Location, Location, Location: Place-Specific Human Capital, Rural Firm Entry and Firm Survival

Introduction

A majority of economic development programs in the U.S. are aimed at creating jobs; and a growing subset of the funds are allocated to achieving that objective by attracting and creating new firms[1]. According to a recent Kauffman Foundation report, young firms (those less than 5 years old) account for the vast majority of net new job creation in the U.S. (Wiens and Jackson, 2014). But the empirical reality is that one-third of new start-ups fail within two years of opening and two-thirds exit by their sixth year . The exit rates in table 1 illustrate another common finding demonstrated by Yu *et al* (2011): that rural firms exit at slower rates than urban firms.

Table 1: Proportion of rural and urban firms exiting within 2 and 6 years

	Iowa		North Carolina		United States
Exit within….	urban	rural	urban	rural	All
2 years	35%	30%	37%	34%	32%
6 years	61%	55%	65%	61%	55%

[1] A 2012 New York Times articles estimates that local governments spend $80.4 billion in business incentives each year, while state and federal sources contribute $170 billion.

Sources: Authors' computations from Walls and Associates, *National Establishment Time-Series (NETS)* data for Iowa and North Carolina for business starting up between 1992 and 2008, and from the U.S. Bureau of Labor Statistics (BLS) *Business Employment Dynamics (BED)*for business starting up between 1994 and 2012.

We illustrate the patterns of urban and rural firm entry and exit using data from North Carolina and Iowa. These states were selected because they had large shares of the population that were rural,[2] but still had substantial populations in urban and metropolitan areas as well.[3] Consequently, the data span the full range of markets in the United States from the least densely populated to the most dense. We expect that our findings would generalize to comparably dense markets, but certifying that conjecture will require compiling comparable information on the universe of firms in the other 48 states.

Whether economic development policies succeed or fail depends on what factors influence firm entry decisions and how these factors contribute to the success or failure of new ventures. To these questions, we add a third: how does the impact of these factors vary across more and less densely populated markets?

In this paper, we review the literature on rural firm entry and survival and summarize key findings from our own recent work on this topic. While some have argued that rural entrepreneurship tends to be necessity entrepreneurship[4], our research suggests that the location choices of entrepreneurs are tied to an unobservable match between the entrepreneur and the location of the venture that enhances firm productivity and increases survival in both rural and urban places. We conjecture that entrepreneurs have location- or place–specific human capital. This specific knowledge could include knowledge of local productive resources, local social ties that can facilitate financing, or networks to attract and retain skilled labor or to attract and retain customers. While this location-specific human capital affects firm entry, it also plays a role in firm exit and succession. In denser urban markets, the likelihood of finding a potential successor with the requisite location-specific skill is high, and the range of possible alternative uses for the firm's assets in the area are large. As such, the firm's assets are more general in an urban setting. In contrast, the probability of finding another entrepreneur with the same location-specific skill set to purchase the firm in a thin, rural market is low, and there are fewer alternative uses for the assets in the market. As a result, rural firms face a type of asset fixity problem. Rural entrepreneurs may continue to operate their businesses longer than they wish to because they cannot find a successor. Or rural firms may continue to operate even as market conditions lower profitability because the low salvage value of their assets makes exiting a less attractive option.

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[2] Iowa ranks 12th (36% of the population) in the fraction of the population residing in rural areas, while North Carolina ranks 15th (34% of the population). Iowa production is weighted more toward agriculture and manufacturing and less to professional and business services compared to the U.S. average. North Carolina is also more heavily engaged in manufacturing than is the U.S. as a whole.

[3] North Carolina has major metropolitan areas including Charlotte (2.2 million); Virginia Beach (1.7 million) and Raleigh Durham (1.1 million). Iowa includes Omaha-Council Bluffs (855 thousand) and Des Moines (570,000). Both states have numerous smaller urban areas as well, providing us the full range of market densities.

[4] Markley and Low (2012) define necessity entrepreneurship as "individuals starting businesses because they have no other economic alternatives." If job opportunities are more limited in rural areas, more individuals may resort to necessity entrepreneurship to earn a living.

The importance of location-specific human capital in rural firm entry and survival has policy implications for rural business development policy. On the one hand, it suggests that place-based economic development policies aiming to encourage new start-ups should target individuals with the relevant types of location-specific knowledge. "Grow your own" entrepreneurship programs involving rural youth are one example. On the other hand, it also suggests a need for rural business transition efforts to retain and perhaps grow existing viable rural businesses that lack a suitable successor.

Location-specific human capital and rural firm entry

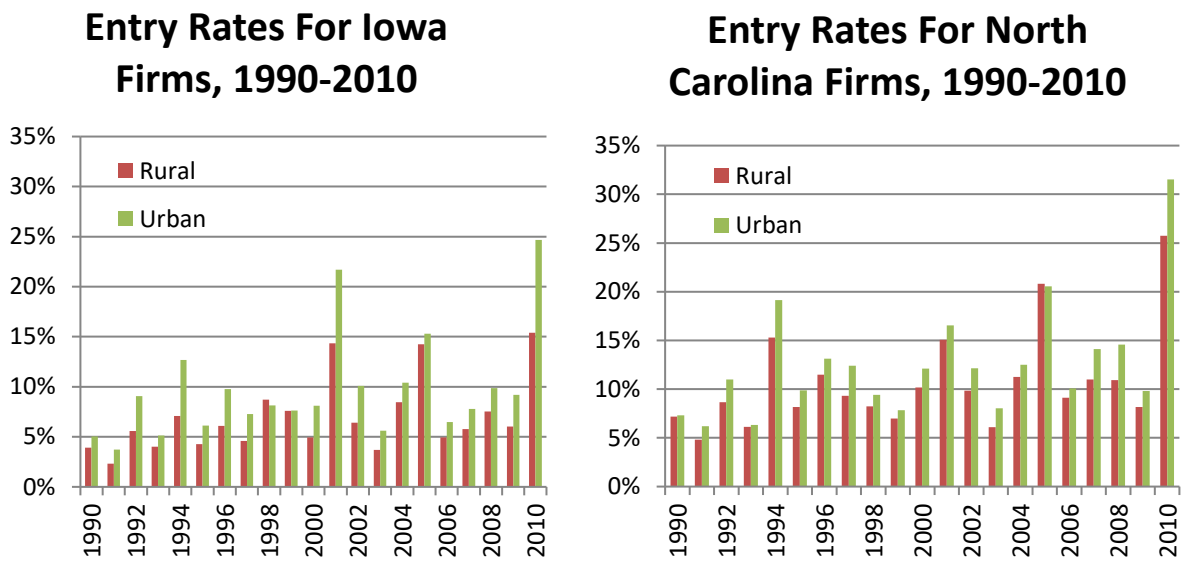
In rural areas, low population density and remoteness limit local demand and make it difficult to access educated labor, sufficient capital and infrastructure (Reynolds, *et al*, 1995). Rural areas, by definition, lack agglomeration economies. These productive externalities are associated with a ready access to high concentrations of skilled workers, local clusters of firms producing similar products or using similar production processes, or close proximity to suppliers and customers, factors commonly cited as reasons for the growth of cities (Jofre-Monseny *et al*., 2011; Ellison *et al*., 2010; Shapiro, 2006; Moretti, 2004; Porter, 2003; Feldman and Audretch, 1999; Glaeser *et al*., 1992)[5]. Firm entry rates are higher in urban than rural areas in part because agglomeration economies provide productivity or advantages that can outweigh the lower land and labor costs available at rural sites.

Consequently, in rural areas, new firm (and therefore new job) creation occurs at a lower rate than in urban areas. Figure 1 plots the annual new firm entry rates[6] for Iowa and North Carolina by rural and urban location between 1990 and 2010. Rural entry rates are consistently lower than those in urban areas in both states. On average over this time period, the entry rate in rural Iowa was 6.5% compared to 9.7% for urban Iowa. In North Carolina, the average entry rate in rural areas was 10.7% compared to 12.6% in urban areas of the state.

[5] See Arauzo-Carod, J., D. Liviano-Solis and M. Manjón-Antolín (2010) for a comprehensive review of firm location empirical studies.

[6] Entry rates are calculated as the number of new firms divided by the number of existing firms. A simple difference in means test (t-test) of rural versus urban entry rates shows that entry rates are significantly lower in rural than urban regions. The t-statistic is -5.45.

Figure 1. Firm Entry Rates, Iowa and North Carolina, 1990-2010.



While entry rates are lower, firms do enter rural areas. How well do these market factors predict rural firm entry? Using data from Iowa and North Carolina between 2000 and 2002, Artz, Kim and Orazem (2015) show that the same market factors that matter for firm entry in urban areas matter in rural areas as well. We find similar results for predicting location choices of firms over the longer time period from 1990 to 2010; market attributes have significant effects on location choice. Having a presence of incumbent firms in the same four-digit industry in the county attracts new entrants. Having more upstream suppliers to and downstream customers of the sector in close proximity adds to the attractiveness of a local market, although these effects are much smaller when we include population in the estimation. Locations with higher concentrations of college-educated workers and a more diversified (i.e., less concentrated) economy are more promising hosts for start-ups. And consistent with the data in figure 1, conditional on these other measures, firms are less likely to enter rural counties.

Market attributes matter for firm location choices, but they explain only a small proportion of the variation in location choices across firms. A measure of this is given by the difference between the *ex ante* probability of choosing the location the firm actually enters and the actual *ex post* probability which equals 1. We developed a measure of *ex ante* probability that a firm would pick a county relative to the other possible county choices in the same state and same year using a conditional logit model where local market attributes were used to predict location choice. Because each firm is choosing 1 from 99 Iowa counties or 100 North Carolina county options and the attributes of the entrepreneur and the venture are common across all the possible locations, the estimation controls for venture-specific and entrepreneur-specific fixed effects. The variables we use to control for local market factors include the number of firms in the same 4-digit industry classification in the county (*Sector Cluster*); the fraction of all input suppliers (*Upstream supply*) or output consumers (*Downstream buyers*) to the firm's sector that are located in the county; the fraction of the county population with a college degree (*College Graduate%*); a measure of industry concentration using a Herfindahl index computed from the sum of squared employment shares of 4-digit industry sectors (*Concentration*); and county median household income and county population. Factors that improve the business climate should invite additional entry. We report the estimated elasticities of the probability of firm entry with respect to these factors in table 2. All of the coefficients upon which these elasticities were based were statistically significant. The findings indicate that across both states and for both urban and rural markets, firms enter markets more readily when population is larger, per capita incomes are higher, there are already some firms in the same sector in the market, there is a high concentration of educated workers, and there is a diverse industrial base. Entry is only modestly encouraged by upstream suppliers and downstream buyers.

But while these observable factors have plausible impacts on firm entry, it is the unobservable factors that drive location choice. The difference between the actual and predicted probability is greater than 0.9, meaning that observable market factors explain less than 10% of the firm entry decision.

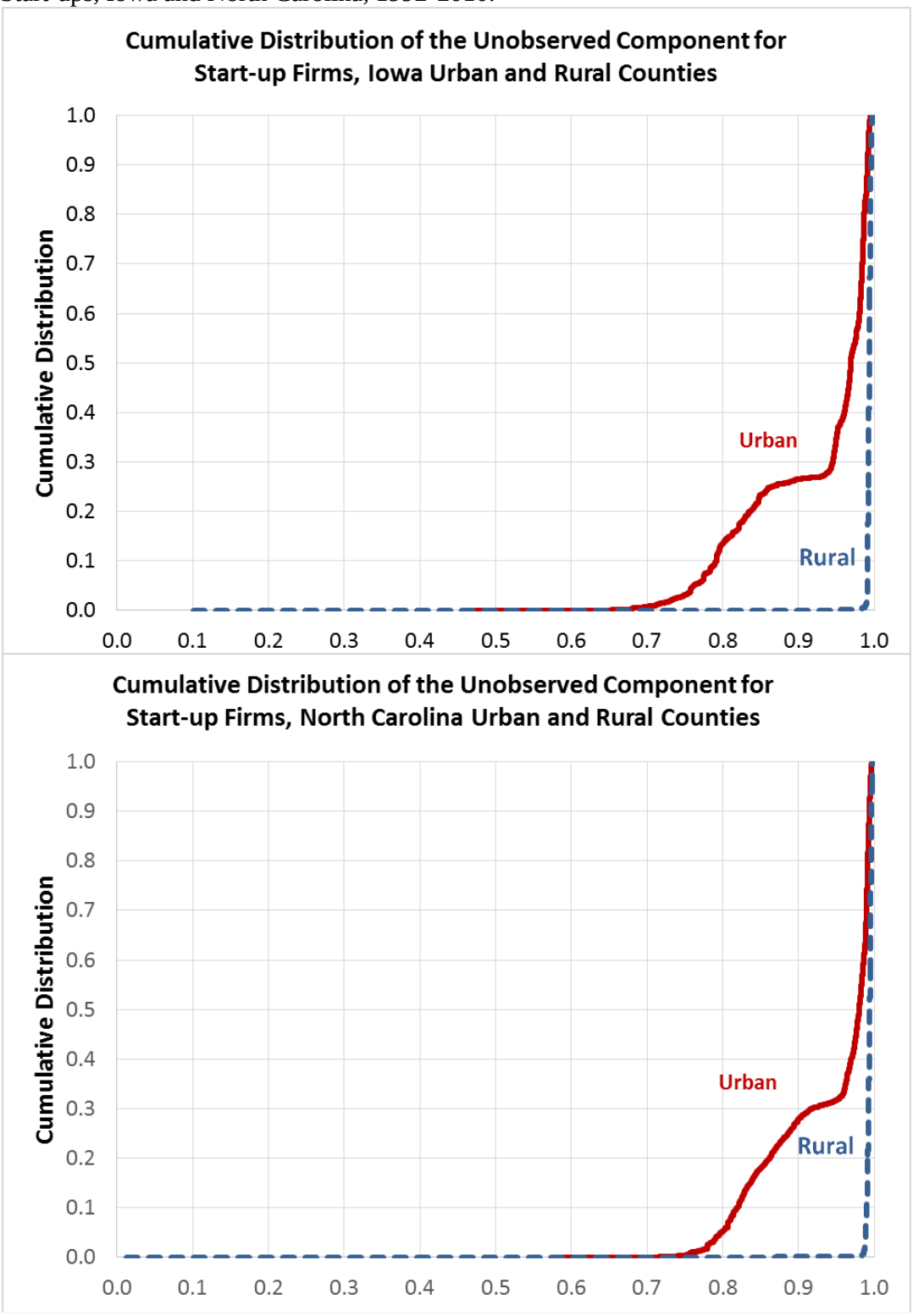
Table 2. Elasticities of county attributes on probability of new firm entry in North Carolina and Iowa, 1991 - 2011

	Iowa		North Carolina	
County attributes	Urban	Rural	Urban	Rural
Sector Cluster	0.360	0.206	0.299	0.300
Upstream supply	0.062	0.004	0.001	<0.001
Downstream buyers	0.037	0.002	0.065	0.004
College Graduate%	0.666	0.488	2.163	1.584
Concentration	-0.222	-0.237	-0.089	-0.097
Median Household Income	1.049	0.851	0.130	0.095
Population	1.180	0.095	1.140	0.134

All elasticities computed from coefficients from a conditional logit estimation of firm decisions to enter one of 199 possible counties across the two states. All coefficients were statistically significant at standard levels.

Market factors explain even less of the choice in rural than urban areas. This is demonstrated in Figure 2 which plots the cumulative distribution of these differences between *ex post* and *ex ante* probability of choosing the location for rural and urban firms in Iowa and North Carolina. Because the rural cumulative distribution (CDF) lies to the right of the urban CDF, we can conclude that the unobserved component is more important in rural than in urban markets.

Figure 2: Estimated Unexplained Component of the Location Decision for Urban and Rural Start-ups, Iowa and North Carolina, 1992-2010.



We treat the difference between the e*x post* and *ex ante* probability of choosing the location as a measure of location-specific skills and factors that influence the decision to pick that particular location beyond the observed locational attributes. Given that agglomeration measures and other observable location characteristics such as tax rates, government expenditures and natural amenities explain only a small fraction of the location choices of new firms, what else might predict firm location choices, particularly in rural areas? We conjecture that location-specific human capital matters for firm entry. Entrepreneurs tend to be local. Michelacci and Silva (2007) document that a significantly higher fraction entrepreneurs work in the region where they were born relative to the corresponding fraction of workers. In a survey of Iowa State University alumni focused on entrepreneurship after college, we find that 45 percent of rural born entrepreneurs started their businesses in a rural location. Rural entrepreneurs were more likely than urban entrepreneurs to locate their ventures in their home county. Specifically, 37% of rural businesses were started in the rural entrepreneur's home county compared to 19% of urban businesses (Artz and Yu, 2011). Findings from other studies lend support to the importance of proximity to home for firm location choices. For example, Figueiredo, Guimarães and Woodward (2002) explain roughly 20 percent of variation in location choices of manufacturing firms in Portgual when they include only agglomeration measures. Adding an indicator of whether the location choice of the entrepreneur is the investor's "home base" explains an additional 42 percent of the variation. They estimate that an entrepreneur is willing to pay more than three times the labor costs to remain in his home area.

These unobserved location-specific factors that influence entry could just be a matter of the personal tastes of the entrepreneur that do not affect firm profitability.[7] On the other hand, if they do affect firm profitability, they may affect all firms in the location equally or they may be tied to the individual entrepreneur. For example, strong social ties may facilitate financing a start-up venture locally, help an entrepreneur attract and retain skilled labor and may lead to increased community support for the business once opened (Onyx and Bullen, 2000; Besser and Miller, 2013). Michelacci and Silva (2007) find firms created by local entrepreneurs are bigger, more capital-intensive and better funded than firms created by non-local entrepreneurs, and conjecture that locals are better positioned to exploit the financial opportunities available in the region. An entrepreneur's location-specific human capital may be knowledge of opportunities in particular local markets or information about the resources that can be exploited in the area that lowers the costs of production for the potential new firm in that area relative to other possible markets (Kirzner 1997). It could also reflect individuals' investments in learning certain skills pertinent to the industries in the place in which they reside (Krupka 2009)[8].

[7] This concept of specific local knowledge is akin to a concept from the migration literature, location specific human capital, which represents the idea that some returns to human capital are location –specific. People make investments in their place of residence that increase the costs of migration. The accumulation of location-specific skill at a prior residence is positively associated with the probability of return migration (DaVanzo, 1988; Dierx, 1988).

[8] A broader notion allows that people develop human capital that is specific to a type of place, as opposed to any one particular place (Herzog and Schlottmann, 1982; Artz, 2006; Krupka, 2009).

We investigate these questions in our dataset of Iowa and North Carolina entrants. First, we analyze the effect of the unobserved component, what we view as the match between the entrepreneur and the location, on firm survival. If the unobserved component is uncorrelated with firm survival (and by extension firm profitability) it suggests that the choice of place is more a matter of the entrepreneur's taste for location. But if the unobserved match component is measuring a productive factor, it will be positively correlated with firm survival. We find the elasticity of firm survival probability with respect to the location match component is 0.65 in Iowa and 0.44 in North Carolina, consistent with our presumption that these unobserved location-specific components represent a productive match between the entrepreneur and the location. This is true, even after we control for firm size and whether the firm is part of a multi-establishment firm.

Second, we examine the variation in the unobserved component across counties for rural and urban locations. If the variation can be explained largely by county fixed effects, it indicates that the unobserved component of firm location choice is tied to the place, but is common across firms and therefore could be transferred to a potential business successor. If, in contrast, the variation is not well explained by county fixed effects, the unobserved component is tied to the idiosyncratic match between the entrepreneur and the location, the individual entrepreneur's location specific human capital. In this case, it is not common across all firms, but is specific to the individual firm/entrepreneur. Table 3 presents the results.

Table 3: Variance decomposition of the idiosyncratic match into between (location-specific) and within (entrepreneur-location match) components

	Iowa		North Carolina	
Variance due to	Urban	Rural	Urban	Rural
Between (county fixed effects):	0.90	0.04	0.93	0.10
Within:	0.10	0.96	0.07	0.90
Total	1.0	1.0	1.0	1.0

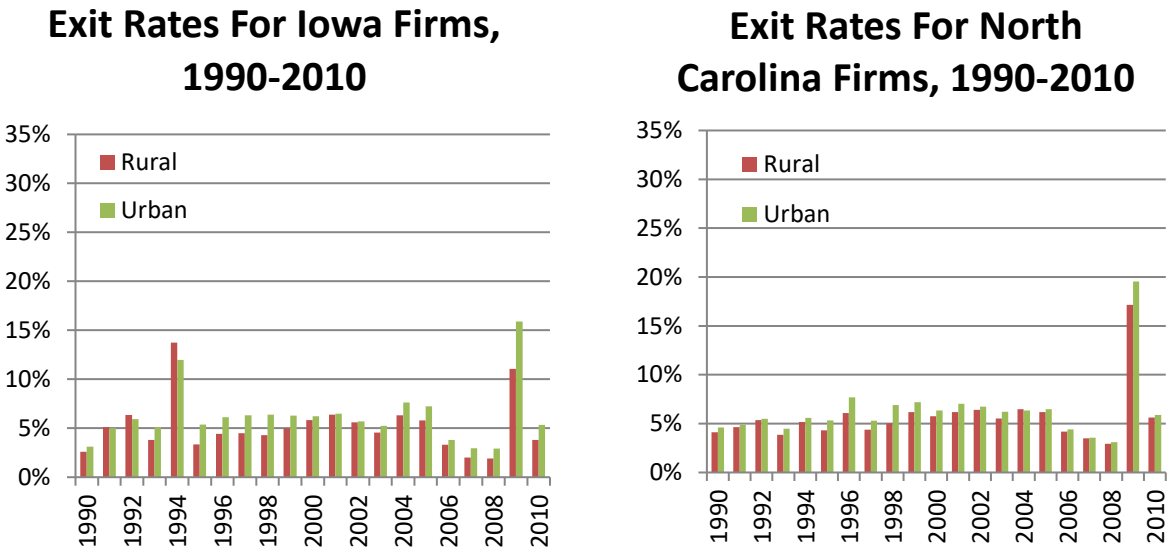
Over 90 percent of the variation in the urban match is explained by the county-fixed factors in urban markets, but in rural areas, over 90 percent is tied to the match between the location and the entrepreneur.

Location-specific human capital and rural firm exit

While rural entry rates are lower than urban entry rates, it is also the case that rural exit rates are lower than urban exit rates. Figure 3 plots the annual new firm exit rates[9] for Iowa and North Carolina by rural and urban location between 1990 and 2010. Rural exit rates are consistently lower than those in urban areas in both states. On average firms exited rural areas of Iowa at a rate of 5.2% over the 20 years period, while the exit rate for urban Iowa was 6.2%.

[9] Exit rates are computed as the number of firms exiting in a year divided by the existing number of firms. A simple difference in means test (t-test) of rural versus urban exit rates shows that exit rates are significantly lower in rural than urban regions. The t-statistic is -3.67.

Figure 3. Firm Exit Rates, Iowa and North Carolina, 1990-2010



The corresponding averages for North Carolina were 5.7% for rural regions and 6.3% for urban regions. This is consistent with the empirical evidence that rural firms live as long, or longer, than urban firms (Buss and Lin, 1990; Huiban, 2011; Yu, Orazem and Jolly, 2011). Yu, Orazem and Jolly find that the rural comparative survival advantage remains even after they control for firm, location and industry attributes that affect survival and local conditions at the time of entry. Huiban (2011) reports similar findings in a study of French firms. In his data, 43 percent of rural firms survived 8 years, while only 25 percent of firms in the Paris region were still operating in year 8. One explanation for this rural comparative survival advantage is that the market for the capital of failed firms is weaker in rural than in urban markets (Yu *et al*, 2011). This lowers the firm's anticipated salvage value in a rural location at the time of entry relative to the salvage value a comparable capital investment would have in an urban location. The lower value conditional on failure for rural firms means that rural firms must have a higher expected probability of survival at the time of entry to justify the rural start-up.

As noted above, the unobserved location-specific component behaves like an unobserved entrepreneurial skill in that it increases the likelihood of firm survival. Because these location-specific components are more important for rural than urban firms, they imply a higher probability of rural firm survival, holding observed profit factors constant. That is why we find that in both North Carolina and Iowa, urban firms have a shorter expected length of life at time of entry than observationally equivalent rural firms.

Is longer survival necessarily a good thing? It is natural to think of longer surviving firms as a good thing; firms that stay in business longer are presumably profitable enough to keep operating. Firms that exit, however, are often considered failures. But there are various types of "exit": bankruptcy, closure due to retirement or to pursue a different, more profitable opportunity and sale of the business. An entrepreneur's decision to exit is a function of the difference between the expected present value of profit from operating the business and the potential sell-off or salvage value of the firm (Huiban, 2011). A higher salvage value increases the likelihood of a "successful closure"(Wennberg and DiTeinne, 2014; DiTienne, 2010). The importance of location-specific human capital in business location choice, and business survival, has implications for exit as well. Our finding that the unobserved match component is tied primarily to the place in urban markets may reflect unobserved location specific profitability common across all firms in the sector. It may also be related to the density of the market. In urban markets, there is a ready supply of potential successors who have the similar location-specific knowledge needed to successfully operate the business. Hence, successful urban firms may have many suitors seeking to purchase them, and a higher probability of a successful closure. In contrast, successful rural firms will face a thin supply of potential successors. Similar to Lazear's (2009) skill-weights approach to human capital in which thicker markets make all skills general, the greater supply of potential successors in urban markets renders the firms' assets more general, and increases their sell-off value. In rural areas, there are fewer potential entrepreneurs making the assets more specific[10].

The extent to which the idiosyncratic components of firm location choice are tied to specific entrepreneurs defines the degree of asset specificity. While this location-specific knowledge may be productive, if it is unique to the entrepreneur and location, as appears to be the case in rural areas, it will be difficult to transfer the firm to another entrepreneur and will reduce the firm's salvage value. This is a variation on the asset fixity problem in agriculture (Johnson, 1956) or the spatial fixity problem that results from remoteness (Ward and Hite, 1999).

The asset fixity problem can not only limit business succession in rural areas, it can also limit the movement of capital. Wiens and Jackson (2014) note: "Many young firms exhibit an "up or out" dynamic, in which innovative and successful firms grow rapidly and become a wellspring of job and economic growth, or quickly fail and exit the market, allowing capital to be put to more productive uses." But if asset fixity exists, it is difficult to transfer assets to another location or another use. Because of this, rural firms may continue to operate even as market conditions lower profitability because the low salvage value of their assets (due to lack of available buyers) makes exit the less attractive option.

Conclusions and Policy implications

Firm location choice is driven more by unobserved idiosyncratic factors than market

[10] Even productive assets that are tradable can become more or less specific if the market is very thin. Foltz (2004) provides the example of dairy cows in Connecticut: because there are so few other dairies in the region, a farmer who wanted to exit might be forced to sell his dairy herd as cull cows rather than productive assets.

factors in both rural and urban markets, but it is the predominant driver of choice in rural locations. We believe that rural raised individuals are more likely to start rural business because they possess location-specific human capital that makes rural entrepreneurship a productive option. The importance of location-specific human capital in rural areas supports "grow your own" business development approaches for rural areas. These economic development models focus on developing local resources that support local businesses and entrepreneurs rather than directing resources outside of the community (Federal Reserve Bank of Kansas City, 2015). Future research into the nature of the match between entrepreneurs and locations could be fruitful. Identifying and interviewing entrepreneurs with atypically large unobserved idiosyncratic factors could help identify common attributes that characterize these unusually successful rural start-ups and whether those attributes can be taught or acquired by future rural entrepreneurs.

This research also has implications for firm exit and transition. We find that a main impediment for business transition is the ability to find a successor with the requisite location-specific skill set to take over the business. Family members are the most obvious successors. Children or other family members of rural entrepreneurs can acquire the social capital, resources and specific knowledge of how to run the firm profitably (Westhead, 2003). Yet, the grown children of rural family-owned operations often have established careers and little interest in succeeding their parents in running a "small-town" business. In the United States, about 30 percent of family businesses are transferred to second generation family ownership and only 13 percent survive to 3rd generation (Battisti & Okamuro, 2010).

An alternative to family succession is transfer to an employee of the business (or a group of employees). Transition to employee-ownership retains the firm-specific human capital embodied in the firm's workforce and may increase the probability that the business will continue to exist in its current location, benefitting both the employees themselves and the local community (Dickstein, 1991; Reynolds 2009). Furthermore, in the U.S., selling to employees provides a tax benefit to the owners (the Internal Revenue Code Section 1042 rollover).

Absent a family or employee heir, finding a successor may be facilitated through matching programs such as AgLink. AgLink is designed to match retiring farmers who do not have an heir to continue the family farm business, with beginning farmers who do not own land. A similar program for non-farm rural businesses, coupled with an apprenticeship program that would give the successor time to build skills and equity in the business would be an additional way to address the thin markets problem for rural businesses.

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