Toward Integration of a Semantic Framework With a Commercial PLM System

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A growing subset of economic development programs in the United States are aimed at attracting or creating new firms.\(^1\) Firms less than five years old account for the vast majority of net new job creation in the United States. However, new firms are fragile: one-third of new start-ups fail within two years of opening and two-thirds exit by their sixth year (Table 1). To succeed, economic development strategies must increase the pace of firm entry without altering the likelihood of failure. Designing such policies requires information on what factors contribute to the success or failure of new ventures, and how those factors vary across locations.

Our research suggests that the location choices of entrepreneurs are tied to the match between the entrepreneur and the location. A good match enhances firm productivity and increases firm survival in both rural and urban markets. We conjecture that the most successful entrepreneurs have some knowledge specific to their location, whether it is information on resources that can be exploited in a local area or local industry, ties to local sources of financing a start-up venture, or social networks that help attract and retain skilled labor or customers. We call this place-specific human capital. While this location-specific capital affects firm entry, it also plays a role in firm success and the value of the firm at the time of exit and succession.

Because most ventures fail, part of the expected value of the start-up is the value of the enterprise were it to be sold. If location-specific knowledge matters for success, the value at time of sale will depend on whether there are other potential buyers who share that knowledge. In denser urban markets, the likelihood of finding a potential successor with the requisite place-specific knowledge is high, and so there are many potential successors who could be as productive in the location. In rural markets, the opposite is true. As a result, rural entrepreneurs may continue to operate their businesses even if the realized profit stream is disappointing because they cannot find a successor willing to pay a sufficient amount to make the transition to a new owner attractive. In urban markets, even successful ventures may be sold for yet more promising ventures.

The importance of location-specific 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. 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.

Figure 1 shows the annual new firm entry rates for Iowa and North Carolina by rural and urban location between 1990 and 2010.\(^2\) Rural entry rates are consistently lower than those in urban areas in both states—6.5 percent and 10.7 percent, for rural areas in Iowa and North Carolina, respectively, and 9.7 percent and 12.6 percent for urban areas in Iowa and North Carolina, respectively.

Data from Iowa and North Carolina, show that the same market factors that matter for firm entry in urban areas matter in rural areas as well. Both urban and rural start-ups are attracted to markets that already have some firms.
in the same industry have better access to suppliers or customers, have higher concentrations of college-educated workers or higher income families, and have a diversified mix of local firms. In addition to these common market factors that raise firm profitability, our study measures the added value of place-specific knowledge in enhancing the profitability of firm entry.

We found that the entrepreneur’s decision to enter a specific location was heavily influenced by place-specific knowledge and that the amount of place-specific knowledge significantly increased the likelihood of firm survival. Place-specific knowledge was even more important for the entry decision and survival of rural entrepreneurs.3

As shown in Table 1 the lower firm exit rates in rural markets are consistent with a presumption that the place-specific human capital is more important for the success of rural entrepreneurs than urban entrepreneurs.

However, it is also consistent with the presumption that there are more potential successors to an urban firm than a rural firm. Few potential buyers of the rural firm means a low salvage value of the rural firm compared to a comparable capital investment in an urban location. This implies that firms that enter rural markets must have a higher expectation of success at the time of entry in order to compensate for these lower salvage values if the venture fails.

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 are often considered failures; however, there are various types of exit: bankruptcy, closure due to retirement or to pursue a different 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, with higher salvage value increasing the likelihood of a “successful closure.” The importance of place-specific human capital in business location choice, and business survival, has implications for exit as well. In urban markets, there is a ready supply of potential successors who have the same, or at least adequately similar, place-specific knowledge needed to successfully operate the business. In contrast, rural entrepreneurs may have a unique skill set that is atypically complementary with that location, and so when they are no longer operating the firm, the profitability of the successor at the location would be reduced.

Many long-running rural firms have faced problems finding successors. Family members are the most obvious successors, 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 the third generation.

An alternative to family succession is transfer to an employee 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. Absent a family or employee heir, finding a successor may be facilitated through matching programs such as AgLink, which matches 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.

<table>
<thead>
<tr>
<th>Exit within….</th>
<th>Iowa Urban</th>
<th>Iowa Rural</th>
<th>North Carolina Urban</th>
<th>North Carolina Rural</th>
<th>United States All</th>
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<tr>
<td>2 years</td>
<td>35%</td>
<td>30%</td>
<td>37%</td>
<td>34%</td>
<td>32%</td>
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<tr>
<td>6 years</td>
<td>61%</td>
<td>55%</td>
<td>65%</td>
<td>61%</td>
<td>55%</td>
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1A 2012 New York Times article estimates that local governments spend $80.4 billion in business incentives each year, while state and federal sources contribute $170 billion.

2Entry rates are calculated as the number of new firms divided by the number of existing firms. Similarly, exit rates are computed as the number of firms exiting in a year divided by the existing number of firms.

3This is consistent with the findings from a survey of Iowa State University alumni entrepreneurs that found that 37 percent of rural entrepreneurs started their businesses in their home county compared to only 19 percent of urban entrepreneurs. Presumably, place-specific human capital would be greatest in the location where an individual was raised.