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**Explaining Self-Employment Success and Failure:  
Wal-Mart vs. Starbucks, or Schumpeter vs. Putnam\***

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## Abstract

*Objectives.* Two powerful socioeconomic innovations are sweeping the nation, led by Wal-Mart, Inc. and Starbucks Corp. These innovations both affect and are driven by profound labor market changes, but exactly how they affect self-employment or entrepreneurship has not been investigated. We examine the independent effects of these phenomena on the returns to self-employment, which is itself an under-researched topic in labor economics. *Methods.* We apply spatial econometric analysis to data from over 3,000 US counties to analyze how big-boxes and drinking places that facilitate social networking, affect self-employment earnings. *Findings.* The presence of Wal-Mart stores is associated with higher returns to self-employment, whereas the results for coffee shops and drinking places are mixed. A negative interaction effect on earnings emerges when Wal-Mart stores and drinking places exist in the same county. *Conclusions.* We confirm both Schumpeter's and Putnam's assertions about the importance of creative destruction and social networking in raising the productivity of entrepreneurs, although the latter effect is not as clear-cut as the former.

## **Introduction**

One of the most important but least-recognized labor market trends of the last 35 years has been the tripling of the number of proprietorships or self-employed workers, to 32.9 million in 2006. This growth is believed to reflect downsizing in large firms associated with off-shoring and the tremendous opportunities created by information technology for small, single-proprietor firms. Despite its growing importance, however, non-farm self-employment remains poorly understood. Self-employed proprietors are usually not enumerated at the state-level, where only those covered by unemployment insurance are considered to be part of the workforce.

In tandem with surging self-employment, two powerful socioeconomic forces are spreading across the United States. One is the big-box phenomenon, led by Wal-Mart Stores Inc., which in the process of revolutionizing the retail industry has become the largest private employer in some states. The other is the coffee shop phenomenon, represented most prominently by the Starbucks chain, which advertises itself as providing a “third” place between home and work (Oldenburg, 1999). In earlier related research the social drinking that occurs in alcoholic beverage bars has been shown to be associated with higher incomes (e.g., Bray, 2005; Hamilton and Hamilton, 1997). One explanation is that the social drinking enables networking, and Starbucks or coffee shops similarly provide a place for business networking opportunities that in turn enhance the productivity of the business owners.

While Wal-Mart has been the subject of an exploding body of academic studies (e.g., Basker, 2005; Dube et al. 2005, Hicks, 2005; Irwin and Clary, 2006; Fitzgerald and Wirtz, 2008), systematic research on the effects of coffee shops on different socioeconomic variables is generally lacking. Furthermore, there has been surprisingly little if any research on the factors that account for variation in the returns to self-employment across the US counties. Yet these impor-

tant trends may be interrelated. First, Wal-Mart tends to drive local “mom-and-pop stores” out of business, at least in the short-run, and these stores often are owned by self-employed workers.<sup>1</sup> To the extent that the marginal businesses are driven out first, it is likely that those that remain are more profitable. Second, the new generation of self-employed workers is less bound by rigid schedules or place of work rules (e.g., Pink, 2001).<sup>2</sup> These individuals use coffee shops and related venues to conduct business and to network socially, and this at least partially explains the success of the Starbucks chain.

According to Schumpeter (1911) the destruction wrought by new companies such as Wal-Mart raises productivity and returns to self-employment over the long-run by stimulating competition (see also Sobel and Dean 2007). According to Putnam (2000), productivity also rises in the presence of venues or facilities that encourage social networking (for more on networks, see Watts 2003). This study investigates formally and systematically whether the presence in a community of Wal-Mart stores and establishments that facilitate informal social networking, such as Starbucks and alcoholic beverage bars, influence self-employment success or failure, measured here as the returns to self-employment. The next section presents a concise literature review.

### **Understanding Self-Employment or Entrepreneurship**

Progress has recently been made in understanding the origins of entrepreneurial or self-employment behavior (e.g., Acs et al. 2008; Baumol 2006; Schramm 2006; Goetz and Freshwater 2001), building on Schumpeter’s (1911) model of creative destruction. Agents seek out and exploit new market opportunities with an unrelenting drive to “do things better,” occasionally spawning entire new industries and in the process creating wealth and economic progress.

Awareness is also growing that the propensity towards self-employment and the returns to such endeavors vary significantly over space. Yet the reasons for this spatial variation remain poorly understood. In this study we link local, county-level structural conditions to varying returns to entrepreneurship or self-employment. The results provide new insights into what communities can and cannot do to stimulate successful local entrepreneurial activity in the form of self-employment.

Economists have in the past tended to treat the entrepreneurial process as a black box, partly because entrepreneurship is difficult to quantify and model. Baumol (2006) explains that the heterogeneity of entrepreneurship pushes it out of the reach of quantitative analysis: "... an invention yesterday is mere repetition today" (p. 2). Further, entrepreneurship is about disequilibrium, and thus cannot be treated within "... a stationary Walrasian model, even in a more sophisticated variant" (*ibid.*). Phelps (2006, p.8), in contrast, sketches an equilibrium model of entrepreneurial actions and "the entrepreneurial economy as an interactive system." Researchers studying entrepreneurial endeavors have focused on individual rent-seeking behavior and generally not considered community-wide factors. Or, they have examined entrepreneurship as collective action following Olson (1971), whereby benefits are received through group action (e.g., Cook and Plunkett 2006). The growing interest in clusters spawned by Porter (1998, Ch. 7) suggests a new avenue for inquiry that considers broader community-wide factors impacting the self-employed.

Previous research on entrepreneurs and the self-employed has yielded at least three important insights. First, personal characteristics such as experience or age, educational attainment, ethnicity, access to collateral and labor market characteristics (discrimination, industry, unemployment rates, etc.) vary systematically among those who are self-employed and those who are

not (e.g., Evans and Leighton, 1989; Lazear, 2005; Parker, 2004; Mar, 2005). Second, returns to self-employment tend to be lower than returns to wage-and-salary employment on average, suggesting that psychic income plays an important role in the self-employment decision (Hamilton, 2000). Self-employment rates also are sensitive to differences in the relative returns to self- as opposed to wage-and-salary-employment (Cowling and Mitchell, 1997; Goetz and Rupasingha, 2007). Third, the opportunity to work in a family-owned business is a key to becoming self-employed (Fairlie and Robb, 2005).

At the same time, recognition is growing of the profound value of trust and social networks and relations to individuals' economic success (Durlauf and Young, 2001; Parker, 2004).<sup>3</sup> Further, entrepreneurs and the self-employed rely on auxiliary local supporting businesses to operate efficiently and profitably. These range from business support services such as photocopying and legal advice to daycare providers or temporary help service agencies. Supporting businesses may also include coffee shops and drinking places where social networks are formed and nurtured.

Some communities contain business schools and community colleges that offer basic entrepreneurship or business training. These institutions may increase local self-employment returns. However, whether educational institutions matter empirically, and how, is unknown. The metro/non-metro status of a county may also matter but these variables are not directly amenable to policy influence. Florida's (2002) "creative class" has added another dimension to the understanding of the importance of innovation and the openness of communities to new ideas and human differences for potential entrepreneurial activity or self-employment. One such measure of openness of a community is the relative size of the foreign-born population.

The dramatic growth in self-employment shares over the last three decades is evident from Figure 1. Between 1969 and 2005 the number of full- and part-time non-farm self-employed workers or proprietorships more than tripled, from 9.6 to 32.9 million. In comparison, the number of full- and part-time wage-and-salary workers grew by only 97 percent, or 78.7 million, to 143.2 million workers in 2006. By 2005 the total number of wage-and-salary jobs had just recovered to pre-recession levels, reflecting the so-called “jobless recovery”. The ratio of self-employed to wage-and-salary workers nearly doubled, from 12 to 23 percent between 1969 and 2006, or from just over one-in-ten to one-in-five. If this trend continues, one worker will be self-employed for every four wage-and-salary workers by 2010.<sup>4</sup>

**\*\*Figure 1 about here\*\***

At the same time, returns to self-employment, or earnings per proprietor, lag far behind returns to wage-and-salary employment. In 1969, the average self-employed worker earned \$6,758, whereas the average wage-and-salary job paid \$6,507 (a ratio of 104 %). By 2005, the average self-employed worker earned almost \$10,000 less than the average wage-and salary worker: \$30,193 vs \$40,146, or 75 %. Further, entrepreneurial activity varies significantly across the United States (detailed county maps are available to interested readers upon request). Some places clearly are more conducive than others to the formation of new businesses, and offer greater opportunities than others for the self-employed to earn high incomes.

### **Methods, Variables and Data**

Acs and Storey (2004) point out that no single discipline can claim a monopoly on understanding the phenomenon of entrepreneurship. A key innovation in the present study is the consideration of factors normally studied in isolation within separate disciplines, such as economics

or sociology. Because of this isolation, earlier research may miss important interactions and relationships among the variables, and not control for all pertinent influences. This study endeavors to explain variation in the returns or rents that accrue to the self-employed in different US counties; previous studies of the latter are virtually non-existent. Our goal is to identify strategic policy and educational levers that may raise the productivity of the self-employed.

The basic analytical procedure is to relate county-wide (average) characteristics measured in the base year 2000 to subsequent change (through 2005) in the returns to entrepreneurial activity. The change model is more challenging to estimate than a levels-model (i.e., it imposes a higher standard) but it also yields more reliable results since simultaneity is less of a statistical issue. One key advantage of using county-level data is that selection and other biases inherent in individual-level data are avoided. On the other hand, the possibility of ecological fallacies cannot be ruled out.<sup>5</sup>

The dependent variable is the percent change between 2000 and 2005 in the average annual return to self-employment ( $e$ ) calculated using data from the Bureau of Economic Analysis, Regional Economic Information System (REIS). This identifies regions and communities that provide greater opportunities by rewarding those who are adapting more quickly to the pronounced trend away from wage-and-salary employment shown in Figure 1.

The relative change in the returns to non-farm self-employment in county  $i$  from period  $t$  to  $t+\Delta t$  is based on a Mincer-style equation and hypothesized to be a function of initial average returns to self-employment, individual-level characteristics ( $\Omega$ ), county-level characteristics that are and are not under the control of county decision-makers ( $\Theta$ ) and historical variation in the returns to self-employment ( $\xi$ ). All of the independent variables are measured in the base year  $t$ , or as close to that year as possible.

$$(1) \quad e_{i,t+\Delta t} = f(e_{i,t}, \mathbf{\Omega}, \mathbf{\Theta}, \xi)_{i,t}$$

This linking of entrepreneurial returns to the local economic and social conditions in a community, described next, distinguishes the present study from previous efforts in this area.

Individual-level factors ( $\mathbf{\Omega}$ ) that are hypothesized to matter in this context are the human capital levels of the self-employed or entrepreneurs and other population characteristics described below. Human capital, including on-the-job experience not only gives individuals potential ideas about and an enhanced alertness to new opportunities and possibilities (Kirzner, 1979), but also the wherewithal and knowledge to act profitably upon those opportunities.

These county-level population characteristics serve as proxies for characteristics of the population pool from which the self-employed are potentially drawn. Age is measured using the population median age in the county and it reflects work and other life experience; in accordance with Mincer's work, we include a quadratic term to allow for diminishing returns. Educational attainment is measured as the percent of adult (25 years or older) population having completed at least a bachelor's degree and high school or more but no bachelor's degree (using less than a high school degree as the reference category). While these variables may represent an imperfect match between the level of each characteristic (such as educational attainment) and the share of self-employed, measurement errors can be assumed to average to zero over the entire population.

Other population characteristics, such as gender and place of birth are often related to labor market discrimination, including institutionalized barriers such as "glass ceilings" within executive-level occupations. Self-employment is a means of escaping such discrimination. In addition, certain foreign-born ethnic groups not only have social networks that facilitate self-

employment but also cultures and expectations of self-employment or entrepreneurship that are passed on between generations. The presence of foreign-born individuals may also suggest greater tolerance to individual ethnic differences, so that ethnic minorities feel more welcome in a community (Florida, 2002). These data are also from the 2000 US Census of Population.

For county-level features (⊙) we distinguish among general supporting industries including those that provide educational services, industry controls, and other pertinent county-level characteristics that may be subject to policy influence. In addition, county measures not subject to policy influence are included. We also include a metro/non-metro indicator variable in the regression.

Entrepreneurs and the self-employed are hypothesized to be more productive if they can outsource business process and related functions to other specialized firms in the local community. For example, by outsourcing tax accounting and other book-keeping activities they can focus on their core business. Business-supporting establishments include couriers and messenger services (NAICS 492), office supply and stationary stores (453210), computer and software stores (44312), business support services (5614), temporary help services (561320), and child daycare providers (624410).

Self-employed workers who are unable to learn relevant skills on the job or from their parents need basic training in how to run a business. Or, nascent entrepreneurs need technical training on how to manufacture a new product at low cost. The presence of educational establishments is hypothesized to be associated with higher self-employment rates and earnings in the communities in which they are located. These establishment counts include junior colleges (NAICS 611210), business schools and computer and management trainings (6114), and technical and trade schools (6115).<sup>6</sup>

Certain industries, such as construction, are inherently more amenable to self-employment both for reasons of tradition and low barriers to entry (e.g., Van Stel and Storey, 2004). For example, custom home builders are often self-employed, and subcontract with crews of self-employed carpenters, bricklayers, plumbers, electricians and landscape architects.

Industry churn and job displacement – critical variables in a dynamic market economy – are expected to be associated with lower returns to self-employment, at least in the short-run, as individuals are pushed into such self-employment rather than seek it voluntarily. The prediction for lower returns is based on the empirical regularity that workers who switch between industries tend to experience a drop in earnings. The industry churn variable, also used by Levernier et al. (2000), is the sum of the absolute differences in employment shares calculated for one-digit industries in 1990 and 2000, divided by 2. The greater this value, the greater the churn, which produces lower returns to self-employment.

Also included in the regression is the coefficient of variation of returns to self-employment, as a measure of risk, and the beginning-period returns to self-employment and the number of self-employed workers. These are calculated using REIS data from the Bureau of Economic Analysis.

Finally, we discuss the primary variables of interest – those capturing the big-box and the coffee shop phenomena. The number of Wal-Mart stores, used to represent the presence of big-boxes, is from the Rand McNally Road Atlas sold in the chain. Big-box retailers have been shown to drive out small local businesses, such as self-employed mom-and-pop stores, by taking advantage of enormous scale economies and providing consumers with a more convenient one-stop shopping experience. A growing body of research, starting with the seminal work of Stone (1997) and Basker (2005) suggests that big-boxes displace other stores and reduce retail em-

ployment, but their effect on returns to self-employment have not been investigated systematically.

Sobel and Dean (2007) argue that prior research on big-box impacts is based on an incomplete understanding of the Schumpeterian process of creative destruction. The existing research focuses on displacement of similar businesses, i.e., those that provided the same kinds of retail services as are provided by big-boxes, while Schumpeter argued that entirely new kinds of businesses emerge from the creative destructive process, in different industries. Money that consumers save by shopping at big-boxes is instead spent on goods and services provided by these new firms. For example, a mom-and-pop hardware store may be replaced by an upscale restaurant or a high-end computer consulting business. According to these authors, one would expect no net effect of the presence of big-boxes in a community on self-employment. However, if labor resources are reallocated to more profitable (higher-productivity) endeavors, the returns to self-employment will be higher in communities with more big-box stores, all else equal.

Unlike the Wal-Mart chain's stores we cannot easily or separately measure the presence of Starbucks outlets to capture the coffee shop phenomenon. While the company's web-site lists stores in each state as of the current date, data from 2000 are needed to avoid or reduce endogeneity issues, and these are not available. Instead, we use a special dataset tabulated for us by the US Economic Census for 2002 on coffee shops (NAICS 7222135) to represent the Starbucks phenomenon and the standard dataset for 2000 on drinking places (NAICS 722410) from the US Census Bureau's County Business Patterns.<sup>7</sup>

We estimated equation (1) using the spatial error model with state fixed-effects and MLE methods. The model takes into account both spatial autocorrelation of non-farm operators' average earnings growth and state-specific unobserved heterogeneity that may arise from state-level

policies and the entrepreneurial environments that enhance or reduce non-farm proprietor's earnings. The model estimated is as follows.

$$(2) \quad e_{i,t+\Delta t} = \mathbf{X}\beta + \mu, \quad \mu = \lambda W\mu + \varepsilon, \quad \varepsilon \sim N(0, \sigma^2_{\varepsilon})$$

where  $\mathbf{X}$  represents the matrix of observations of exogenous variables discussed above and dummy variables for states,  $\beta$  is the parameter vector to be estimated,  $\mu$  an error term comprised of  $\lambda$  – the spatial autoregressive parameter for the lag in error term, i.e.,  $W\mu$ , and  $\varepsilon$  is a vector of innovations.  $W$  is a queen-contiguity spatial weights matrix of dimension  $n \times n$ .

The selection of the final model was based on a statistical comparison of a series of competing model specifications. First, a spatial diagnostic test was performed to determine whether the spatial model is preferred to the OLS model, and then a determination was made of the type of spatial model that is appropriate. The spatial lag and error Lagrange Multiplier tests and their robust forms produced test statistics that were highly significant statistically. The test statistic for the robust LM error test was greater than that of the robust LM lag test. Using the decision rule of selecting among spatial models given in Anselin (2005), the spatial error model was selected over the spatial lag model. Next, we estimated spatial error models with and without state-fixed effects incorporating the dummy variables for all states (less one) to account for state-level unobserved heterogeneity. The likelihood ratio tests showed that the spatial error model with the state fixed-effect outperformed the spatial error model without state fixed-effects (LR scores ranged from 299.5 to 299.8 with a critical value of 82.7 at the 1% level of significance).

Three models are estimated, representing different specifications (or theories of the process that determines self-employment returns). Model-I is the basic version and includes all vari-

ables except those of primary interest – i.e., those capturing Schumpeterian destruction and social capital-generation from a Putnam process. In Model-II we add the Wal-Mart effect as well as the effect of drinking places and coffee shops, to assess the independent effects of these establishments. Finally, Model-III includes interaction terms between the Schumpeterian- and Putnam-effects to assess whether they mutually reinforce or counteract one another. LR chi-squared tests were performed to compare these models and determine if inclusion of additional variables was statistically justifiable. According to the test results, Model-III is favored over Model-II and Model-II is favored over Model-I, at the 1% level of significance or lower.

## **Results**

### *Descriptive Results*

Summary statistics for the variables included in the models are presented in Table 1. In 2000 (the beginning year of the period studied), the county-level annual average return to self employment was \$16,834, and this on average grew by 4% over 2000-2005. The average income risk of self employment measured over the preceding decade was 17%. The average number of Wal-Mart stores across all counties was 0.93, and there were an average of 16 drinking places and 3 coffee shops per county (of course, some counties had no such establishments).

**\*\*Table 1 about here\*\***

The spatial concentration of changes in the returns to self employment between 2000 and 2005 (the dependent variable) is presented in Figure 2. Selected regions of the country contained clusters of counties with especially high increases, while the growth in returns was especially low in some areas. In other regions, counties with especially high increases were located next to counties with very low changes. Figure 2 confirms visually the results of the formal statistical tests for spatial auto-correlation in the dependent variable, which necessitates the use of a spatial weighting matrix as discussed above.

**\*\*Figure 2 about here\*\***

### *Multivariate Results*

Table 2 provides estimates for the annual earnings growth of non-farm proprietor's employment (self-employment) for the period 2000-2005 while accounting for spatial correlation as well as state-level unexplained variation. For the most part the results are consistent with prior expectations. For example, as expected the effect of age on self-employment earnings growth is initially positive (up to about 37 years of age), and then becomes negative. The coefficient estimates for both linear and quadratic terms are statistically significant. College completion has a statistically significant, positive effect on self employment earnings growth, showing that higher levels of education convey an earnings advantage to the self-employed (as predicted from Mincer's model).

Counties with greater shares of women in the labor force and greater shares of foreign-born population experienced greater increases in the rate of growth of self-employment earnings, as expected. These results likely reflect a combination of cultural factors as well as labor market discrimination on the one hand, and greater tolerance for newcomers, on the other.

**\*\*Table 2 about here\*\***

Metro counties experienced smaller increases in the returns to self-employment, all else equal. The presence of supporting service establishments is associated with higher growth of self-employment returns. This suggests a clear productivity-enhancing effect for the self-employed of outsourcing non-core functions. On the other hand, educational establishments had no effect statistically, indicating that there is room to expand their contributions in the future. Counties with larger shares of employment in the construction sector enjoyed greater growth in self-employment earnings while the opposite was true of the effect of industry churning. This may imply that many self-employed turn to working for themselves not because they have a good business idea but out of necessity after losing their wage-and-salary employment.

Greater initial risk of self-employment in a community is associated with higher subsequent returns, suggesting that a risky and dynamic community environment also provides the possibility of greater reward. Higher self-employment earnings in the initial year of the period studied are negatively associated with subsequent growth rates, on the other hand, which is a type of convergence familiar from other economic growth studies. Also, counties with larger numbers of self-employed workers in 2000 experienced smaller growth in earnings, possibly reflecting greater competition among the self-employed.

Big-box retailers, especially Wal-Mart, have been maligned recently for their effects on local communities (e.g., Goetz and Swaminathan 2006; Goetz and Rupasingha 2006). The present study finds that this big-box chain has no such effect as far as increases in the returns to self-employment are concerned. Each additional beginning-period Wal-Mart store in a county raised

the subsequent growth in the returns to self employment by 2.2%, i.e., by \$370 from the mean level of returns to self employment in the initial period studied. This confirms the Schumpeterian prediction of creative destruction whereby the surviving self-employed are more productive as a result of competitive pressures.

The social capital-generating establishments that capture the Putnam effect show that drinking places (bars, taverns, or nightclubs) are associated with statistically higher growth in returns to self-employment, all else equal. This confirms, at the county-level, the results of individual-level research which suggests that individuals who imbibe alcohol have higher earnings because they also engage in more social networking (e.g., Hamilton and Hamilton, 1997). However, we find no such effect for coffee shops (the Starbucks phenomenon).

In addition, we explored interactions between Wal-Mart stores and drinking places in a community. The effect of this interaction is highly significant statistically, and negative, suggesting that the presence of both types of establishments in a county is leads to lower productivity among the self-employed over time. The interaction between Wal-Mart and coffee shops was not statistically different from zero. Finally, the significant coefficient estimate of the spatial lag parameter in the error term ( $\lambda$ ) provides evidence of spatial dependence in the growth of returns to self employment, even after we account for state-level unobserved variation.

## **Conclusion**

This study reveals the merits and importance of examining the rewards of entrepreneurial and self-employment activity within the broader context of the local communities and economies in which it occurs. Even as the Internet is widely believed to reduce if not eliminate the importance of space and distance, the locally-varying factors that distinguish one place from another are be-

coming increasingly critical. Perhaps most significantly, the study identifies locally-varying factors that account for differences in the returns to self-employment over space. Previous studies on this topic, and of this nature, are virtually non-existent. The finding about the relationship between foreign born status and self-employment rates and returns is important given current policy deliberations surrounding immigration.

This study provides numerous new insights into the variables that affect self-employment returns, including the importance of various types of local supporting businesses, educational institutions, salient individual-level characteristics, venues for social networking and especially, the effect of Wal-Mart's phenomenal recent expansion. Other studies suggest that the employment efficiencies introduced by the chain reduce retail job creation, and suppress retail earnings, at least in the short-run. However, the competitive pressures created by the chain also raise the returns to self-employment by increasing the productivity of the surviving mom-and-pop stores while driving out the least profitable operations. Presumably some of these individuals end up working for Wal-Mart, and in the process earnings inequality may increase. Also, the positive impact of Wal-Mart stores on self-employment returns is counteracted in important ways by the presence of drinking places. The Starbucks effect, which we were able to measure only indirectly, appears to be less important at this time, at least statistically.

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FIGURE 1:

Trends in Wage-and-Salary Employment, Self-Employment, and Ratio, 1969-2006, USA

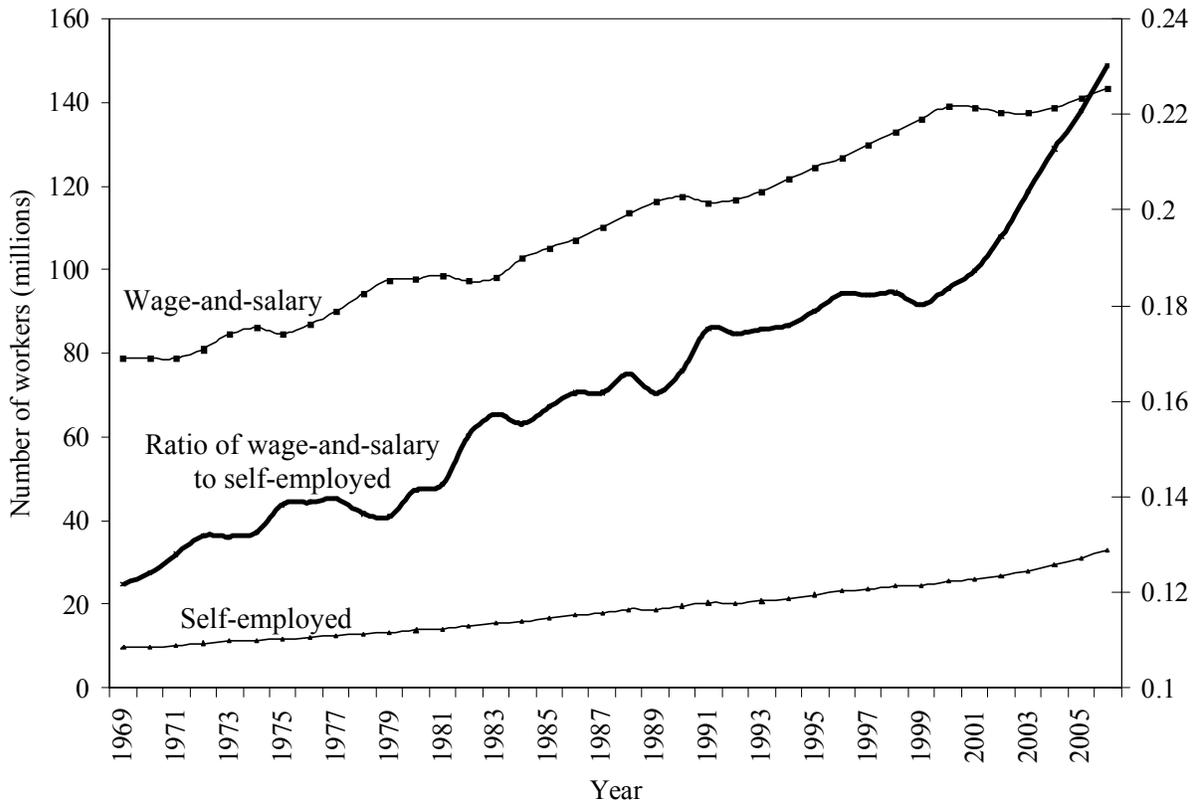
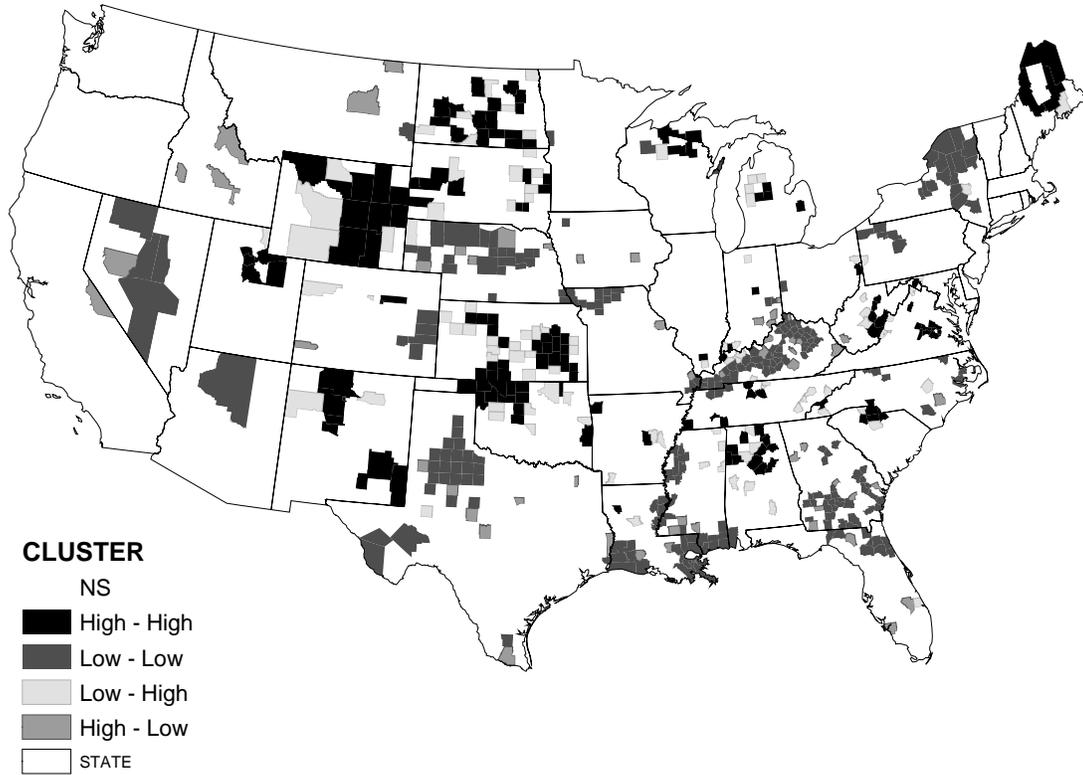


FIGURE 2:

Hotspots and Coldspots for Self-Employment Income Growth, 2000-2005, USA



**TABLE 1:**

## Descriptive Statistics

Variable	Mean	SD	Min	Max
Non-farm proprietor's earning growth (%), 2000-2005 <sup>1</sup>	4.077	38.338	-450.660	353.343
Median age of population (years), 2000 <sup>2</sup>	37.403	3.931	20.600	54.300
Median age of population (years), 2000 squared	1414.4	292.6	424.3	2948.5
Bachelor's degree or more (% of adults), 2000 <sup>2</sup>	16.365	7.595	4.921	60.482
High school or more but not bachelor's degree (% of adults), 2000	60.980	6.885	27.589	81.081
Female in labor force (% of total), 2000 <sup>2</sup>	46.110	2.326	33.753	84.497
Population foreign born (% of total), 2000 <sup>2</sup>	3.393	4.735	0.000	46.127
Metro county, 2003 (yes=1) <sup>4</sup>	0.342	0.474	0.000	1.000
Support services establishments (number), 2000 <sup>5</sup>	27.273	110.638	0.000	2958.0
Educational establishments (number), 2000 <sup>5</sup>	4.598	18.597	0.000	501.0
Construction employment (% of total), 2000 <sup>2</sup>	7.729	2.379	1.700	22.511
Industry churn, 1990-2000 (see text) <sup>3</sup>	0.129	0.033	0.039	0.443
Non-farm proprietor income risk (CV), 1995-2004 <sup>1</sup>	16.811	8.497	3.288	70.727
Average non-farm proprietor's income (\$1,000), 2000 <sup>1</sup>	16.834	7.378	3.817	158.876
Non-farm proprietor's employment (No. in 1,000), 2000 <sup>1</sup>	8.140	29.574	0.047	1089.45
Wal-Mart stores (number), 1998 <sup>7</sup>	0.930	1.590	0.000	27.000
Drinking places (number), 2000 <sup>5</sup>	16.338	49.798	0.000	1167.0
Coffee shops (number), 2002 <sup>6</sup>	2.989	15.563	0.000	453.0
Wal-Mart Stores1998_Drinking places2000 <sup>5,7</sup>	14.166	185.441	0.000	8154.0

Data sources: 1. Regional Economic Information System (REIS), Bureau of Economic Analysis (BEA), 2. US Population Census 2000, 3. US population Census 1990 and 2000, 4. Beale code, Economic Research Service (ERS), USDA, 5. County Business Pattern CD Rom, 2000, 6. Economic Census CD Rom, 2002 7. The Rand McNally Road Atlas sold in the chain

**TABLE 2:**

Spatial Error Models [State Fixed-Effects] Explaining County-level Non-Farm Proprietor's Average Annual Earnings Growth (%), 2000-2005, USA

Variable	Model-I		Model-II		Model-III	
	Coefficient	z-value	Coefficient	z-value	Coefficient	z-value
Constant	-175.78***	4.21	-170.31***	4.09	-157.91***	3.79
Median age of population (years), 2000	7.641***	4.18	7.766***	4.26	7.450***	4.09
Median age of population (years), 2000 squared	-0.103***	4.23	-0.104***	4.27	-0.100***	4.11
Bachelor's degree or more (% of adults), 2000	0.724***	6.22	0.714***	6.00	0.666***	5.57
High school or more but not bachelor's degree (% of adults), 2000	-0.134	0.82	-0.168	1.03	-0.176	1.08
Female in labor force (% of total), 2000	1.443***	4.55	1.254***	3.93	1.140***	3.56
Population foreign born (% of total), 2000	0.644**	2.90	0.618**	2.79	0.494*	2.21
Metro county, 2003 (yes=1)	-0.813	0.51	-2.052	1.27	-3.029+	1.86
Support services establishments (number), 2000	0.116***	3.78	0.074*	2.27	0.083*	2.54
Educational establishments (number), 2000	0.188	1.03	0.266	1.24	0.150	0.69
Construction employment (% of total), 2000	1.027**	3.22	1.110***	3.49	1.167***	3.67
Industry churn, 1990-2000 (see text)	-133.24***	6.62	-131.9***	6.55	-129.9***	6.46
Non-farm proprietor income risk (CV), 1995-2004	1.377***	18.98	1.386***	19.15	1.394***	19.29
Average non-farm propr. income (\$1,000), 2000	-1.886***	16.8	-1.946***	17.2	-2.015***	17.6
Non-farm proprietor's employment (1,000s), 2000	-0.392***	5.43	-0.394***	5.30	-0.268***	3.28
Wal-Mart stores (number), 1998			1.873**	2.82	2.242***	3.35
Drinking Places (number), 2000			0.063*	2.39	0.125***	4.00
Coffee shops (number), 2002			-0.074	0.66	-0.147	1.29
Wal-Mart stores, 1998_Drinking places, 2000					-0.007***	3.69
$\lambda$	0.203***	7.30	0.204***	7.37	0.206***	7.44
R-Squared	0.300		0.304		0.308	
Log-Likelihood	-14,839		-14,829		-14,822	
N	3,034					

\*\*\* $p < 0.001$ , \*\* $p < 0.01$ , \* $p < 0.05$ , + $p < 0.1$

## Endnotes

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<sup>1</sup> We recognize that not all entrepreneurs are self-employed, and not all self-employed workers are necessarily entrepreneurial.

<sup>2</sup> The emergence of flexible as well as informal and contingent forms of work has been noted by economic geographers (e.g., Peck 2001; Peck and Theodore 2007) and sociologists (e.g., Ritzer 2004).

<sup>3</sup> As another illustration, the 2007 Kauffman Foundation Prize Medal for Distinguished Research in Entrepreneurship was awarded to Harvard University's T. Stuart for his work on the effects of social networks on entrepreneurship.

<sup>4</sup> This trend explains the popularity of books such as *Secrets of Self-Employment – Working from Home* (1996); *Free Agent Nation* (Pink 2001); *Multiple Streams of Income* (Allen 2005) and, more recently, *The Disposable American* (Uchitelle 2006).

<sup>5</sup> Here incorrect inferences are drawn about the behavior of individuals from aggregate measures of members in their group; in other words, not all individuals with a certain characteristic (such as a high school degree) will behave in the same manner as the group will on average.

<sup>6</sup> Note that these institutions employ large numbers of scientists, faculty and staff, which reduces county self-employment ratios by increasing the denominator and this gives rise to a possible ecological fallacy. To address this concern, the percent of civilian employment in professional, scientific, management, administrative, waste management, education, health and social services was included in an auxiliary regression as a control variable but the results did not change materially. When colleges, universities and professional schools (611310) are included separately they have negative effects.

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<sup>7</sup> We also included cafeterias in these regressions (NAICS 722212) and they consistently yielded a positive coefficient estimate.