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Rural entrepreneurship and migration☆

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ABSTRACT

Using data for U.S. rural counties we examine the how the age profile of migrants from 1990 to 2000 impacts business start-ups in 2000. Depending on the industry classification, we find that younger and older migrants tend to have the largest impacts on rural business start-ups. The impacts tend to be larger for older migrants than younger. This result, which is consistent with the findings of the meta analysis of Akgün et al. (2011), has strong policy implications: from an entrepreneurial perspective, the loss of younger adults is likely out-weighed by the "retirement migration" of older persons. Rural communities should not overlook the in-migration of people who are either pre-retirement age or retirees when pursuing entrepreneurship strategies.

1. Introduction

Rural America faces a range of challenges partly stemming from limited economic assets, particularly when compared to urban areas (Cromartie, 2017). Rural areas within the U.S. tend to have lower levels of formal education, older age profiles, limited access to financial capital, and lower rates of entrepreneurship, as measured by business start-ups. In addressing the challenges facing rural economic growth and development, policies have often centered on exogenously bolstering perceived asset deficits by attracting investment from metropolitan areas. The most common example of this effort to shift resources regionally is industrial recruitment (Hubbard and Gorton, 2009; Deller, 2014; Low, 2017). While industrial recruitment has been part of rural and urban economic development strategies alike, these tactics have been especially persistent in rural areas despite mixed outcomes. The effect of industrial attraction through tax waivers and subsidies on local outcomes is debatable at best (Conroy et al., 2016, 2017; Mitchell et al., 2018). Further, recruitment strategies are confounded due to a relatively small pool of existing firms that are mobile (Conroy and Deller, 2015).

Slowly, the importance of business start-ups, often in the policy framework of entrepreneurship, has become apparent within the broader discussions of rural development policy (Markley et al., 2005; Dabson, 2007; Gruidl and Markley, 2009). Specifically, rural economic development strategies may be better directed at entrepreneurs who start and grow businesses rather than recruiting large, established businesses. Job growth can come from two sources: (1) the expansion of existing businesses and (2) the creation of new businesses. Using the Business Information Tracking System (BITS), generated by the U.S. Census Bureau, we can track job creation (Fig. 1a). From 1977 to 2014 the average annual gross job creation for rural counties from new business formation was just over 739,000 and almost 1,255,000 from existing businesses. Unfortunately, at the same time, many existing businesses are shedding jobs and even ceasing operations. If we look at net job growth from existing businesses over the same period, there is an average annual net job loss of just over 569,000 (Fig. 1b). Without the creation of jobs through new business formation, rural employment would be steadily declining.

Despite a shift toward the growing importance of entrepreneurship, the best methods for encouraging innovation, investment, and ultimately, new business creation are uncertain especially in rural areas. Arguably, people with ideas—or those with the talent, training, or education to innovate—are the impetus for new business generation. This interplay between human and social capital and entrepreneurial activity creates an innovative milieu that fosters sustainable economic growth and development within rural communities (Markeson and Deller, 2015). Some (e.g., Skuras et al., 2005; Stockdale, 2006; Kalantaridis and Bika, 2006; Kalantaridis, 2010) have argued that in-

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Fig. 1. a.Rural gross job creation. Source: Business Information Tracking System (BITS), calculations by the authors. b.Rural net job creation. Source: Business Information Tracking System (BITS), calculations by the authors.

migration is essential for rural economic development. Bringing new people into the community through the migration process can result in new resources being introduced into the community including fresh ideas, connections to broader networks outside the community and approaches to thinking about community economic development, and in particular, business development and entrepreneurship (Akgün et al., 2011; Bosworth, 2010; Bosworth and Atterton, 2012).

In this research, we consider the effect of net migration between 1990 and 2000 on startup rates in rural (defined as nonmetropolitan) counties in 2000. While this period may not fully capture more recent structural or technological changes, such as the increasingly important issue of broadband availability, we focus on the migration patterns from 1990 to 2000 because the disruptions of the Great Recession make the migration patterns of 2000–2010 unrepresentative of longer-term rural patterns. In addition to exploring the impact of overall net migration rates on total business start-up activity in 2000, we look at migration by five-year incremental age group categories starting with the net migration of ages 25 to 29 and ending with ages 75 and over. As outlined by von Reichert et al., (2014a, 2014b), many rural communities are particularly concerned about the outmigration of their youth.

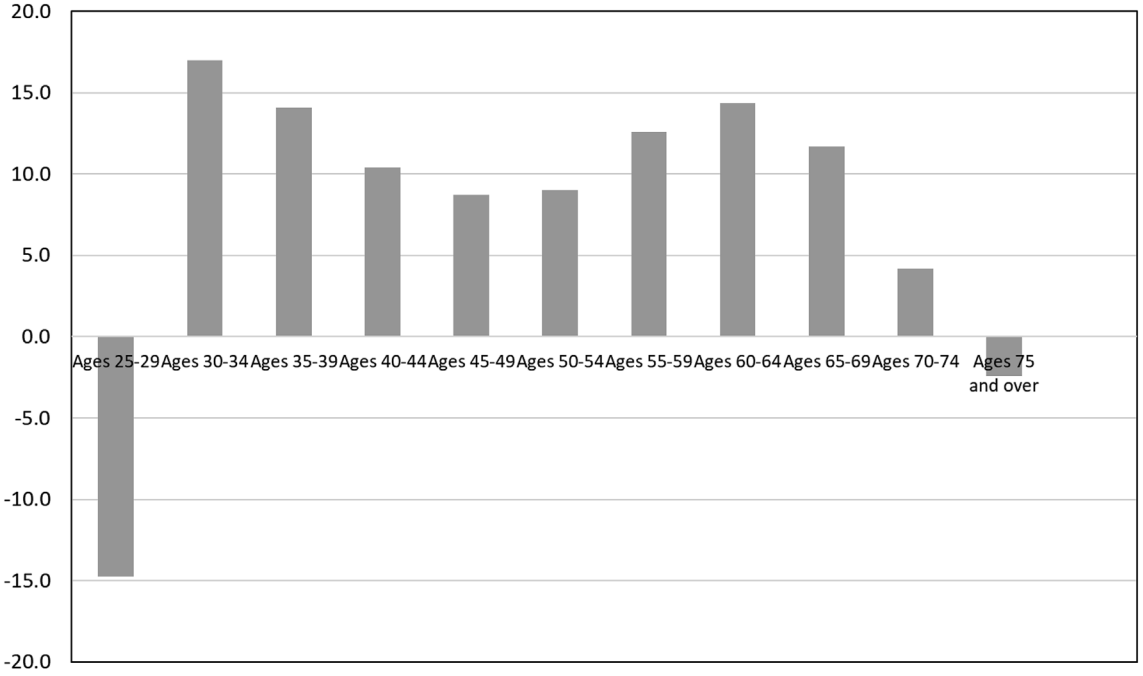

Fig. 2. Rural net migration rate per 100 individuals (1990–2000).
Source: Internal Revenue Service(IRS), calculations by the authors.

The perception is that the "youngest and brightest" are leaving rural communities for the "bright city lights" resulting in a drain on the future economic prospects of the community. While it is well established that the out-migration far exceeds in-migration of those ages 20 to 24, as many are relocating for higher education and "bright city lights", this pattern continues into the post college years of ages 25 to 29 (Fig. 2). But during the study period, other than the very oldest category 75 and over, the typical rural county experienced positive net in-migration.

This raises the question whether the positive inflow of middle-age migrants, and those who might be classified as pre-retirement and retirement age, might offset economic effects attributed to the out-migration of younger adults. As noted by Deller (1995) and Shields et al. (2001) the in-migration of older people is generally viewed as a means to inject new spending in the community. Retirees bring pension, social security and other retirement income with them which in turn is spent in the community. How pre-retirement and retirees can possibly be a source of entrepreneurial activity is less well understood and only recently receiving attention (Kautonen et al., 2017; Zhang and Acs, 2018). Accordingly, this research builds on Lambert et al. (2007) by exploring the interplay of migration patterns by age cohort and business start-ups. In addition to exploring total business start-ups we also look across different industrial sectors to gain finer policy insights.

We use two unique datasets in this analysis: Business Information Tracking System (BITS) generated by the U.S. Census Bureau and National Establishment Time Series (NETS) created by Walls and Associates in partnership Dun and Bradstreet. The difference between BITS and NETS for our purposes is the employment associated with the start-up. 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 *de novo*—starting at the outset with employees—or exist as a self-employed person long before it hires employees. NETS includes businesses with no employees and new business is included at the earliest sign of business activity. Drawing data from the Census Bureau's Statistics of U.S. Businesses (SUSB), Business Dynamics Statistics (BDS), and Business Employment Dynamics (BED) programs and the Nonemployer Statistics (NES) program one can document there were almost 30 million firms in the U.S. in 2014, but only 19.6 percent of those firms have employees beyond the owner of the firm.

This distinction is important for this study as the NETS based analysis captures significantly more businesses than the BITS based analysis. Though these data are not directly comparable, the differences suggest that our results can provide keen insights into the nature of the entrepreneurial activity of rural communities. Whereas the BITS data is allows us to look across different industry types, specifically across the two digit NAICS codes,[1] NETS allows us to better understand small, nonemployer-type businesses not included in NETS. Thus, there are two distinct levels of analysis: total business start-ups (BITS and NETS) and industry specific start-ups (BITS).

Beyond these introductory comments, the study is composed of four additional sections. First we provide a brief overview of the relevant literature to gain insights into the theoretical and empirical foundations for the interplay between migration and entrepreneurship. We then outline our empirical framework followed by a discussion of the results. We close the study by reviewing the key points with a focus on policy insights along with suggestions for additional research and policy discussions.

2. Literature review

Rural economies are often framed in terms of structural deficits arising from population loss, inadequate investment, limited levels of human capital, and aging populations. In turn, much of the dialogue on rural economic development is motivated by the need to address these weaknesses, especially in terms of economic imbalances between nonmetro (rural) and metro (urban) areas. This perceived divide between urban and rural economic assets often spurs rural communities to pursue exogenous development opportunities based on the assumption that economic growth can be driven by attracting capital from other areas. Among the most popular exogenous development strategies are industrial attraction efforts that attempt to entice firms to relocate using a variety of direct and indirect financial incentives (Hubbard and Gorton, 2009; Deller, 2014; Low, 2017).

[1] Unfortunately, we do not have the same level of detail for the NETS data.

While industrial attraction is a hallmark of economic development efforts across the rural-urban continuum, it remains particularly widespread in non-metropolitan areas. This continued prevalence is somewhat expected given that industrial recruitment has rural roots in Mississippi's Balancing Agriculture with Industry (BAWI) policies that were enacted in the 1930s. BAWI sought to diversify Mississippi's largely agricultural economy by attracting manufacturing and is often identified as the beginning of the industrial recruiting era. Indeed, the visibility of successful recruitment efforts such as Mercedes Benz in Alabama, Boeing in South Carolina, Tesla in Nevada, Foxconn in Wisconsin and Amazon to New York City and Northern Virginia just outside Washington DC, likely contributes to the continued popularity of rural industrial attraction efforts. This success has been uneven across rural regions and throughout economic cycles, particularly as rural comparative advantages in the form of lower operating costs have been undermined by globalization. In addition, the size of the incentive packages offered to these large-scale recruitment efforts is beyond the means of most, if not all, rural communities.

Despite its popularity as an economic development strategy, the overall economic contributions of industrial recruitment are highly debated. Policies that waive taxes or provide subsidies have shown to be a largely ineffective strategy for economic growth particularly in the long-term (Dewar, 1998; Gabe and Kraybill, 2002; Peters and Fisher, 2004; Lee, 2008; McGranahan et al., 2011; Bernini and Pellegrini, 2011; McCarthy, 2015). Contrary to popular opinion, firms also are relatively immobile, creating intense community competition for a small pool of prospective relocation candidates (Conroy and Deller, 2015). Furthermore, few recruitment efforts consider the counterfactual. That is, would these firm location decisions still have occurred if the recruitment efforts were not in place? Perhaps the most present challenge to the effectiveness of industrial recruitment is the emerging evidence suggesting that growth stems from business startups and young companies, rather than the relocation (or retention) of existing firms (Haltiwanger et al., 2013; Conroy and Deller, 2015).

The declining effectiveness of industrial attraction, as well as the failure of other rural development strategies, has encouraged a gradual shift to endogenous efforts that promote rural growth. Endogenous development strategies rely on leveraging local strengths, knowledge and expertise rather than depending upon external resources. These asset-based approaches are rooted in various forms of local natural, human, social and cultural capital present in a community that create a foundation for growth (Francis and Henderson, 1994; Porter et al., 2004; Emery and Flora, 2006). Indeed, the recent 11th OECD Rural Development Conference further emphasized the importance of leveraging regional assets as a means of encouraging rural economic development (OECD, 2019). This emphasis on local assets, in addition to the evidence that new and young firms spur growth, has led many researchers and policy makers to argue that entrepreneurship should be emphasized as a rural economic development strategy (Drabenstott, 2001; Dabson, 2007; Olfert and Partridge, 2010; Lyons, 2015).

Despite a growing emphasis on rural entrepreneurship, the true ability of entrepreneurial development efforts to stimulate consistent rural growth remains unclear (Rowe et al., 1999; Stockdale, 2006; McGranahan et al., 2011). This uncertainty is not surprising as implementing a new non-traditional model for local economic development can be challenging. Rural traditional economic development practitioners may not understand how to leverage, support or nurture entrepreners (Markley et al., 2005). Furthermore, political pressure, reduced visibility, and loss of funding are concerns facing organizations and elected officials that are considering a new approach (Hart, 2008).

The uncertain ability of entrepreneurship to generate widespread or consistent rural prosperity may also stem from the connections between entrepreneurship and human capital. Ahmad and Seymour (2008, p. 14) define entrepreneurs as “people who design, produce and generate value through the creation or expansion of economic activity.” Consequently, human capital is the driver of entrepreneurship, not simply geographic place or local context. Similarly, Stockdale (2006) notes that human capital is the primary source of innovation and entrepreneurial skills. That is, for entrepreneurship to work as an endogenous growth strategy, sufficient levels of human capital have to be present.

If rural areas are in fact deficient in human capital, using traditional, if flawed, measures of formal education, then entrepreneurship development in rural regions may be inherently challenging. Given the potential ties between human capital and entrepreneurial propensity, the mechanisms that introduce or remove rural human capital may also influence a region's entrepreneurial outcomes. Specifically, Stockdale (2006, p. 357) argues that “migration has the potential to introduce or remove human resources, and as such the prospects for endogenous development are inextricably linked to contemporary migration processes.” In particular, net out-migration may limit entrepreneurship as it removes human capital that could spur entrepreneurial growth while in-migration is potentially a transfusion of human capital in the forms of new ideas and enthusiasm (Stockdale, 2006; Akgün et al., 2011).

The connection between rural in-migration and entrepreneurship is also an important component of “commercial counter-urbanization.” As defined by Bosworth (2010, p. 977), commercial counter-urbanization is “the growth of rural economies stimulated by inward migration. This may take the form of business creation by rural in-migrants, their employment in other rural firms, or their promotion of other businesses through local trade, knowledge exchange and cooperative working.” Consequently, rural in-migrants may directly start new businesses, but could also spur entrepreneurial activity through other mechanisms. As the number of residents increases, they will require additional services, for example, that could draw more people into starting a business.

Alternatively, the addition of more residents can enhance the local labor pool and attract more businesses. Thus, while skilled migrants may themselves be entrepreneurial, which is plausible given that in moving they demonstrate certain risk preferences, energy level, and financial resources, it is also the case that they can support and encourage local entrepreneurs through their effect on demand and labor resources. The notable connections between rural in-migration and new business formation suggests rural entrepreneurship should not be viewed as a purely endogenous economic development strategy, but rather one that is neo-endogenous in nature. Rural migrants often have established social and economic networks in their extra-local places of origin. Upon starting a new enterprise, in-migrants are able to leverage these external sources of capital to support the development of their business. As these business owners become embedded in their new communities, they are ultimately able to bridge external and internal networks and resources (Bosworth and Atterton, 2012). Effectively, these in-migrants can become a mechanism for bridging social capital as they integrate into their new location; they can be the connection between the resources destination community and their origin community. Consequently, embeddedness, a very specific element of social capital, is a key process in commercial counter-urbanization.

Noting that rural in-migrants may be heterogeneous in their origins and motivations, Mitchell and Madden (2014) suggest that the contributions of migration to rural growth is better examined by limiting rural in-migrants to those that were adults at the time of movement, those who are business owners, and those that arrived from larger communities (i.e. “commercial counter-urbanites). In their analysis of in-migrants to rural Nova Scotia, Mitchell and Madden (2014) find that commercial counter-urbanites are indeed active components of the local business community that contribute to the territory's cultural and natural identity. These commercial counter-urbanites also create local employment opportunities, albeit at small rates.

In further assessing migration as a means of injecting human, social and financial capital to rural regions, Lambert et al. (2007) explore the connections between entrepreneurship and the migration of seniors in non-metropolitan counties. The net migration of individuals between the ages of 55 and 69 was found to have a positive association on job

and business growth in non-metro counties in the Southeastern United States. Their results found a notable amount of variability among the payoffs for rural counties, suggesting that economic development efforts focusing on the recruitment of seniors may be a better fit for some non-metropolitan counties than others. These findings are consistent with the results of a meta-analysis of twenty-two applied studies that explore how in-migrants impact rural economies through entrepreneurs. Akgün and colleagues (2011: p. 1207) find that "newcomer entrepreneurs are relatively older, better educated, and develop more non-agricultural business. They appear to be predominantly attracted by a rural lifestyle. In many cases, newcomer entrepreneurs are not directly the instigators of economic development, but their contribution to physical capital formation is greater than that of the locals."

An analysis of migration and entrepreneurial outcomes in two remote rural Scottish regions suggests less encouraging results. Stockdale (2006) found that small levels of return migration to these regions were not associated with small business creation. While in-migration did indeed contribute residents with necessary levels of different forms of capital, there was little evidence that these individuals used their abilities to start businesses. Those in-migrants that did start businesses tended to be characterized as "survival" businesses that supported the business owner's well-being rather than creating economic opportunities for others. Kalantaridis (2010) analysis of northeast England also found that in-migration in isolation is not sufficient to understand local entrepreneurial activity and that prior local conditions, what is referred to as the "opportunity nexus", are fundamental. Conditions around industrial mix, access to urban markets, existing levels of social capital, including embeddedness, and financial capital, to name a few, are almost necessary conditions for the migration and entrepreneurship interplay to be impactful.

McGranahan et al. (2011) consider the connections between rural entrepreneurship and capital less directly from the perspective of migration, but instead using measures of outdoor amenities and the so-called creative class. Counties having both high levels of the creative class and high rates of self-employment or establishments per jobs (i.e. entrepreneurial context) showed greater increases in establishments and jobs during the 1990s. Growth in the population and subsequent creative class levels in these high amenity areas is likely driven by migration. The connection between human capital, rural entrepreneurship and implied migration is an important finding, but suggests that these outcomes are not uniform across rural areas and are in fact influenced by natural capital levels in the form of natural amenities. In a unique study of firm relocations from urban to rural counties in the U.S. Rupasingha and Marré (2018) found that higher levels of natural amenities was one of the strongest predictors of such movements.

Inconsistent outcomes between rural migration, human capital and entrepreneurship levels is to be expected given the variabilities in rural character, composition or Kalantaridis (2010) notion of "opportunity nexus". While both Lambert et al. (2007) and McGranahan et al. (2011) consider some variations among rural areas, there is room for numerous additional inquiries. In particular, there are greater opportunities to explore how the migration of different age groups may influence entrepreneurial outcomes. Broadly, entrepreneurial activity tends to peak among individuals in their late thirties and early forties (Stangler and Spulber, 2013). While many other demographic characteristics can influence the probability of becoming an entrepreneur, the influence of age on entrepreneurship is particularly relevant as migration patterns in rural areas are particularly pronounced among different age groups (Smith et al., 2016). Furthermore, the analysis by Akgün et al. (2011) notes that those in-migrants who became entrepreneurs in rural areas tended to be older seeking out a particular way of life offered by rural communities.

3. Methods, data and model

We approach the question of how migration rates influence rural entrepreneurship using net migration rates from 1990 to 2000 by age group to model business startups in 2000. Our analysis proceeds in three steps. First, we estimate a set of base models with no migration variables included. Here we look at the start-up rate, measured as the number of start-ups per 1000 population. We use data from both the Business Information Tracking System (BITS) generated by the U.S. Census Bureau by linking establishments year to year in the County Business Pattern database. We also use the National Establishment Time Series (NETS) created by Walls and Associates in partnership with Dun and Bradstreet. The difference between BITS and NETS for our purposes is the employment associated with the start-up. 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 *de novo*—starting at the outset with employees—or exist as a self-employed person long before it hires employees. NETS includes businesses with no employees and new business is included at the earliest sign of business activity. Thus firms included in BITS are also included in NETS, but the number of businesses in NETS is more extensive. The difference are those new small nonemployer-type businesses.

By comparing and contrasting how migration influences start-ups across these two measures of entrepreneurship, we can explore the robustness of the results and gain more precise policy insights. Second, we also decompose total business start-ups from the BITS data into nine industry subsets following the North American Industrial Classification System (NAICS) including (1) farming, forestry and fishing, (2) manufacturing, (3) retail, (4) finance and insurance, (5) professional, scientific and technical services, (6) administrative, support and waste management, (7) arts, entertainment and recreation, (8) accommodations and food services, and finally (9) other services. This last category would include automotive repair and other repair services, barber and beauty salons, personal services, and organizations such as business or labor associations. While we do not have the industry detail for the NETS data, we can still gain insights on non-employer businesses that are absent from BITS. We decompose total start-ups into their different industry types for two reasons. First, the heterogeneity across these different industry types suggests that the underlying relationship to migration should vary by industry type. One could simply think in terms of underlying drivers of tradeable (or basic in terms of simple export base theory) and non-tradeable (or non-basic) industries. Second, from a policy perspective, if there are discernible patterns across age categories, finer insights into community level economic growth and development strategies can be identified. A complete listing of these categories and corresponding descriptive statistics is provided in Table 1a.

Third, prior research on rural entrepreneurship (e.g., Deller, 2010; Hall and Sobel, 2008; Markeson and Deller, 2012, 2015; Plummer, 2009) has found strong spatial dependency in the data. From a purely intuitive perspective, the data are reported at the county level, but the county boundaries do not necessarily coincide with the relevant economic boundaries. Thus, neighboring counties can be mutually dependent because of their spatial proximity. More important, there has been a growing understanding within the entrepreneurship literature that there are spatial clusters of entrepreneurial activity. For example, studies of Germany (Fritsch and Wyrwich, 2016) and U.S. metropolitan areas (Mack and Credit, 2016) find that there are spatial "hotspots" where levels of entrepreneurial activity are consistently higher than region wide averages.

In the case trying to understand the effects of in-migration, spatial effects may be all the more relevant. In-migration, our focal explanatory variable, has a strong spatial characteristic itself in measuring movement between two places. Further, for understanding entrepreneurship and how in-migrant may shape outcomes, the connections of in-migrants to their origin location may be important resources that will

Table 1a
Descriptive data for start-ups and migration rates.

	Average	Standard Deviation	Median	Minimum	Maximum
BITS Birth Rate per 1K Population	2.21	1.10	2.01	0.00	11.64
NETS Birth Rate per 1K Population	4.69	1.90	4.34	0.44	18.76
BITS Birth Rate: Agriculture, Forestry, Fishing & Hunting	0.04	0.08	0.00	0.00	0.85
BITS Birth Rate: Manufacturing	0.09	0.11	0.07	0.00	1.42
BITS Birth Rate: Retail Trade	0.39	0.34	0.34	0.00	10.24
BITS Birth Rate: Finance & insurance	0.16	0.20	0.13	0.00	5.17
BITS Birth Rate: Professional, scientific, & technical services	0.15	0.33	0.11	0.00	12.22
BITS Birth Rate: Administrative, Support & Waste Management	0.09	0.14	0.07	0.00	4.15
BITS Birth Rate: Arts, Entertainment & Recreation	0.04	0.08	0.00	0.00	1.29
BITS Birth Rate: Accommodation & Food Services	0.27	0.27	0.23	0.00	5.24
BITS Birth Rate: Other Services (except public administration)	0.21	0.21	0.19	0.00	5.28
Total Net Migration Rate Per 100 individuals (1990–2000)	4.06	12.21	2.17	−32.66	80.66
Ages 25-29	−14.74	31.27	−18.38	−78.84	495.22
Ages 30-34	17.01	30.98	15.16	−76.55	320.63
Ages 35-39	14.08	19.90	10.95	−55.87	200.00
Ages 40-44	10.41	15.89	7.69	−40.48	133.20
Ages 45-49	8.73	14.23	5.91	−34.62	127.85
Ages 50-54	9.02	16.08	5.56	−36.03	143.07
Ages 55-59	12.59	20.15	7.72	−36.17	175.90
Ages 60-64	14.36	22.99	8.77	−32.88	256.27
Ages 65-69	11.67	20.37	7.27	−38.87	266.27
Ages 70-74	4.20	12.46	2.44	−38.46	153.58
Ages 75 and over	−2.40	11.50	−2.37	−54.10	86.98

shape their influence in new community. Their networks, for example, could connect them to broader market, a wealth of information and experience, and inputs not to mention how other factors such as their past employment, property ownership, and access to financial resources may shape spatial relationships through in-migrants. To test for spatial dependency we use the Moran's I and Geary's c statistics: in the BITS-based measure of start-ups are 0.187 (standard deviation is 0.0033) and 0.492 (standard deviation is 0.0446), respectively, suggesting the presence of spatial dependency in the data. The NETS-based measure of start-ups also shows a statistically significant presence of spatial dependency (Moran's I is 0.217 with standard deviation of 0.0033 and Geary's c is 0.473 with standard deviation of 0.0366).

Thus, to avoid biases, inconsistencies and inefficiencies in the presence of spatial dependency we prioritize structuring these spatial relationships ahead of other econometric strategies and employ the appropriate spatial estimators (LeSage and Pace, 2009). Specifically, we treat the spatial dependency as a source of noise in the data that must be accounted for by using the spatial error model (SEM): $y = \beta X + \varepsilon$, $\varepsilon = \lambda W\varepsilon + u$, $u \sim N(0, \sigma^2)$ where W is a row-standardized spatial weights matrix. A spatial weights matrix is asymmetric N by N matrix that reflects the relative connectedness of every geographically coded observation pair based on spatial distances between the centers of each county. While the early spatial econometrics literature was rich with studies testing the sensitivity of analysis to alternative specifications of the spatial weight matrix (W) LeSage and Pace (2014) show that the exact form of the spatial weight matrix becomes secondary to a properly specified model.

The basic model can be expressed as:

$$ENT = \beta_1 HG + \beta_2 IC + \beta_3 SoC + \beta_4 EC + \beta_5 SC + \beta_6 AM + \beta_7 FC + \beta_8 DS + \varepsilon$$

with the error structure as defined above. Here HG is historical growth, IC is income characteristics, SoC is social or demographic characteristics, EC is economic characteristics, SC is social capital, AM is amenity capital, FC is access to financial capital, and DS is the incremental distance to metropolitan areas of increasing size. Most of the control variables are drawn from the relevant literature (e.g., Henderson et al., 2007; Markeson and Deller, 2012, 2015; Goetz and Rupasingha, 2014; Deller and Conroy, 2016, 2017). Specific variables include: lagged employment and income growth, median household income, share of households with income greater than $150,000, percent of the population foreign born, and ethnicity index along with an educational attainment index, the unemployment ratio and an economic diversity index, population density and percent of the population inside urban clusters to reflect the ruralness of the county, land area in both forests and lakes and average July humidity, property taxes per capita and median rent to reflect costs of living, the concentration of religious organizations, business associations and civic and social organizations to reflect social capital, the number of all bank loans and number of all financial institutions both per 1000 population to reflect access to capital. A complete listing of the control variables and corresponding descriptive statistics is provided in Table 1b.

While most of the control variables are straightforward, a few require explanation. The ethnic index is drawn from Alesina et al. (1999) which measures the probability that two randomly drawn individuals from the county belong to different ethnic groups: $Ethnic\ Index = 1 - \Sigma_i(Race_i)^2$. A higher value of the index is indicative of a more diverse population. The education index is the 3rd moment of the distribution across different levels of educational attainment where positive values of the index means that lower education attainment is more likely and negative values suggest higher educational levels are more likely. We expect higher levels of entrepreneurship, measured by startup rates, to be associated with higher educational attainment, hence a negative estimated coefficient. The economic diversity index is a simple Herfindahl index using two digit NAICS categories.[2] Smaller values of the measure suggests greater levels of diversity, whereas larger values indicate a more specialized economy. Building on Jacobian type spillovers, Audretsch and Keilbach (2004) argue that a more diverse economy creates greater opportunities for new businesses. In addition, more diversified economies provide greater opportunities to move from a failing enterprise to an alternative business. The population to employment ratio captures the degree to which the county can be characterized as an employment hub or bedroom community. We would expect that counties with lower population to employment ratios to be more entrepreneurial as there may be a greater concentration of

[2] Here the economic diversity index is computed for the ith county as: $H_i = \sum_{s=1}^{S_i} \left(\frac{e_{si}}{e_i}\right)^2$ where e_i is total employment in the county and e_{si} is the level of

Table 1b
Descriptive data for modeling control variables.

	Average	Standard Deviation	Median	Minimum	Maximum
Growth in Employment (1990) to 2000	0.16	0.17	0.14	−0.39	1.31
Growth in Per Capita Income (1990) to 2000	0.53	0.15	0.53	−0.31	1.60
Median Household Income ($000)	31.96	5.86	31.48	15.81	78.99
Share of Households with Income Greater Than $150,000	0.02	0.01	0.02	0.00	0.13
Share of Households with Social Security Income	0.33	0.05	0.33	0.07	0.54
Share of Households with Public Assistance Income	0.04	0.02	0.03	0.00	0.19
Percent of the Population Foreign Born	0.03	0.04	0.01	0.00	0.38
Ethnicity Index	0.39	0.26	0.32	0.05	1.25
Educational Index	1.41	1.93	1.30	−2.62	6.28
Unemployment Rate	0.03	0.01	0.03	0.00	0.14
Population to Employment Ratio	2.04	0.53	1.95	0.49	5.35
Economic Diversity Index	2.07	0.13	2.08	0.00	2.33
Share of Employment in Goods Producing Sectors	0.33	0.10	0.33	0.02	0.64
Population Density	0.04	0.04	0.03	0.00	0.26
Percent of Population Inside Urban Clusters	0.30	0.25	0.30	0.00	0.90
Percent of Land Area in Lakes	0.02	0.03	0.01	0.00	0.27
Percent of Land Area in Forest Coverage	0.27	0.27	0.16	0.00	0.94
Average July Humidity	54.34	14.69	58.00	14.00	80.00
Per Capita Property Taxes (1997)	764.18	580.96	647.00	85.00	6614.00
Median Contract Rent	299.59	84.39	287.00	108.00	952.00
Distance to Metro Area with Population Less Than 250,000	67.20	106.82	29.41	0.00	621.43
Distance to Metro Area with Population 250,000 to 500,000	42.97	66.41	6.77	0.00	426.36
Distance to Metro Area with Population More Than 1.5 Million	87.98	111.02	36.72	0.00	557.70
Number of Religious Organizations (Churches, etc.) per 1K Population	10.23	4.98	9.47	0.00	40.93
Number of Business Associations per 1K Population	1.14	1.34	0.82	0.00	17.15
Number of Civic and Social Organizations per 1K Population	1.64	1.89	1.21	0.00	22.83
Number of Loans (All Loans) per 1K Population	14.93	8.28	13.05	0.48	81.42
Number of All Financial Institutions per 1K Population	0.53	0.29	0.47	0.00	2.54

opportunities. We expect higher levels of social capital, as well as access to financial capital, to be linked to higher rates of business startups. The distance measures to metropolitan areas is included based on the results of Kalantaridis (2010) who finds access to urban markets an important part of the "opportunity nexus." The economic diversity index is also aimed at capturing Kalantaridis' notion of "opportunity nexus" which is consistent with Jacobian spillovers.

Beyond the base model which contains the above identified control variables, we introduce migration rates over the time-frame in a complete block and in a stepped in manner:

$$ENT = f(X,\ Mig_j) \quad j = 1,\ ...,n$$

where n is 1,2, …, 12 and X is the complete set of control variables. We step in specification because of the potential of high levels of collinearity if we include all migration age categories at once. These 1990 to 2000 net migration categories across age groups include:

Ages 25-29	Ages 40-44	Ages 55-59	Ages 70-74
Ages 30-34	Ages 45-49	Ages 60-64	Ages 75 and over
Ages 35-39	Ages 50-54	Ages 65-69	

We also look at total net migration for each age group as a starting point for discussion. The descriptive statistics for these different age categories are provided in Table 1a. In addition, the mean values across the rural counties are charted in Fig. 2. Here the out-migration of younger adults (age 25–29) is particularly clear and is a source of concern for many rural residents. The perception is that this loss reflects a brain drain from rural communities.

Note, however, the significant uptick in net in-migration of pre- or early retirement populations (age 55 and over). Returning to the work of Akgün et al. (2011), Lambert, et al. (2007), Deller (1995) and Shields et al. (2001), this "retirement migration" has a large positive impact on local economies. As noted by Kerr and Armstrong-Stassen (2011), Bruce et al. (2000), Cahill et al. (2006) and Quinn and Kozy (1996), rates of self-employment increase dramatically for those aged 50 and over. The research suggests that many people in their 50s and early 60s are looking for second careers or a different challenge in their life. For many this involves relocating from urban to rural settings with the idea of becoming an entrepreneur (Akgün et al., 2011). Through this study we aim to shed additional light on this question.

4. Results

We discuss our results in two sets: first, the insights in rural entrepreneurship gained from the base model are outlined, then second we turn to the focal point of interest on the impact of net-migration. We do find some evidence of multicollinearity, particularly if we include all age categories at once, thus justifying, at least on a statistical basis, the step in approach that we adopt. We also explore alternative specifications of the base model to reduce collinearity, but we find that the core results are stable over various specifications.

4.1. Base model results

Before turning to the key migration variables that are of the core interest of this study, consider first the results of the base models (Table 2). The base model explains 60.85 percent of the variation in start-ups from the BITS data and 60.36 percent with the NETS data. We also find that the spatial error parameter is statistically significant for both models reaffirming the results of the Moran's I and Geary's c statistics for spatial dependency. We also find a marked level of consistency in the results of the base control variables across the BITS and NETS models. These three observations in tandem suggest that the models are largely robust.[3]

The data suggest that lagged employment growth has a positive

[3] As part of the robustness checks we also estimated a spatial lag and spatial Durbin specifications of the spatial dependency and found that the results across all three spatial estimators are largely consistent. Given the consistency of results over various specifications of the base model couple with the consistency across alternative spatial specification we are confident with the robustness of our results.

Table 2
Base model results for all business start-ups.

	BITS	NETS
Growth in Employment (1990) to 2000	0.3002 **	1.2057 ***
	(0.0089)	(0.0001)
Growth in Per Capita Income (1990) to 2000	0.1254	0.3656
	(0.2923)	(0.1014)
Median Household Income ($000)	−0.0306 ***	−0.0428 ***
	(0.0001)	(0.0001)
Share of Households with Income Greater Than $150,000	22.2743 ***	24.3358 ***
	(0.0001)	(0.0001)
Share of Households with Social Security Income	−0.8730 **	3.1639 ***
	(0.0139)	(0.0001)
Share of Households with Public Assistance Income	0.7058	−4.5176 **
	(0.5421)	(0.0382)
Percent of the Population Foreign Born	−0.6553	−1.1385
	(0.2617)	(0.3012)
Ethnicity Index	−0.2969 **	−0.1953
	(0.0009)	(0.2880)
Educational Index	−0.0494 ***	−0.0688 **
	(0.0001)	(0.0021)
Unemployment Rate	−5.2225 **	−1.8148
	(0.0006)	(0.5211)
Population to Employment Ratio	−0.2620 ***	−0.4176 ***
	(0.0001)	(0.0001)
Economic Diversity Index	1.2428 ***	1.6890 ***
	(0.0001)	(0.0001)
Share of Employment in Goods Producing Sectors	−0.3775 *	0.7978 **
	(0.0570)	(0.0290)
Population Density	−3.6755 ***	−3.8292 **
	(0.0001)	(0.0016)
Percent of Population Inside Urban Clusters	−0.2485 **	−0.0609
	(0.0041)	(0.7139)
Percent of Land Area in Lakes	−1.5768 **	−0.5779
	(0.0165)	(0.6284)
Percent of Land Area in Forest Coverage	0.1168	0.0267
	(0.2589)	(0.8977)
Average July Humidity	−0.0097 ***	−0.0277 ***
	(0.0001)	(0.0001)
Per Capita Property Taxes (1997)	0.0001 ***	0.0005 ***
	(0.0001)	(0.0001)
Median Contract Rent	0.0036 ***	0.0068 ***
	(0.0001)	(0.0001)
Distance to Metro Area with Population Less Than 250,000	−0.0002	0.0005
	(0.4640)	(0.2534)
Distance to Metro Area with Population 250,000 to 500,000	0.0002	0.0006
	(0.4997)	(0.3631)
Distance to Metro Area with Population More Than 1.5 Million	−0.0001	−0.0001
	(0.8030)	(0.9596)
Number of Religious Organizations (Churches, etc.) per 1K Population	0.0127 **	0.0164 **
	(0.0029)	(0.0311)
Number of Business Associations per 1K Population	0.0611 ***	0.0300
	(0.0001)	(0.1946)
Number of Civic and Social Organizations per 1K Population	0.0312 **	−0.0373 **
	(0.0015)	(0.0325)
Number of Loans (All Loans) per 1K Population	0.0331 ***	0.0431 ***
	(0.0001)	(0.0001)
Number of All Financial Institutions per 1K Population	0.4404 ***	0.2893 **
	(0.0001)	(0.0351)
Spatial Lag Parameter	0.2380 ***	0.4420 ***
	(0.0001)	(0.0001)
R2	0.6085	0.6036

Number in parantheses is the marginal significance level or p-value.
***: Significant at the 99.9% level.
**: Significant at the 95.0% level.
*: Significant at the 90.0% level.

impact on start-up rates, but growth in per capita income does not play a significant role. Somewhat surprisingly higher median household income corresponds to lower start-up activity, but at the same time a larger share of households that are high income has a positive impact. This suggests that a distribution of income with a larger share of relatively high-income households is more important that overall income levels in explaining rural entrepreneurship rates. A larger share of households with social security income has a negative impact on the start-up of employer businesses (BITS) but a positive impact on all business start-ups when including non-employer establishments (NETS). This is one of the few control variables that have opposite effects across the BITS and NETS measures. It may be the case that those with social security income, which is not exclusive to, but does includes retirees, may have "side-line" businesses. This hints to the observation about retirees starting small businesses with no formal employees. The share of households with public assistance income does not influence BITS measured entrepreneurship, but has a negative impact on NETS measured start-ups. This may be complementing the share of higher income household results and could also weakly imply that public assistance reduces the impetus for "reactionary or necessity entrepreneurs" born out of a position with few economic opportunities.

We also find that less diverse communities, in terms of racial profiles, tend to have higher start-up rates for those businesses with at least one employee (BITS), but not all businesses (NETS). As expected, we find that rural counties whose formal educational attainment is skewed toward higher levels of education (a negative Educational Index) have higher start-up rates. A higher unemployment rate corresponds to a lower start-up rate. While sustained periods of high unemployment tend to be associated with higher levels of necessity entrepreneurship, our results suggest that high unemployment may reflect weak demand for new businesses. Further, our simple annual measure of unemployment rates does not capture persistent unemployment, which is more consistent with necessity entrepreneurship, nor do we explore how unemployment and necessity entrepreneurship may be driven by low levels of human capital.

As expected, a higher population to employment ratio is linked to lower rates of start-ups. This supports the idea that counties that are bedroom communities, as opposed to employment hubs, are less likely to have higher start-up rates, all else held constant. This result could also reflect the prior notion that in-migration alone is sufficient to spur higher start-up rates and that in-migrants need to become embedded in their new local economies to achieve a larger impact (Bosworth, 2010). Rural counties that have higher population densities, or share of the population living inside urban clusters (areas/places with a population of at least 2500) have lower start-up rates which is somewhat unexpected. Despite being a rural county, one would expect higher population densities, particularly those that are spatially clustered, would lead to modest agglomeration effects which in turn fosters entrepreneurship. But these three measures, population to employment, population density, and urban clusters, are all population focused as opposed to employment focused. Population, then may not be the key metric, but rather employment and business densities.

The economic structure of the county does help understand rural rates of entrepreneurship. Places with higher values of the economic diversity index, which are associated with more specialized economies, tend to have higher start-up rates. This result is largely inconsistent with existing literature, but that literature tends to focus on or include larger urban areas that may be driving the results. From this result, however, we cannot infer if this is evidence of Jacobian spillovers or agglomeration effects within the specialized industries or market forces moving the rural economy toward diversity. This result does suggest that some of the insights gained from urban focused studies may not apply to rural areas.[4] The higher the share of employment in the goods producing sectors (e.g., farming, mining, construction and manufacturing), the lower the rate of employer startups (BITS), but the higher the rate of all start-ups (NETS). While the employer establishment results are weak statistically, this is one of the few instances

[4] For a more detailed discussion of how the role of agglomeration economies lay out differently across rural and urban areas see the recent work by Artz et al. (2016) and Rupasingha and Marré (2018).

where the control variables have contradictory results across BITS and NETS measures of start-ups.

Two of the three amenity variables do play a role in understanding rural entrepreneurship. Rural counties that have a larger percent of land area covered in lakes tend to have lower rates of entrepreneurship while forest coverage appears to not play any particular role. Rural counties that have numerous lakes could be linked to seasonal housing and temporary residents, which in turn may explain this result. Research on recreational housing suggests that the economic impacts of such types of tourism may be surprisingly limited (e.g., Winkler et al., 2015). Outside of the construction industry, recreational homeowners tend to spend very little money in the local economy. But, in the long run, an increasing number of these recreational homes are being converted into year-round residents to which the owners retire. The data also suggests that high-humidity summers are associated with lower levels of entrepreneurship, perhaps because footloose entrepreneurs can move to preferable climates. This would lead to the relatively low rural entrepreneurship rates in states such as Alabama, Louisiana, and Mississippi.

Our two cost of living measures, per capita property taxes and median contract rent, have a positive, as opposed to the hypothesized negative, effect on start-ups. Median rent, rather than a measure of cost of living, capturing an amenity effect in rural areas which could increase rents as well as attract entrepreneurs. Higher per capita property taxes are generally viewed as an indicator of a poor business climate, hence should have a negative impact on start-ups. The data for rural U.S. counties do not support this line of thinking, but is rather more consistent with contemporary thinking (e.g., Conroy et al., 2016, 2017; Stallmann and Deller, 2011). Specifically, as income increases, the demand for quality public services increases and more entrepreneurial communities are willing to pay higher taxes to support those services. In the case of entrepreneurship, home equity is one plausible means to finance a new venture. Thus, to the extent that property taxes are correlated with valuable homes and owners' equity, we could expect a positive effect on startup rates.

The three social capital metrics tend to have the expected impact on business start-ups. Higher concentrations of religious, business, and civic and social organizations all have a positive impact on employer establishment start-up rates as measured by the BITS data. The results for the more inclusive NETS data is more mixed. Higher concentrations of religious organizations are linked to higher start-up rates, but business associations have no influence. Civic and social organizations correspond to lower startup rates. This latter result on civic and social organizations is not consistent with prior research on social capital and entrepreneurship (e.g., Markeson and Deller, 2015), perhaps because the majority of new establishment in the NETS database are without employees. These self-employed business owners may be characteristically different from owners of employer businesses in that they rely less on business services and interact less with their home communities. The two measures of access to financial capital both have the positive relationship to start-ups as expected. Finally, the distance measures to metro areas of different sizes have mixed results and generally are unimportant, suggesting that Kalantaridis (2010) conclusion that rural communities are dependent their interface with urban markets might be too strong of a statement.

Given the large differences in the types of firm start-ups across the NETS (all businesses) and BITS (employer businesses only) the largely consist results for the bulk of the control variables is somewhat pleasantly surprising. Given that NETS captures so many more firms we expected greater differences but the consistency in the results of the control variables lends a certain level of credibility to the results. Where there are notable differences some insights can be gained. For example, a higher share of goods producing employment has a negative effect on employer business start-ups but a positive effects on all start-ups. This could possibly be explained by those starting businesses in the trades, such as in construction and might be a self-employed carpenter, plumber or electrician. The result on the concentration of business associations also makes intuitive sense; businesses with employees are more likely to benefit from networking opportunities presented by business associations than those that are self-employed with no other employees.

Table 3
Net migration impacts on total rural business start-ups.

	BITS	NETS
Total Net Migration Rate Per 100 individuals	0.0143 ***	0.0206 ***
	(0.0001)	(0.0001)
Net Migration Rate: Ages 25-29	0.0043 ***	0.0031 **
	(0.0001)	(0.0155)
Net Migration Rate: Ages 30-34	0.0038 ***	0.0076 ***
	(0.0001)	(0.0001)
Net Migration Rate: Ages 35-39	0.0025 **	0.0083 ***
	(0.0264)	(0.0001)
Net Migration Rate: Ages 40-44	0.0068 ***	0.0151 ***
	(0.0001)	(0.0001)
Net Migration Rate: Ages 45-49	0.0074 ***	0.0151 ***
	(0.0001)	(0.0001)
Net Migration Rate: Ages 50-54	0.0100 ***	0.0207 ***
	(0.0001)	(0.0001)
Net Migration Rate: Ages 55-59	0.0086 ***	0.0143 ***
	(0.0001)	(0.0001)
Net Migration Rate: Ages 60-64	0.0069 ***	0.0101 ***
	(0.0001)	(0.0001)
Net Migration Rate: Ages 65-69	0.0062 ***	0.0102 ***
	(0.0001)	(0.0001)
Net Migration Rate: Ages 70-74	0.0062 ***	0.0102 ***
	(0.0001)	(0.0001)
Net Migration Rate: Ages 75 and over	0.0012	0.0042
	(0.4806)	(0.1608)

Number in parantheses is the marginal significance level or p-value.
For SAR and SDM models total effects are reported.
***: Significant at the 99.9% level.
**: Significant at the 95.0% level.
*: Significant at the 90.0% level.

4.2. Migration results

The migration results for total business start-up rates is provided in Table 3 and illustrated in Fig. 4. First and foremost, net migration rates have a strong positive impact on business start-ups whether one is considering employer establishments (BITS) or the more inclusive NETS based measure for the analysis. Notice, however, that based on the size of the relative coefficients, net migration has a consistently larger impact on the number of start-ups using the NETS data compared to the BITS data. This result makes sense because NETS includes both employer and non-employer businesses whereas BITS contains only employer businesses. Perhaps the most interesting pattern across age categories is the relatively modest impacts of migration for those under age 40 and stronger impacts of those that are in the pre-retirement and even those that are considered in retirement age. This set of results, which is consistent with the findings of the meta-analysis of Akgün et al. (2011), has strong policy implications: from an entrepreneurial perspective the loss of younger adults is likely out-weighted by the "retirement migration" of older persons.

The limitation to the analysis presented in Table 3 and Fig. 2 is that insights into the types of start-ups being created is lost. We repeat the analysis looking at start-ups by nine different industry types (Table 1a and Fig. 3). Because the start-up rates are modest for agriculture, forestry, fishing and hunting, manufacturing and art, entertainment and recreation services we expect migration patterns to have modest impacts on those types of businesses. We describe the summary results for each of these as provided in Table 4. To keep the discussion of the results focused, we do not discuss how the control variables vary by industry type and suppress them from the table.

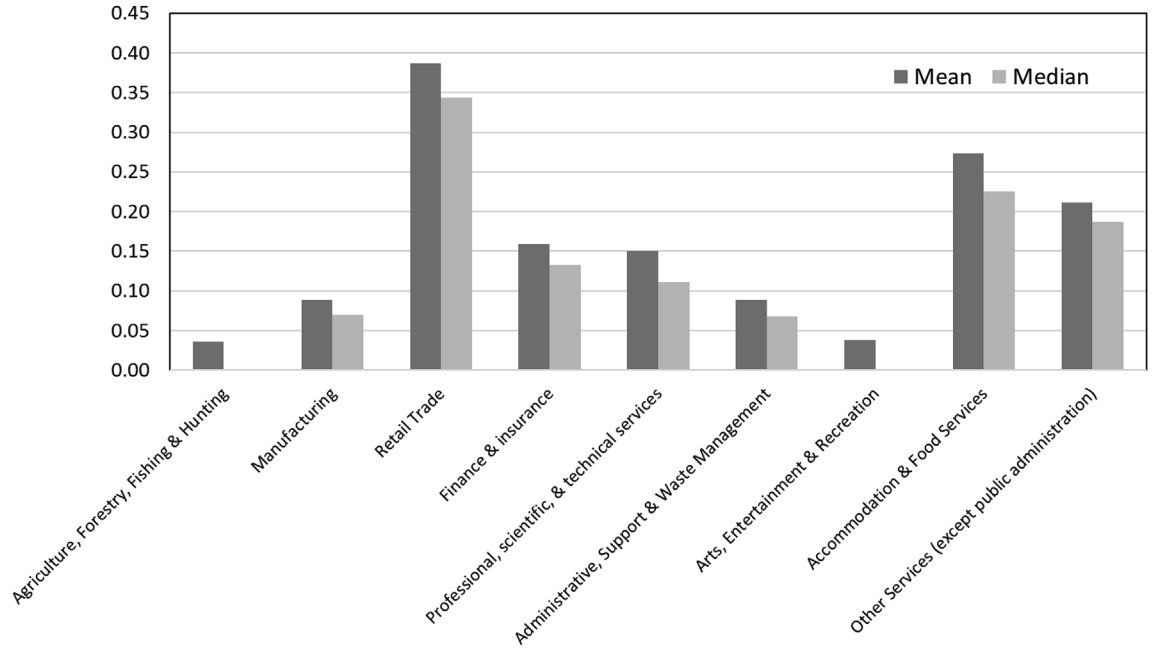

Fig. 3. Rural business start-up rate (BITS, 2000).
Source: Business Information Tracking System (BITS), calculations by the authors.

For farming, forestry, fishing and hunting, only one category of migration by age has a consistently statistically significant relationship: those ages 25 to 29, which corresponds to less start-up activity. Because of the small number of these types of businesses are reflected in the BITS data, these results are not unexpected. For manufacturing start-ups, we find that nearly every age category, even for the age category age 70 to 75, the result is positive. Given the relatively modest rate of manufacturing start-ups, this consistently significant positive result may be driven by labor supply in that large-scale manufacturing benefits from a large pool of near-by workers. For retail start-ups, there is a positive effect for almost every age category. Even positive net migration of the oldest age category has a positive influence on retail business start-ups. Accordingly, this result may not be exclusively driven by entrepreneurial in-migrants. Instead, population increase attributed to in-migrants may result in a growing demand for local services and retail shopping, thus creating opportunities for local retail entrepreneurs.

For finance and insurance start-ups, only the two categories covering those in their 30s are weakly associated with higher start-up rates. One could conclude that net migration rates do not really influence the start-ups of finance and insurance companies in rural counties. The same could be concluded for professional, scientific and technical services; net migration rates do not appear to influence the start-up rates of businesses in this industrial classification. For administrative, support and waste management and remediation services, the data suggest that the migration of younger persons (ages 25–29 and 30–34) and those in pre- or post-retirement ages (ages 55 and over) has a positive impact on

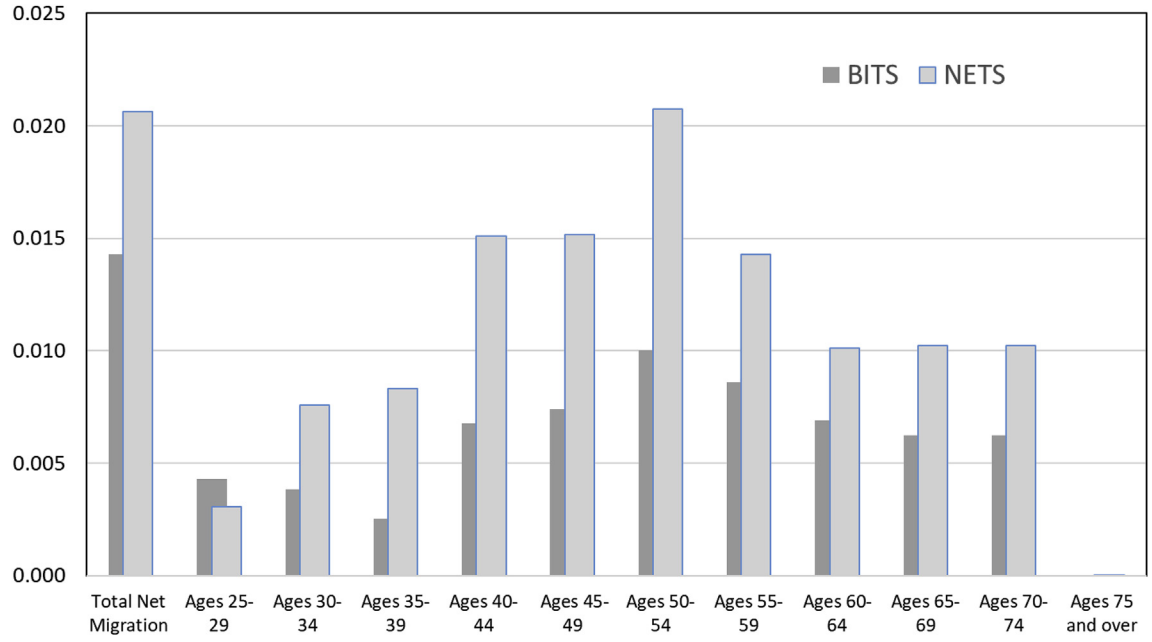

Fig. 4. Rural Net migration Impact on Start-Ups.

Table 4
Net Migration Rate Per 100 individuals.

	Farm, Forestry and Fishery,	Manufacturing	Retail	Finance and insurance	Professional, Scientific & Technical Services	Administrative, Support & Waste Management	Arts, Entertainment & Recreation	Accommodations and Food Services	Other services
Net Migration Rate: Ages 25-29	−0.0002 **	0.0001	0.0007 **	−0.0001	0.0003	0.0004 **	0.0003 **	0.0010 ***	0.0001
	(0.0077)	(0.4816)	(0.0204)	(0.7831)	(0.3344)	(0.0051)	(0.0005)	(0.0001)	(0.5252)
Net Migration Rate: Ages 30-34	−0.0001	0.0003 **	0.0011 **	0.0004 **	0.0004	0.0003 **	0.0001	0.0006 **	0.0002
	(0.2914)	(0.0048)	(0.0008)	(0.0488)	(0.2530)	(0.0419)	(0.4621)	(0.0070)	(0.3859)
Net Migration Rate: Ages 35-39	−0.0002 *	0.0006 **	0.0007	0.0006 *	0.0003	0.0002	0.0005 ***	0.0012 **	0.0003
	(0.0878)	(0.0003)	(0.2008)	(0.0729)	(0.5120)	(0.3553)	(0.0001)	(0.0030)	(0.3609)
Net Migration Rate: Ages 40-44	0.0001	0.0004 *	0.0012 *	0.0004	0.0005	0.0001	0.0001	0.0017 **	0.0003
	(0.7037)	(0.0854)	(0.0903)	(0.2953)	(0.4214)	(0.7778)	(0.5204)	(0.0007)	(0.5380)
Net Migration Rate: Ages 45-49	−0.0001	0.0004	0.0009	−0.0002	0.0004	0.0002	0.0003	0.0015 **	0.0007
	(0.9176)	(0.1436)	(0.2465)	(0.7410)	(0.5809)	(0.4366)	(0.1469)	(0.0122)	(0.1761)
Net Migration Rate: Ages 50-54	0.0001	0.0007 **	0.0019 **	−0.0003	0.0002	0.0003	0.0001	0.0021 ***	0.0005
	(0.6278)	(0.0043)	(0.0087)	(0.4947)	(0.8070)	(0.2878)	(0.6790)	(0.0001)	(0.3037)
Net Migration Rate: Ages 55-59	−0.0001	0.0010 ***	0.0016 **	0.0001	0.0004	0.0004 *	0.0001	0.0015 **	0.0009 **
	(0.3039)	(0.0001)	(0.0066)	(0.6892)	(0.4323)	(0.0702)	(0.8652)	(0.0004)	(0.0176)
Net Migration Rate: Ages 60-64	−0.0001	0.0005 **	0.0010 *	−0.0001	0.0002	0.0004 *	−0.0001	0.0008 **	0.0009 **
	(0.7195)	(0.0020)	(0.0558)	(0.7853)	(0.6786)	(0.0578)	(0.5216)	(0.0269)	(0.0060)
Net Migration Rate: Ages 65-69	−0.0001	0.0004 **	0.0013 **	0.0001	0.0007	0.0006 **	−0.0001	0.0005	0.0011 **
	(0.7739)	(0.0188)	(0.0187)	(0.6560)	(0.1671)	(0.0047)	(0.6108)	(0.2307)	(0.0007)
Net Migration Rate: Ages 70-74	−0.0001	0.0004 **	0.0013 **	0.0001	0.0007	0.0006 **	−0.0001	0.0005	0.0011 **
	(0.7738)	(0.0188)	(0.0187)	(0.6560)	(0.1671)	(0.0047)	(0.6108)	(0.2307)	(0.0007)
Net Migration Rate: Ages 75 and over	0.0001	0.0003	0.0007	0.0001	0.0004	0.0008 **	−0.0001	−0.0003	0.0005
	(0.9027)	(0.1904)	(0.3691)	(0.9221)	(0.5976)	(0.0059)	(0.4794)	(0.5856)	(0.3305)

Number in parantheses is the marginal significance level or p-value.
***: Significant at the 99.9% level.
**: Significant at the 95.0% level.
*: Significant at the 90.0% level.

the start-up rates of these types of businesses.

The two tourism related categories, specifically arts, entertainment and recreation related businesses and accommodation and food services present two very different sets of results. For the former, only two age categories (25–29 and 35–39) have a positive impact, all other age categories do not appear to play an important role. Business owners in these tourism-related industries may benefit from their own youth to the extent that tourism jobs may be physically demanding and/or require intense hours during peak seasons. For accommodations and food services, each age category up to and including those 60–64, has a positive influence in start-ups, perhaps because pre-retirement age groups are more inclined to dine out or have visitors. For the final business classification considered, other services, which includes many personal services, younger and middle age migrants do not appear to matter, but those in the pre-retirement and retirement age have a positive impact on start-ups. Consulting services and part-time care positions, as examples, may be especially appealing to older age groups that are quite skilled but want to work remotely or part-time, thus leading to more entrepreneurial activity among older populations in these categories. Again, this result points to the importance of older migrants in understanding rural entrepreneurship rates.

While we can draw policy insights and outline hypotheses about these results, we cannot definitively state that those that are migrating are those that are starting the businesses that we model. Several studies, however, have identified the desire of some early retirees to pursue self-employment as a means of generating additional income or remaining active in their communities (Akgün et al., 2011; Singh and DeNoble, 2003; Kautonen et al., 2014). Accordingly, it is likely that some migrants of this age are indeed starting businesses. Our model, however, does not allow us to draw an explicit link between start-ups and retirement age migrants (or migrants of any age). Rather, we can conclude that increasingly dynamic rural communities need to focus on entrepreneurship and that pre-retirement and retired migrants present a unique opportunity for these communities who are often overlooked in favor of younger migrants. Older migrants bring financial resources and accumulated experiences that uniquely position them to be successful entrepreneurs.

5. Conclusion

As rural communities begin to focus on endogenous or neo-endogenous economic development strategies, the importance of local asset accumulation is critical. Rural communities looking to enhance their community capital accumulation are well served by strategies that leverage net in-migration of older, experienced workers with entrepreneurial inclinations. Indeed, our results suggest that rural entrepreneurship increases with the net in-migration of across nearly all age groups but especially those between the ages 50 and 74.

Going forward, there are many potential avenues for better understanding the relationship between migration and entrepreneurship. There are a number of mechanisms that may explain why migration has a generally positive effect on entrepreneurship. While we focus on human capital of people moving into rural areas, a supply side factor that enhances the pool of potential entrepreneurs, it could also be that an influx of migrants, particularly older migrants who may have accumulated some wealth, encourage entrepreneurship through an increase in demand. Migrants may also be characteristically different from resident populations in important ways, such as risk preferences. Furthermore, in-migrants may also be able to better recognize entrepreneurial opportunities in a rural community given their ability to view the community as an “outsider” with different perspectives that arise from their individual levels of human and social capital. Effectively, there may be parallels between the preferences and characteristics of migrants and entrepreneurs that may make an individual more likely to be both a migrant and an entrepreneur.

As this analysis considers the period between 1990 and 2000, it does not fully consider the emergence of the digital economy that coincides with the rise of broadband availability. Accordingly, it would be interesting to consider how the diffusion of high-speed Internet into rural areas may affect start-up rates with regards to migration. In particular, several industries that are highly dependent on information and communication technologies, such as finance and insurance and professional, scientific and technical services, were not influenced by migration rates during the 1990 to 2000 study period. It is possible that more recent rates perhaps be influenced by rural broadband availability that may either induce additional in-migration or allow for the development of start-ups that may have been hampered by the lack of appropriate Internet infrastructure. Unfortunately, appropriately addressing this question will likely require further development of rural broadband services as just 63.1% of nonmetropolitan areas had high speed Internet service in 2013 (Fil and Ryan, 2014).

While the potential links between entrepreneurship and migration are important and we demonstrate that the relationship varies by age group. There is a growing literature focused on older migrants, and in particular retirees—their geographic mobility, consumption behavior, and labor market activities. Focusing explicitly on pre-retirement and retirement-age populations and their desire to enter self-employment after formal retirement is one potential path for future research. Boomerang migration is another alternative, focusing on those people who leave the rural communities where they were raised and return in their 30 and 40s to raise their families. These populations may move back with ideas to create employment for themselves or be pushed to self-employment by the lack of job availability. Though this study is not a rigorous test of any such mechanisms or a specific cohort, it does expose a potentially rich topic area for thinking deeper about entrepreneurship strategies and opportunities in rural areas. Most importantly, the results suggest that the migration patterns of older persons may play a more import role in understanding rural entrepreneurship than the migration of younger persons.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jrurstud.2019.01.026.

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