within a community and a disproportionate share of proprietorships, including the self-employed (e.g., Schuetze and Antecol 2006; Fairlie 2008; Fairlie and Lofstrom 2015). Using data from the U.S. Census Bureau’s Survey of Business Owners (2007 and 2012), Kerr and Kerr (2020) find that first-generation immigrants create about 25 percent of new firms and over 40 percent in some states (e.g., New York and California). Using data from the Global Entrepreneurship Monitoring (GEM) program, numerous studies have found similar patterns from Spain (Irastorza and Pena 2007), Luxembourg (Peroni, Riillo and Sarracino 2016) and the United Kingdom (Mickiewicz, Hart, Nyakudya and Theodorakopoulos 2017), among others.¹ In addition to this consistent finding in the economics literature, the same findings are widely reported in the management and sociology literature (e.g., Aliaga-Isla, and Rialp 2013; Li, Isidor, Li, Isidor,

¹ GEM began in 1999 as a joint project between Babson College (USA) and London Business School (UK). The aim was to consider why some countries are more 'entrepreneurial' than others. Details can be found at: https://www.gemconsortium.org/
Dau and Kabst 2018; Razin and Langlois 1996). Using data from the U.S. Census, Lofstrom (2015) calculated that between 2000 and 2014, 90 percent of the total growth in the self-employed can be attributed to immigrants. Further, since the Great Recession the number of native-born self-employed declined by slightly less than 1.3 million while the number of immigrant self-employed increased by over 270,000.

There is also growing evidence that within a rural setting, the growth in immigrants is renewing entrepreneurial activity. In a study of northern Utah Smith and Mannon (2020) find that immigrants, particularly Latinx, are drawn to employment opportunities in agriculture and food processing in rural communities and the growth in these populations create unique business opportunities filled by immigrants. In a study of rural Iowa and North Carolina Griffith (2020) finds evidence that the growth in immigrant entrepreneurs associated with the growth in Latinx populations takes two forms: those that are trying to supplement low wages in agriculture and manufacturing (food processing) through self-employment and those that are taking advantage of new market opportunities through the formation of formal businesses. While many of these latter businesses may be what Julien (2007) refer to as “mundane” entrepreneurs, or perhaps “ordinary”, such as coffee shops, beauty parlors, or resale shops, they often inject new lifeblood into rural communities, particularly downtown business districts.

This relationship between immigrants and entrepreneurship is important to understand because of the widely recognized importance of small business activity to overall economic performance (Collins and Low 2010). Numerous studies have documented the latter relationship between entrepreneurship, small business activity and economic performance (e.g., Acs, Audretsch, Braunerhjelm and Carlsson 2012; Audretsch, Keilbach and Lehmann 2006; Deller 2010; Henderson and Weiler 2010; Rupasingha and Goetz 2013; Tsvetkova, Partridge and Betz
Haltiwanger, Jarmin, and Miranda (2013) show that new businesses create a disproportionately large share of new jobs. Conroy and Deller (2015) document that, because net job growth from existing businesses tends to be close to zero, if not negative, in any given year, new businesses are critical to generating net positive job creation. Thus, rather than immigrants being a drag on the local economy by forcing wages downward, they could spur the economy through entrepreneurship.

Abramitzky and Boustan (2017) as well as Lassman and Busch (2015), however, note that a major challenge of this literature is that immigrants are extremely heterogeneous: some are highly educated and immigrating with employment-based visas (e.g., engineers, researchers, management executives, etc.) while others are entering the U.S. as unskilled workers or trailing spouses. Some immigrants speak English well, others do not; some are immigrating to live with families already in the U.S., others have no immediate support system in place to help with the transition. Jones, Ram and Villares-Varela (2019: 960) apply this heterogeneity to immigrant business owners and describe it as a polarity between “high fliers and survival entrepreneurs,” the latter often referred to as entrepreneurs of necessity. Because many of these immigrate survival or necessity entrepreneurs participate in the informal economy it is difficult to study and quantify the impact.2 The former, those immigrants with advanced degrees in particular, have been shown to not only have higher risk thresholds, but also stronger desires for autonomy, management and bringing new ideas and products to markets than native-born people with similar training (Kahn, La Mattina and MacGravier 2017). Indeed, Wang and Liu (2005) find

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2 These two extreme views of immigrant entrepreneurs are intended to provide insights into the potential spectrum of immigrant entrepreneurs and not intended to reflect the blending of these two extremes.
that U.S. firms with immigrant owners are more likely to export goods and services and have operations abroad and Brown, Earle, Kim and Lee. (2018) document a greater patenting/innovation rate for immigrant-founded firms.

Further complicating the immigration and entrepreneurship relationship is that attitudes toward entrepreneurs and entrepreneurship are embedded within the social and cultural norms of their community, both their community of origin and their new community (Gedajlovic, Honing, Moore, Payne and Wright 2013; Lassmann and Busch 2015; Mickiewicz, Hart, Nyakudya and Theodorakopoulos 2017). This can be seen in how religious traditions, for example, influence how people think about entrepreneurship with some religious traditions nurturing entrepreneurship, but others hindering it (Deller, Conroy and Markeson 2018; Hoogendoorn, Rietveld, and Stel 2016; Audretsch, Boente and Tamvada 2007, 2013). In another example, Collins and Low (2010), in a study of Asian entrepreneurs in Australia, find that cultural differences in gender roles can also play a role in understanding patterns in immigrant entrepreneurs.

While Shami, Mickiewicz and Stephan (2017) correctly note that immigrants differ from their home country nationals in attitudes towards risk and entrepreneurship, immigrants that are coming from countries where business ownership is prevalent will view entrepreneurship post-migration differently from those immigrants coming from countries were wage and salary employment is the norm. Treating immigrants as a homogenous group will likely lead to inconsistent and biased results which will, in turn, result in poorly thought-out and implemented community and economic development strategies. While regional and urban economists have explored the diversity of immigrants, in particular their education and skills, literature regarding
immigrants’ impact on local economic outcomes is far from sufficiently developed (Kemeny, 2017).

This study sheds additional light on how the ethnic background of immigrants influences rates of entrepreneurship for urban U.S. areas (counties) using the Business Information Tracking System (BITS) which tracks business formation, expansions, contractions and closures. We match the number of startups from 2010 to 2011 to the 2010 Census at the U.S. county level (n=457) for the most populous counties. The advantage of using the BITS data is that we can examine business start-up rates by industry type (two-digit NAICS level). Unfortunately, most studies of the immigrant and entrepreneurship milieu is that new businesses are treated in aggregate combining goods and service producing industries thus masking heterogeneity across industries or focus on a specific type of industry such as manufacturing or professional/technical services. By looking across ethnicities and industry types we add an additional layer of insights to the literature.

A significant disadvantage of the BITS data is that it only tracks those businesses with at least one paid employee thus losing self-employed proprietors who have no paid workers other than the owner him or herself and those in the informal, cash-based economy. While we do not have sufficiently detailed data on individual immigrant businesses the U.S. Census Bureau’s Survey of Business Owners (SBO) does provide some insights into how limiting our analysis to employee business only can introduce some distortions. In 2012, the most current year 11.2% of all businesses had no employees whereas for the share African-American businesses 15.1% have no employees, 14.2% of Latinx businesses and 11.5% of Asian businesses. The majority of businesses (50.4%) have between one and four employees with only a slightly higher share for
African-American (52.6%), Latinx (53.4%) and Asian (53.7%). Thus, while we cannot account for about one in ten businesses, we do account for the vast majority of businesses.

In this study, *immigrants* refers to people who were born in another country and lawfully moved to the United States. Estimates of *unauthorized immigrants* - who “entered the country without valid documents or arrived with valid visas but stayed past their visa expiration date or otherwise violated the terms of their admission” (Passel and Cohn 2018) are not considered in this study due to the lack of reliable data at the local (county) level. We measure immigrants as the concentration of foreign-born, the number of foreign-born per 1,000 population, counted in the 2010 Census, for each of three groups, namely Caucasian, Asian, and Latinx. Because we are using Census data, we are limited to an analysis of those immigrants who self-identified as such and declared a racial identification - not necessarily their country of origin. While we offer no prior expected hypotheses on how different racial and ethnic groups influence start-up rates across different industry types, we do find significant differences.

Beyond these introductory comments, the study is composed of four additional sections. First, we provide an overview of the literature’s current understanding of immigrants’ influence on economic outcomes with a particular eye on entrepreneurship. Next, we outline our empirical approach building on the existing literature. We then discuss our results and focus on how

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3 For a much more detailed discussion of the insights on immigrants and entrepreneurship using the micro Survey of Business Owners data see Kerr and Kerr (2020).

4 While these three classifications may appear narrow, finer classification reduced the variation within the data thus weakening the statistical strength of our modeling. For example, the concentrations of immigrants self-reporting as from Africa was small and highly concentrated in a few places (counties), thus weakening the statistical robustness of the results.
business start-up rates vary across ethnic background of the immigrants and industry type. We close by discussing possible policy options and future next steps in the research and policy agenda.

**Immigration and Economic Outcomes**

There is a broad literature on the relationship between immigration and economic outcomes. Much of the literature tends to focus on the educational characteristics of the immigrants (e.g., Kerr and Kerr 2011). Kemeny (2017) argues that much of this literature can be grouped into two categories: the impact of low-education and low-skill compared to native-born (e.g., Cortes 2008) and the impact of higher educated, higher-skilled immigrants on economic outcomes (e.g., Saxenian 2007). Looking specifically at labor market outcomes, immigrants that have higher levels of education tend to place upward pressure on wages, income and employment while those with lower levels of education place downward pressures on labor outcomes (Abramitzky and Boustan 2017).

Some studies focus on narrow geographic areas, such as Card’s (1990) examination of Cuban immigration into Miami, or, the numerous studies of the impact of immigrants from Mexico on U.S. labor markets. These studies of Mexican immigrants are mixed. Some find that immigrants are drawn from the middle of the educational distribution (e.g., Chiquiar and Hanson 2005; Orrenius and Zavodny 2005) but others find that immigrants are drawn from the low end of the educational distribution (e.g., Ambrosini and Peri 2012; Kaestner and Malamud 2014). Other studies, as argued by Dustmann, Schönberg and Stuhler (2016), use neoclassical
frameworks that are predisposed to yield certain results (e.g., Borjas 1999).\footnote{With a neoclassical framework, regardless of the stylized complexity, any increase in the supply of labor will place downward pressure on wages.} De Jong and Madamba (2001) find that rates of underemployment are relatively high amongst immigrants, particularly women, thus complicating the effect of immigrant education on labor market outcomes. Thus, the research on immigrant impacts is broad and nuanced.

Kerr and Kerr (2011) suggest that the literature seeking to better understand the impact of immigrants on labor market outcomes can be alternatively broken into three broad classifications: impacts on wages, impacts on employment, and displacement effects (i.e., immigrants displacing native-born workers). As noted above, the outcome of these broad studies is largely dependent on the educational attainment of the immigrant workers, the period of the analysis, the motivation to migrate, and the type of data used (i.e. undocumented immigrants and those operating informally are unlikely to be counted in quantitative data sets). The conditions of the larger labor market and regional characteristics can also influence the outcomes. Meta-surveys by Longhi, Nijkamp and Poot (2005, 2010) and Okkerse (2008) found comparable, small effects across many studies. Indeed, Borjas (2003, p.1335) recently noted that “the measured impact of immigration on the wages of native-born workers fluctuates widely from study to study (and sometimes even within the same study) but seems to cluster around zero” suggesting small effects if any on net. In essence, the labor market elasticities associated with immigrants tend to be statistically significant but economically insignificant.

Within the literature on immigration and labor market outcomes, there is a growing line of research on immigrant entrepreneurs that highlights their wide heterogeneity (Mickiewicz, et al. 2017). Strömblad (2016) notes that higher self-employment amongst immigrants might be
more out of necessity than choice because wage and salary employment may be more difficult to obtain (Chaganti, Watts, Chaganti, and Zimmerman-Treichel 2008; Li 2001). While Bird and Wennberg (2016), Sanders and Nee (1996), as well as Portes (1995), argue that initially being self-employed can help immigrants become more integrated into the local community and economy and open up wage and salary employment opportunities, it is not readily clear if these “entrepreneurs of necessity” have the same type of impact on regional economic growth and development as Schumpeterian or innovative entrepreneurs. More generally, there a few studies that look at how the presence of diverse immigrant populations impacts entrepreneurship outcomes. Kemeny (2017), for example, finds a positive relationship between entrepreneurial activity and immigrant racial diversity (e.g., Audretsch, Dohse and Neibuhr 2010; Quin 2013; Jones Ram and Villares-Varela 2019).

Consistent with the broader literature on the impact of immigrants on labor markets, the educational and skills attainment of the immigrant play a vital role in understanding their relationship to entrepreneurship. Kahn, La Mattina, and MacGarvie (2017) note that there is a U-shaped relationship between immigrant education and entrepreneurial activity. Less educated immigrants tend to be more likely to be self-employed, which is consistent with the entrepreneurship of necessity hypothesis. The propensity for self-employment then tapers downward as education increases, only to eventually swing upward for more highly educated immigrants. Kahn, La Mattina, and MacGarvie (2017) find the U-shape patterns holds true for what they deem as “non-science” related types of businesses, but does not hold for science related businesses, perhaps because there are more restrictive constraints on starting a science-based business that prevents entry by less-educated entrepreneurs. Research has suggested that immigrants also tend to be more tolerant of risk (Jaeger, Dohmen, Falk, Huffman, Sunde and
Bonin 2010), which is intuitive given the revealed risky behavior of immigrating to a different country, and particularly in terms of bringing research-based products to market (Roach and Sauermann 2015). Thus in combination with higher risk tolerance, highly educated immigrants are more likely to exhibit the characteristics associated with Schumpeterian entrepreneurs who are vital to economic growth and development.

Using data for 32 countries from the Global Entrepreneurship Monitor (GEM) Lo, Isidor, Dau and Kabst (2018) test the knowledge spillover theory of entrepreneurship and find supporting evidence of the idea that a denser immigrant population can foster entrepreneurial activity. That is, a greater diversity of networks between natives and immigrants fosters a greater flow of new information and ideas; having a diverse immigrant population that is accepted by the native population can foster entrepreneurial activity (Hernandez, 2014; Hornung, 2014). Consistent with the findings of Deller, Conroy and Markeson (2018), the density and diversity of networks matter in rates of entrepreneurship and a higher concentration of immigrants adds to that diversity. Bizri (2017), in an analysis of “refugee entrepreneurs”, finds that density of networks within the refugee community, and the openness of the receiving community, plays a fundamental role in understanding their small business activity. As with many who elect to immigrate, especially refugees, Bizri notes they have a “one-way-ahead” attitude that is conducive to starting their own businesses.

Lassman and Busch (2015) note that the country of origin can greatly influence the entrepreneurial behavior of immigrants. In some parts of the world, self-employment and entrepreneurial behavior is more common than in other regions and these patterns will spill over onto the receiving country. In a study of immigrants to the U.S., Lassman and Busch find that length of time since the migration and second-generation status can dampen levels of self-
employment. This is consistent with the argument that initial self-employment can help immigrants integrate into the local economy thus creating wage and salary employment opportunities, particularly for subsequent generations (Bird and Wennberg 2016; Sanders and Nee 1996; Portes 1995). In the same vein as Lassman and Busch (2015), Chreim, Spence, Crick and Liao (2018) find that within the women immigrant entrepreneurship literature, ethnic traditions plays an important reoccurring theme. The cultural differences of the countries of origin for the immigrants, particularly the role of women in business, must be considered to understand their entrepreneurship patterns.

**Empirical Modeling**

To help gain some insights into these basic questions of the relationship between entrepreneurship and economic outcomes, we use new business formation data from the Business Information Tracking System (BITS) which tracks business formation, expansions, contractions and closures. We match the number of startups from 2010 to 2011 to 2010 Census data at the U.S. county level. The advantage of using the Business Information Tracking System (BITS) is that BITS includes only employer establishments and a new business is indicative of a transition from zero to at least one employee. That is, a new firm may be starting at the outset with employees or is transitioning from an existing sole propitiator or self-employed person to a business with hired employees. Thus, the concerns expressed by Strömblad (2016) and others that much of the immigrant-entrepreneurship relationship identified in the literature is capturing entrepreneurship of necessity, which may or may not contribute to the growth and development of the local economy, is minimized. The second advantage of using the BITS data is that firms are tracked at the two digit NAISC level thus allow the analysis to gain insights into the types of
businesses associated with foreign-born populations as well as nationalized citizens. Following the work of Kahn, La Mattina, and MacGarvie (2017) we would expect that immigrants are more likely to be associated with one type of business classification over another.

We model the startup rate as a function of the concentration of the foreign-born population, measured as the number of foreign-born that are Caucasian, Latinx, and Asian per one thousand total population and the change in the percent of the population foreign-born from 2000 to 2010. The focus of the analysis is the concentration of foreign-born by racial and ethnic background. We include the change in the relative size of the immigrant (foreign-born) population to capture cumulative effects of expanding immigrant populations. Razin and Langlois (1992, 1996) note that immigrants tend to use networks within their own immigrant community to facilitate entrepreneurial activity. Mickiewicz and colleagues (2017) find that a community with a growing immigrant population can enhance entrepreneurial activity along several fronts. First, growing immigrant populations can build within immigrant community networks that are vital to business startups. Second, communities that are more receptive to a growing immigrant population tend to be more entrepreneurial in general. Third, enhanced diversity represented by a growing immigrant population creates expanded market opportunities and the potential for richer networks. In the terminology of social capital, Mickiewicz and colleagues (2017), among others (e.g., Smallbone, Kitching and Athayde 2010), find that increasing and diverse immigrant populations build bridging capital across different groups within the community. Thus, we expect that growth in the concentration of immigrant populations should place upward pressure on entrepreneurial activity.

The basic model can be expressed as:
\[ E_{i,j} = f (EFB_{i,k}, \Delta EFB_{i,t \rightarrow t-1}, SD_{i}, SC_{i}, AM_{i}, EB_{i}) \]

where \( E_{i,j} \) is the rate of business start-ups for the \( i \)th county within the \( j \)th industry classification (at the two digit NAICS system, or \( j = 1, \ldots, 16 \), for a total of 17 models to be estimated, one for all industry classifications aggregated into a total, and 16 industry classification models) where rates are the number of new business per 10,000 employees within the county. We use employment to normalize startups rather than population because employment better reflects concentrations of economic activity and thus business opportunities. Our two measures of foreign-born (\( EFB_{i,k} \)) are the percent of the county foreign-born for ethnic class \( k \) (Caucasian, Asian, Latinx) as well as the concentration of foreign-born defined as the number of foreign-born per 10,000 population. \( \Delta EFB_{i,t \rightarrow t-1} \) is the change in the percent of the county population that is foreign-born from 2000 to 2010, \( SD_{i} \) a set of sociodemographic variables, \( SC_{i} \) is a social capital measure, \( AM_{i} \) is a set of amenity measures and in this study climate related measures, and \( EB_{i} \) is a simple economic characteristic measure.

The approach that we adopt is a simple reduced form model that is a partial representation of a more complex system of entrepreneurship. If one adopts a systems thinking approach to the regional economy, such as the Shaffer Star (Shaffer, Deller and Marcouiller 2004, 2006) or the Community Capitals (Emery and Flora 2006; Pigg, Gastefer, Martin, Keating and Apaliyah 2013), each component of the economy and the larger community is interdependent on each other. More relevant to this study are the notions around entrepreneurial ecosystems (e.g., Isenberg 2008; Mason and Brown 2013; Grant, Padmanaban and El-Kebbi 2018). Here the idea is that entrepreneurs function and are supported by a complex interlacing systems of factors ranging from human capital, social capital, and financial capital to name a
few. Indeed, the overlap between the Community Capitals of Emery and Flora and formation of systems thinking frameworks around entrepreneurial economic systems is significant.

Within a systems thinking approach everything is endogenous and self-reinforcing. This can create problems for simple reduced form models because feedback mechanisms are ignored. The standard approach to this problem is to adopt instrumental variables but within a systems thinking view instruments would be required for every variable within the model. Not only is this impractical but also introduces significant measurement error and the instruments are often impractical for policy recommendations. For this study, we acknowledge the presence of an entrepreneurial ecosystem that is subject to multiple sources of feedback and self-reinforcing mechanisms. Rather than argue that immigration “causes” entrepreneurship we maintain that the data are consistent, or inconsistent, with the theoretical framework.

The sociodemographic measures include percent change in the population 2000 to 2010 to represent regional growth patterns, the percent of the population as 0 to 17 as well as the percent of the population age 65 and over, and finally population density to reflect the degree of urbanness of the county. Following the findings of Henderson and Weiler (2010) as well as Markeson and Deller (2012) we expect faster growing counties (change in population) and more densely populated urban counties to have higher rates of entrepreneurship. We also expect counties with a younger (age 0 to 17) and older (over age 65) population to have lower rates of entrepreneurship. While it is intuitive that communities with a higher concentration of school age children will tend to be less entrepreneurial, ceteris paribus, the literature on an older population and entrepreneurship is less conclusive. Work by Kautonen, Down and Minniti (2014) as well as Akgün, Baycan-Levent, Nijkamp and Poot (2011) and Singh and DeNoble (2003) find that many people at retirement age elect to transition out of wage and salary
employment and into entrepreneurship. The research, however, suggests that this transition is occurring for people in their mid to late 50s and may not play as significant a role above age 65.

Both Storey (1991) and Audretsch, Keilbach and Lehmann (2006) note that population density is an important predictor of the number of business start-ups as it captures the thickness of potential markets: thicker markets reflect greater opportunities for new businesses. Thus, we also control for population density and expect a positive relationship. To further reflect the density of local markets relative to entrepreneurship we also include the share of total employment that comes from proprietorships. This measure captures the breath of entrepreneurship within the community or region and higher concentrations would be reflective of communities that tend to be more entrepreneurial in general. In the framework of social capital, a community with more self-employed persons would be more receptive to people starting their own businesses. We expect a positive relationship with this control variable.

Following the logic detailed in Markeson and Deller (2015), Deller, Conroy and Markeson (2018) and Lo, Isidor, Dau and Kabst (2018), we expect communities with higher levels of social capital to provide greater networking opportunities for potential and existing entrepreneurs, thus creating a more plenteous environment for business start-ups. The fundamental elements of social capital, networks, trust, and shared norms of behavior, could be one mechanism that leads to more entrepreneurial activity among immigrants. Bird and Wennberg (2016) and Razin and Langlois (1992) find that this higher rate of self-employment among immigrants is found in geographic areas with higher concentrations of immigrants suggesting a self-reinforcing mechanism. These higher concentrations of immigrants provide the networking and access to resources necessary to start and build a business including access to successful immigrant business owners who can serve as role models. One could think of this as
strong bonding social capital within the immigrant community that facilitates entrepreneurial activity (Ram, Theodorakopoulos and Jones 2008; Aldrich and Kim 2007; Light and Dana 2013). While some, such as Jones, Ram and Villares-Varela (2019), have questioned the value of social capital theory as a framework to understand the immigrant-entrepreneurship interface, the notion of networks and flows of trusted information is too well grounded in the economics, sociology and management literature to ignore. As such, we use the social capital index offered by Rupasingha, Goetz, and Freshwater (2006) (updated to 2010) who use principal component analysis to combine several factors such as the concentration (number per capita) of non-profits, religious organizations, and gathering places, among others, into a single scalar index. Higher values of the index are associated with higher levels of social capital.\footnote{The data used to construct the social capital measure are available here: https://aese.psu.edu/nercrd/community/social-capital-resources} It is important to note that this measure of social capital cannot assess the degree to which immigrants have access to or participate in these networks. Clearly, communities with low levels of social capital, proxied by the Rupasingha, Goetz, and Freshwater index, will be more detrimental to immigrants than those with higher levels. One could think of access to social capital is a necessary but not sufficient condition for immigrant entrepreneurs.

In a classic study of regional employment and population growth, Carlino and Mills (1987) found that warm climate plays an important role in general growth patterns. A broader set of climate variables were shown to be positively associated with employment growth in studies by McGranahan (1999) and Partridge, Rickman, Ali and Olfert (2008). Focusing more narrowly on concentrations of proprietorships, a very simple measure of self-employment, Markeson and Deller (2012) find that climate can play an important role in understanding spatial
patterns of entrepreneurship. In essence, places with higher average January temperature and lower average July humidity are expected to experience higher rates of overall economic growth and entrepreneurship. We expect places with warmer winters and drier summers to have higher levels of entrepreneurial activity.

We include five broad measures describing the economic characteristics of the community: the unemployment rate, the percent of households with less than $10,000 of income, the percent of households with income more than $200,000, the percent of employment in goods producing sectors, and the population-employment ratio. Goods producing sectors include extractive industries (e.g., farming, forestry, mining), construction, utilities and manufacturing. We expect higher unemployment rates, lower income and greater dependency on goods producing sectors to tamper entrepreneurial activity while higher income communities will have more entrepreneurial activity. While one could argue for higher unemployment rates and concentrations of low-income households driving entrepreneurship of necessity among immigrants, analysis by Faria, Cuesta and Gil-Alana (2009) and Faria, Cuesta and Mourelle (2010) find that the unemployment and entrepreneurship relationship is dynamic and nonlinear. In essence, the unemployment and entrepreneurship relationship varies by severity, duration of periods of unemployment and the degree of support programs for the unemployed. This complex relationship explains, in part, the findings of Parker’s (2009) review of the literature on the interplay between unemployment and entrepreneurship where some studies find a positive relationship, others a negative and some find no relationship.

While we expect higher concentrations of low-income households to dampen formal, visible entrepreneurship, due primarily to the lack of access to financial resources (self-funding or credit/debt) as well as weaker markets for business activity, it may be the case that
entrepreneurship of necessity, or Jones, Ram and Villaes-Varela’s (2018) “survival
entrepreneurs,” dominates the relationship. Conversely, a higher concentration of high-income
(greater than $200,000) households should see higher rates of entrepreneurship of opportunity
through stronger markets for business activity. In addition, higher-income households have
greater access to financial resources to start and sustain businesses.

In a study of persistent joblessness in the U.S., Amior and Manning (2018) find that the
simple employment to population ratio is a strong predictor of joblessness and argue that the
employment rate can serve as a sufficient statistic for local well-being. Within the community
development literature (e.g., Shaffer, Deller and Marcouiller 2004), researchers find that the
inverse, or population to employment ratio, is a strong indicator of local economic conditions.
Within any given community, population is a crude measure of demand and employment is a
crude measure of supply. In a business development context, high population to employment
ratios for any given industry might point to entrepreneurial opportunities within the local market.
In addition, high population to employment ratios can point to communities with higher out-
commuting patterns (e.g., bedroom communities) or, as argued by Amior and Manning (2018),
an indication of underserviced markets. Thus, following Amior and Manning we include the
employment to population ratio as a control.

We also include three additional economic characteristics to control for potential access
to financing. This includes the number of commercial banks per 1,000 persons and two
measures of home ownership characteristics. The greater the concentration of banks is a simple
indicator of greater access to formal sources of financing which can foster higher rates of
entrepreneurship (Naudé, Gries, Wood and Mientjies 2008). A higher bank concentration in a
region increases the competition for potential business customers amongst banks thus reducing
some financial constraints on business start-up activity. It is not clear, however, the extent to
which immigrants have access to these traditional sources of financing.

We include two housing measures, the percent of housing units that are owner occupied
as well as the percent of those owner occupied that spend more than 35 percent of household
income on housing. The owner-occupied housing measures are included as many entrepreneurs
use equity in their houses to help finance their start-ups (Fairlie 2013). Thus, we expect that the
higher the concentration of owner occupied houses, the greater the rates of entrepreneurship.
This hypothesis, however, hinges on the ability of the homeowner to use equity in the house to
raise start-up capital. As with access to formal financing through banks it is not clear if
immigrants are able to tap into equity in the form of homeownership. In addition, if the
homeowner is experiencing “housing stress”, the ability to use the house as collateral for a
business loan will be limited. Unfortunately, as noted by Nepal and Tanton (2010) and Rahman
and Harding (2014), definitions of housing stress is highly *ad hoc* with some researchers using
25 percent of household income on housing costs while others use 40 percent. While the U.S.
Census American Community Survey reports housing expenditures across several income
thresholds, the most restrictive is at the 35 percent level. Thus, for our analysis we use the 35
percent threshold and expect that the higher the share of owner occupied households that spend
at least 35 percent of their income on housing, the lower the rates of entrepreneurship.

In addition, it is widely accepted that modeling economic activity using U.S. county level
data is subject to spatial dependency within the data. Specifically, the geographic boundaries
defined by counties do not coincide with the relevant economic region. As evidence of this,
there are strong commuting patterns across county lines, particularly across individual counties
that make up a larger metropolitan area. A complicating factor, however, is that we focus on
larger more populated or urban counties which means that rural or nonmetropolitan counties are not included in our analysis. From a purely mechanical perspective, our “geographic world” has holes in the spatial landscape. The economic activity of, for example, Indianapolis may spill over and influence Chicago, Detroit and Cincinnati, but the rural areas between those cities are removed from the analysis. We can address this complex spatial spillover effects in one of two ways: (1) the spillover violates the assumption that the observations are independent, and the error covariance is non-zero, or the $e \sim N(o, \sigma\Omega)$ where $\Omega \neq I$, (here the spatial dependency is a nuisance), or (2) there is a more structured relationship across spatially proximate observations and we know that what happens in one county directly influences neighboring counties. Because of the “holes” in our geographic world it is difficult to make theoretical arguments in favor of more structured spillover effects, thus we treat the spatial dependency as more of a nuisance and employ the Spatial Error Model (SEM) stated more formally as

$$y = \beta WX + e, \quad e \sim N(o, \sigma\Omega), \quad \Omega = [(I - \rho W)'(I - \rho W)]^{-1}$$

Here the spatial weight matrix $W$ captures the spatial proximity of neighboring counties and the spatial lag parameter $\rho$ reflects the degree of dependency. This approach will allow for higher levels of efficiency in our estimates.

**Empirical Results**

We estimate a total of 18 versions of the model reported in Tables 2 and 3. The models vary in two ways. For all business start-up rates, we estimate the model with just the control variables (Table 2, Model A), and then we add the three foreign-born concentration variables
(Table 2, Model B). The second way we vary the model is by grouping business start-up rates by industry type (Table 3). For space considerations, we do not report the results of the control variables for the start-up rates by industry type. Before turning to the variable results, the two aggregate models perform as expected with Model A explaining 78.1 percent of the variation in total business start-up rates, and Model B, which includes the three foreign-born measures, explaining just over 80 percent of the variation. In both models, the spatial parameter ($\rho$) is positive and statistically significant reaffirming the spatial dependency within the data. The positive value is as expected and suggests that the nearby counties tend to have a positive influence on each other.

Examining the results on the three variables of interest (concentration of foreign-born by group) we find that adding these variables to the base model does improve the performance of the model and a simple comparison of the value of the log likelihood function suggests that the three variables as a block are statistically significant with a p-value less than 0.0001. The results on the individual immigrant variables establish a pattern that is consistent when we examine start-up rates by industry type. Specifically, a higher concentration of Caucasian immigrants has a large (relative) positive impact on total start-up rates, while Asian influence is positive but statistically insignificant.

A higher concentration of Latinx immigrants has a statistically significant negative impact on start-up rates. The latter result on Latinx immigrants is likely driven by these immigrants being drawn into wage and salary employment which overwhelms their influence as entrepreneurs, based on available data. Alternatively, the communities with larger concentrations to of Latinx immigrants may also be those with other entrepreneurial barriers—limited lending activity, infrastructure, and business support entities for example, which could explain this result.
It is also possible that Latinx entrepreneurs are self-employed but do not have formal employees and as such not captured by the Business Information Tracking System (BITS) data that includes only those businesses with employees. Further, we do not have reliable data on either the level of undocumented workers or those in informal, cash-based, business activity. Indeed, in Griffith’s (2020) analysis of Iowa and North Carolina many immigrants that have wage employment also have informal part-time side-jobs that could be thought of as self-employment and this activity is lost to our analysis. What is commonly observed in rural communities, which are not included in this analysis, is that wage employment opportunities, such as in livestock farming and food processing, attracts many Latinx immigrants and a handful start local businesses. For many of these rural communities, downtowns see a number of Latinx owned businesses, but the relative numbers compared to wage employment is small. So while these Latinx businesses are an injection into the local business environment they are overshadowed by the wage employment.

Before turning to the results by industry type, consider what additional insights we can gain on entrepreneurship rates based on our control variables. The results are generally consistent between the base model (Model A) and the expanded model (Model B) with a few interesting exceptions. Community characteristics that have a consistent positive impact on entrepreneurship rates generally include growth in population, population density, concentration of commercial banks, share of total employment from proprietorships, and unexpectedly, the share of homeowners that are classified as facing fiscal stress. We hypothesized that homeowners facing housing financial stress would be less likely to be able to leverage equity in their houses to finance business start-ups and this appears to not be the case. A simple mapping of this variable, however, reveals that counties with more households in this classification are
clustered on the east and west coasts which tend to have more dynamic (e.g., more start-ups) economies. The other four control variables perform as expected.

There are three control variables that have consistent negative effects on start-up rates: unemployment rate, share of employment in the goods producing sectors, and the employment to population ratio. The negative effect of the unemployment rate is not as expected given the nature of entrepreneurship of necessity, but given the findings of Faria, Cuesta and Gil-Alana (2009) and Faria, Cuesta and Mourelle (2010) it is likely that the simple unemployment rate is an over-simplification of a complex unemployment and entrepreneurship relation. It is likely that higher unemployment rates are capturing the lingering effects of the Great Recession. Given Amior and Manning’s (2018) finding that the simple employment to population ratio is a strong predictor of joblessness, the negative finding related to entrepreneurship is as expected.

There are five control variables that are not statistically significant in either Models A or B: change in the percent of the county population that is foreign-born; share of the population over age 65; the social capital measure; average July humidity; and percent of low-income households. We expected the growth in immigrant density and the social capital measure to have a positive influence on start-up rates for complementary reasons and the insignificant finding is not consistent with the larger entrepreneurship literature. The non-result on those over age 65 is not completely unexpected whereas the older entrepreneur relationship appears to hold strongest for those in the pre-retirement age groups (Deller, Kures and Conroy 2018). We also expected to find a negative relationship with July humidity and higher concentrations of very low-income households, but neither are statistically significant.

There are four control variables that have results that vary across the base model (Model A) and the full model (Model B). The share of the population that is under age 18 has the
expected negative coefficient in the base model, but is insignificant. In contrast, this variable is positive and weakly significant in the full model. Average January temperature has a positive coefficient in both models, as expected, but it is insignificant in the base model and only weakly significant in the full model. The concentration of higher income households has the expected positive and significant relationship in the base model, but becomes negative and insignificant in the expanded model. Finally, the share of houses that are owner occupied has a positive coefficient in both models, as expected, but is statistically significant in only the expanded or full model. The inconsistent results in the growth of the foreign-born population and the social capital measure that are the most troublesome as these results are not consistent with the literature.

The more interesting results are provided in Table 3 where we estimate the full model with respect to start-ups by industry type. A detailed discussion of each industry across all three race and ethnic groups would be both tedious and unnecessarily long, so we will focus on the general patterns in the findings. First, a higher concentration of foreign-born Caucasians has a positive and significant effect on 13 of the 16 different industry types. The three where this relationship is not statistically significant are in agriculture, transportation services, and arts, entertainment and recreation. These results strongly support the notion that higher concentrations of immigrants, particularly those from eastern and western Europe along with the eastern parts of Asia, which dominates this classification, tend to place upward pressure on rates of entrepreneurship.

The results for immigrants that are of Asian or Latinx heritage are much more inconsistent than those for Caucasians in terms of the importance of their concentrations and the direction of the relationship to start-up rates. A higher concentration of Asian immigrants is
statistically related to start-ups in only eight of the 16 industry types and there is evidence of both positive and negative relationships. For example, a higher concentration of Asian immigrants is linked to lower rates of start-ups in agriculture, construction, administrative support services and waste management, and arts, entertainment and recreational services. At the same time, Asian immigrant concentration has a positive influence on start-up rates in professional, technical and scientific services, wholesale trade, and transportation services.

Latinx immigrants are statistically important in helping us understand the start-up rates in nine of the 16 industry types examined and as with the Asian immigrant population, Latinx immigrants have a positive influence in some industries and a negative influence in others. A higher concentration of Latinx has a positive influence on start-ups in wholesale and transportation services, but a negative influence on construction, manufacturing, real estate, rental and leasing services, administrative support services and waste management, health care services, educational services, and the general other services industry which tends to be dominated with personal services. The predominance of negative relationships across industry types confirms the more general result of higher concentrations of Latinx on total business start-ups (Table 2, Model B).

When we view these results in total, we can draw several inferences about the influence of immigrants on rates of entrepreneurship. First, there is a statistically significant positive relationship between immigrants and rates of entrepreneurship within the U.S. Larger U.S. counties with a higher concentration of foreign-born persons tend to have higher rates of entrepreneurship. Second, this relationship varies by ethnic background with Caucasians, and to a lesser extent Asians, driving the positive relationship. Higher concentrations of Latinx, however, have either no influence or a predominately-negative influence on business start-up
rates. While we cannot draw specific inferences based on our analysis, it may be that Latinx are
drawn more into wage and salary employment. Third, the predominately-positive relationship
between the presence of foreign-born residents and entrepreneurship varies significantly across
different industries, particularly for Asians and Latinx. While the aggregate results support that
notion that immigrants tend to put upward pressure on the rates of entrepreneurship within a
community, such a blanket generalization cannot be applied across all types (race or ethnicity) or
types of industry.

Discussion and Conclusions

International migration into the U.S. remains a politically charged issue. Concerns are
expressed that immigrants drive down wages, take the jobs of native-born residents, place
pressure on public services such as health care, and lead to higher rates of crime. One growing
line of research suggests that immigrants into the U.S. and other developed economies (e.g.,
Europe) tend to be more entrepreneurial than native-born. Studies have consistently found that
immigrants tend to be self-employed or the owners of businesses at higher rates than native-born
residents. If entrepreneurship and the formation of new businesses is vital to economic growth
and development, and foreign-born immigrants tend to be more entrepreneurial, then these
international migrants may be an important component of local strategies. To explore this
potential relationship, we model the influence of the concentration of foreign-born people on
business start-up rates using a sample of the larger U.S. counties.

While our results generally support that notion that communities with a higher
concentration of immigrants tend to be more entrepreneurial, as measured by business start-up
rates, the results vary across racial/ethnic group and specific industry types. We find that those
immigrants classified as Caucasian tended to have the strongest positive relationship with entrepreneurship which was largely consistent across different industry types. The number of Asian immigrants had a positive impact within some industries, particularly professional, scientific and technical services, but negative impacts on others, such as arts, entertainment, and recreation and no influence on some, such as information, or finance and insurance services. In addition, we found that immigrants with Latinx heritage tended to correspond to lower overall rates of observable entrepreneurship and had a positive influence on only the wholesale trade as well as the transportation sectors. Thus, the broad results that immigrants are more entrepreneurial than their native-born counterparts hide a more complex reality.

Entrepreneurial propensity varies by racial/ethnic group and culture. Even within a particular group, it is likely that immigrant status is large factor, as could be language, finances and their support network. Thus, entrepreneurship for immigrants, much like for any other group, is nuanced and such be considered within a systems thinking approach. Informed strategies for entrepreneurship should consider racial and ethnic background of the immigrant, their particular needs, as well as the context in which they start their business, such as access to capital, relative size of the local market, and industry characteristics. Entrepreneurial development strategies that may be appropriate for native born people may be inappropriate for immigrants. For example, existing business support networks, such as business associations, may be welcoming to native born but uncomfortable with immigrant business owners.

Further, one must keep in mind that in this study we are modeling only formal business activity and do not capture the effects of undocumented immigrants, those that are self-employed with no other employees, or work in the informal economy. Including these hard-to-track categories may reveal new patterns. For example, if immigrants are more active in the informal
economy which has lower barriers to entry, these entrepreneurs may be a good match for additional support. With appropriate resources, some of these business operators may prefer to formalize and expand their businesses. Similarly, immigrants may often choose to be self-employed and run small businesses without employees, again, partly because of the low barriers to entry. These entrepreneurs may also be a good match for additional business support if they would like to expand their businesses. Thus, the distribution of immigrant entrepreneurs across these different categories is an important area for future research.

Though this study does not point to explicit policies, it does suggest some opportunities to learn how to better support immigrant entrepreneurs. The relatively strong results for Caucasian and Asian immigrants indicate that these groups are better positioned to succeed. These groups may offer some general strategies that could be replicated for others. For example, perhaps given the same information, education, access to capital, and network support, Latinx immigrants would have similar entrepreneurial outcomes and build a more dynamic local economy. Further, immigrants should not be treated as a homogenous group as there are historic and cultural differences across racial and ethnic groups. Studying the Latinx community specifically and understanding their unique constraints and challenges may also lead to improved outcomes. For example, Latinx immigrants may face uniquely adverse conditions in some communities if they are unwelcomed and disconnected from current residents. Overcoming this aspect of forming inclusive communities could be important as past work suggests that communities that are more receptive or welcoming of immigrants will create an environment that is more conducive to small business activity.

Taken together, the local context matters in how immigrants are received within the community, having access to networks, but within the immigrant community (bonding social
capital) and across the larger community (bridging social capital), access to business support programs that reflect cultural differences, particularly language barriers, and access to finance beyond family and friends, all matter. In the end, there will be a circular causality, or agglomeration effect, that is self-enforcing; as more immigrants become entrepreneurial, the success of these businesses will be self-enforcing within and outside the immigrant community. But community level policies that are aimed to foster entrepreneurship within the immigrant population must be aware of racial, ethnic, and cultural differences and barriers.
References


Table 1: Descriptive Statistics

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Source</th>
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<td>0.01</td>
<td>0.00</td>
<td>0.09</td>
<td>BITS</td>
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<td>Construction</td>
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<td>0.04</td>
<td>1.29</td>
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<td>0.00</td>
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<td>Arts, Entertainment and Recreation</td>
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<td>0.00</td>
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<td>0.41</td>
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<table>
<thead>
<tr>
<th>Key Variables of Interest</th>
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<tbody>
<tr>
<td>Percent of the Foreign Born Caucasian</td>
</tr>
<tr>
<td>Percent of the Foreign Born Asian</td>
</tr>
<tr>
<td>Percent of the Foreign Born Latino/a</td>
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</table>

<table>
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<th>Control Variables</th>
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<tr>
<td>Change in the Percent of the Population Foreign Born 2000 to 2010</td>
</tr>
<tr>
<td>Population Growth Rate 2000 to 2010</td>
</tr>
<tr>
<td>Percent of the Population Age Under 18 Years</td>
</tr>
<tr>
<td>Percent of the Population Age 65 Years and Over</td>
</tr>
<tr>
<td>Population Density</td>
</tr>
<tr>
<td>RGF Social Capital Index</td>
</tr>
<tr>
<td>Average January Temperature</td>
</tr>
<tr>
<td>Average July Humidity</td>
</tr>
<tr>
<td>Unemployment Rate</td>
</tr>
<tr>
<td>Percent of Households with Income Less than $10,000</td>
</tr>
<tr>
<td>Percent of Households with Income More than $200,000</td>
</tr>
<tr>
<td>Share of Employment in Goods Producing Sectors</td>
</tr>
<tr>
<td>Employment to Population Ratio</td>
</tr>
<tr>
<td>Percent of Housing Units Owner Occupied</td>
</tr>
<tr>
<td>Percent of Owner Occupied Houses Spending 35 Percent or More of Income on Housing Costs</td>
</tr>
<tr>
<td>Number of Commercial Banks per 1K Population</td>
</tr>
<tr>
<td>Share of Total Employment in the Form of Proprietorships</td>
</tr>
</tbody>
</table>

BEA-REIS, US Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System.
NORSS, USDA Forest Services, National Outdoor Recreational Statistical Information System.
BITS, US Census Bureau, Business Inventory Tracking System.
<table>
<thead>
<tr>
<th>Spatail Error Model (SEM)</th>
<th>Model A</th>
<th>Model B</th>
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<tbody>
<tr>
<td>Intercept</td>
<td>0.8937 (0.2408)</td>
<td>-1.0831 (0.1789)</td>
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<tr>
<td>Change in the Percent of the Population Foreign Born 2000 to 2010</td>
<td>0.0245 (0.8728)</td>
<td>0.0964 (0.5165)</td>
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<tr>
<td>Population Growth Rate 2000 to 2010</td>
<td>1.7052 *** (0.0001)</td>
<td>1.5545 *** (0.0001)</td>
</tr>
<tr>
<td>Percent of the Population Age Under 18 Years</td>
<td>-1.6790 (0.2912)</td>
<td>2.9971 * (0.0802)</td>
</tr>
<tr>
<td>Percent of the Population Age 65 Years and Over</td>
<td>1.8101 (0.1958)</td>
<td>1.2265 (0.3604)</td>
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<tr>
<td>Population Density</td>
<td>0.0001 ** (0.0005)</td>
<td>0.0001 ** (0.0011)</td>
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<tr>
<td>RGF Social Capital Index</td>
<td>-0.0352 (0.6326)</td>
<td>0.0205 (0.7811)</td>
</tr>
<tr>
<td>Average January Temperature</td>
<td>0.0014 (0.7838)</td>
<td>0.0081 * (0.0761)</td>
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<tr>
<td>Average July Humidity</td>
<td>0.0007 (0.8390)</td>
<td>-0.0019 (0.5281)</td>
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<tr>
<td>Unemployment Rate</td>
<td>-6.4884 ** (0.0014)</td>
<td>-6.8103 ** (0.0004)</td>
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<tr>
<td>Percent of Households with Income Less than $10,000</td>
<td>-2.3935 (0.1922)</td>
<td>0.1117 (0.9506)</td>
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<tr>
<td>Percent of Households with Income More than $200,000</td>
<td>2.6729 * (0.0767)</td>
<td>-2.7397 (0.1080)</td>
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<tr>
<td>Share of Employment in Goods Producing Sectors</td>
<td>-2.1223 ** (0.0004)</td>
<td>-1.4647 ** (0.0142)</td>
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<tr>
<td>Employment to Population Ratio</td>
<td>-1.3775 ** (0.0020)</td>
<td>-1.1585 ** (0.0063)</td>
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<tr>
<td>Percent of Housing Units Owner Occupied</td>
<td>0.6674 (0.3456)</td>
<td>1.2348 * (0.0790)</td>
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<td>Percent of Owner Occupied Houses Spending 35 Percent or More of Income on Housing Costs</td>
<td>5.9066 *** (0.0001)</td>
<td>5.3264 *** (0.0001)</td>
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<tr>
<td>Number of Commercial Banks per 1K Population</td>
<td>2.2437 *** (0.0001)</td>
<td>2.5783 *** (0.0001)</td>
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<tr>
<td>Share of Total Employment In the Form of Proprietorships</td>
<td>7.4906 *** (0.0001)</td>
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<tr>
<td>Concentration of Foreign Born Caucasian</td>
<td>20.3378 *** (0.0001)</td>
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<tr>
<td>Concentration of Foreign Born Asian</td>
<td>1.9148 (0.1843)</td>
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<tr>
<td>Concentration of Foreign Born Latino/a</td>
<td>-1.9900 ** (0.0340)</td>
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<tr>
<td>Spatial Lagged Parameter</td>
<td>0.4840 *** (0.0001)</td>
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<tr>
<td>R²</td>
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<td>0.8011</td>
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<tr>
<td>Log-likelihood</td>
<td>-255.072</td>
<td>-230.939</td>
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Table 3: Business Start-Up Rates, By Industry Classification

<table>
<thead>
<tr>
<th>Industry Type</th>
<th>Caucasian</th>
<th>Asian</th>
<th>Latino/a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>-0.0250</td>
<td>-0.1001 **</td>
<td>-0.0100 (0.7875) (0.0166) (0.7102)</td>
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<tr>
<td>Construction</td>
<td>2.1729 **</td>
<td>-1.3637 **</td>
<td>-0.5617 ** (0.0068) (0.0002) (0.0162)</td>
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<td>Manufacturing</td>
<td>0.8145 **</td>
<td>0.1477</td>
<td>-0.2107 ** (0.0013) (0.2011) (0.0040)</td>
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<tr>
<td>Professional, Scientific and Technical Services</td>
<td>3.8719 ***</td>
<td>1.2183 **</td>
<td>-0.3766 (0.0001) (0.0017) (0.1385)</td>
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<td>Retail</td>
<td>2.6131 ***</td>
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<td>Accommodation and Food Services</td>
<td>1.1114 **</td>
<td>0.1685</td>
<td>-0.2113 (0.0290) (0.4655) (0.1524)</td>
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<td>Wholesale</td>
<td>2.2379 ***</td>
<td>0.4448 **</td>
<td>0.4201 *** (0.0001) (0.0095) (0.0001)</td>
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<td>Information</td>
<td>0.8547 **</td>
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<td>Finance and Insurance</td>
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<td>Real Estate, Rental and Leasing</td>
<td>1.2443 **</td>
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<td>Administrative Support, Waste Management</td>
<td>1.4572 ***</td>
<td>-0.3953 **</td>
<td>-0.3809 ** (0.0001) (0.0213) (0.0005)</td>
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<td>Health Care Services</td>
<td>1.3059 **</td>
<td>0.5570 **</td>
<td>-0.2799 * (0.0093) (0.0140) (0.0554)</td>
</tr>
<tr>
<td>Arts, Entertainment and Recreation</td>
<td>0.2283</td>
<td>-0.2001 **</td>
<td>0.0312 (0.1663) (0.0083) (0.5095)</td>
</tr>
<tr>
<td>Other Services</td>
<td>2.8620 ***</td>
<td>-0.0016</td>
<td>-0.2515 ** (0.0001) (0.9936) (0.0435)</td>
</tr>
<tr>
<td>Educational Services</td>
<td>0.4717 **</td>
<td>0.0802</td>
<td>-0.0811 ** (0.0003) (0.1803) (0.0323)</td>
</tr>
<tr>
<td>Transportation Services</td>
<td>0.6211</td>
<td>0.3592 *</td>
<td>0.6846 *** (0.1671) (0.0775) (0.0001)</td>
</tr>
</tbody>
</table>

Marginal significance or p-values in parentheses.

***: Significant at the 99.9% level.

**: Significant at the 95.0% level.

*: Significant at the 90.0% level.