An Anatomy of Entrepreneurial Pursuits in Relation to Poverty

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Abstract

This study examines the causal relationships between inequality, poverty, and entrepreneurship. We hypothesize that income inequality influences entrepreneurial activity, and entrepreneurial activity alleviates absolute poverty. Findings from a longitudinal analyses of a dataset from all 50 U.S. states over an 18-year period provide robust support for these hypotheses. Furthermore, the results suggest that antipoverty public policy aimed at encouraging work (i.e. Earned income tax credit, EITC) can be detrimental to entrepreneurial activity. These findings underscore the importance of linking public policy efforts aimed at poverty alleviation with those aimed at encouraging additional entrepreneurship.

Key words: *Entrepreneurial activity; income inequality; opportunity; poverty; public policy; development*

Introduction

'If the poor are abundant, wages will be low, which makes it much more tempting to be an entrepreneur who hires labor rather than a small-scale producer who works on his own. When the rich are relatively abundant, the opposite it true'

- *(Banerjee and Newman, 1994: 214)*

The notion that entrepreneurship is an engine for poverty alleviation in society has recently become more popular among scholars and policymakers (Ahlstrom, 2010; Al-Dajani et al., 2015; Banerjee and Newman, 1994; Baumol, 1990; Bruton, Ahlstrom and Si, 2015; Fairlie, 2012; McMullen, 2011; Ribeiro-Soriano, D. 2017.Schumpeter, 1934; Si et al. 2015.). Conventional wisdom dictates that entrepreneurial activity creates wealth in society (e.g. through employment and spillovers), which in turn increases the potential for poverty alleviation and economic growth in society (Fairlie, 2005), although we would expect differences in these effects across countries depending on institutional considerations (Cullen et al., 2014; Dam et al., 2014; Tomizawa, Zhao, Bassellier, and Ahlstrom, 2019). These widely held views about the importance of entrepreneurial activity have fueled many government initiatives across the world aimed at fostering entrepreneurship (Nikolaev Boudreaux, and Palich, 2018). Some notable examples include the $2 Billion *Startup America* White House initiative in the United States (U.S.), the Chinese Government-backed $6.5 billion venture capital fund in China, and the Youth Enterprise Support (YES) government initiative in Ghana.

Extant research suggests that the broad determinants of entrepreneurial activity include the following factors: market conditions, education, finance, information, spillovers and agglomeration economies (Fairlie and Chatterji, 2013; Koryak et al., 2015; Marlow et al., 2017); as well as institutional, legal and political factors such as taxation, intellectual property rights,

start-up costs and failure costs (Djankov et. al., 2002; Klapper et al., 2006; Klein et al., 2010; Nikolaev et al., 2018; Xue and Klein, 2010). Nevertheless, research interest on the relationship between poverty and entrepreneurial activity from a management perspective is still at a nascent stage, with very limited empirical insights on the phenomenon (Beal and Astakhova, 2017; Halvarsson, Korpi and Wennberg, 2018). Some of these recent efforts have yielded insights related to the functioning of entrepreneurial activities in base-of-the-pyramid (BOP) markets, especially in developing countries (Bradley, McMullen, Artz, and Simiyu, 2012; Hall, Matos, Sheehan, and Silvestre, 2012; London et al., 2014; Prahalad, 2004). Still, we lack a coherent empirical picture of the causal mechanisms that underlie the relationship between entrepreneurship and poverty. Specifically, it is unclear to what extent inequality may contribute to entrepreneurial activity. Or what mechanisms may enable entrepreneurial activity to impact poverty?

In this study, we focus attention on these related questions with the view to develop a coherent understanding of the complex relationship between entrepreneurial activity and poverty. Entrepreneurship is a complicated and multifaceted concept. We make two principal claims in our work. First, we suggest that income inequality actually has a positive impact on entrepreneurial activity by highlighting the tension between opportunity costs and entrepreneurial action (see first opening quote from Banerjee and Newman, 1994). Second, we advance the notion of an *entrepreneurial activity hierarchy* (EAH), which suggests that some forms of entrepreneurial activity have greater potential to alleviate poverty than other forms. In particular, we highlight the dominance of entrepreneurial activity that are firm-centric or opportunity-centric for alleviating poverty. The idea is that entrepreneurial activity that resembles firms not markets, opportunities not necessity are more efficient for poverty

alleviation because of their signaling potential, which can help orchestrate economic opportunities, spillovers, and economic growth in society.

We examine these hypotheses using a comprehensive U.S. state-level, panel dataset over an 18-year period (1996-2013). The empirical evidence suggests that the relationship between inequality, entrepreneurship and poverty is rather complex. The findings demonstrate that as a matter of economic and ethical consequences, inequality causes entrepreneurial activity of different forms. However, entrepreneurial activity does not cause inequality. In addition, we did find evidence consistent with the view that there is a hierarchy in entrepreneurial activity relative to absolute poverty alleviation.

Theoretically, our work departs from previous efforts by disentangling two related forms of income distribution problems in modern society, that is, inequality and absolute poverty, and then considering their distinct relationships with entrepreneurial activity. In our view, income inequality is concerned with the distribution of wealth in society, wherein higher wealth concentration in uppermost decile of a given society is indicative of higher levels of income inequality (Halvarsson et al., 2018). On the other hand, absolute poverty is concerned with the proportion of people that are living below the poverty line in a society. By disentangling these two forms of income distribution problems, our research contributes to better understanding of how on the one hand, income inequality can cause entrepreneurial activity; and on the other hand, how entrepreneurial activity in turn influences absolute poverty.

A second contribution of our research is to reify recent theoretical reasoning that different forms of entrepreneurial activity are not created equal (Baumol, Litan, and Schramm, 2007), particularly with respect to their varying influence on poverty alleviation. Specifically, we delineate the influence of firm-centric and opportunity-centric entrepreneurial activity in poverty

alleviation. In addition, post hoc analysis reveals that public policy aimed at alleviating poverty through work-based programs (i.e. the Earned Income Tax Credit, EITC) is actually detrimental to firm-centric and opportunity-centric entrepreneurial activity. Overall, the study demonstrates that future research, discussions, and public policy may need to adopt a more nuanced view when considering the relationships between inequality, poverty and business; and should consider the potential of strategically, linking public policy efforts aimed at poverty alleviation with those aimed at encouraging entrepreneurship.

Background

The primary focus of this study is on the interplay between poverty and entrepreneurial activity at the state level. There are two broad views of poverty in the prior literature. One perspective suggests that poverty is the degree to which people in a given state or political economy experience income shortfalls. This view of poverty is often referred to absolute poverty since it captures the overall income shortfalls based on a chosen poverty line in the given society. The second perspective of poverty is the relative view of poverty, which is more concerned with the degree to which a greater proportion of people in society have very limited wealth. We focus on absolute poverty because of it is often a target for policymakers who are interested in alleviating economic deprivation in society.[1] In a related manner, the distribution of income in society has garnered recent attention in the literature and in policy making. As a topic of economic and ethical concern, inequality embodies the differences in the regular receipt of economic resources over time, in exchange of labor or capital usage (Beal and Astakhova, 2017), and the inherent morality

[1] We thank a reviewer for highlighting this important rationale.

of such differences (Simpson, 2009). Thus, income inequality accounts for social referencing between members of the same society, which has the potential to stimulate economic activity among disadvantaged members of the society.

In advanced economies such as the U.S., income is officially used to measure absolute poverty levels. There is growing recognition that poverty measures based on income alone tend to overlook dynamic disparities in consumption patterns that result from inequalities across families in the accumulation of assets or access to credit (Meyer and Sullivan, 2003; 2004; Ziliak, 2006). In the U.S., the country's reputation for fostering meritocracy has, historically, been a source of pride; it is striking that income inequality is at its highest levels since the 1920s (Beal and Astakhova, 2017), though this excludes transfer payments and other benefits which have risen sharply since that time.

Theory and Hypotheses

Inequality and Entrepreneurial Activity

To examine the theoretical relationship between inequality and entrepreneurial activity, we must consider two potential arguments. First, the level of inequality in society is important due to its potential influence on opportunity costs for the individual considering entrepreneurial activity. Theory suggests that at higher levels of inequality in society, entrepreneurs will find it more tempting to start new businesses because their alternative income/opportunity cost is less attractive than being an entrepreneur (Banerjee and Newman, 1994; Evans and Leighton, 1989). For example, Fairlie and Chatterji (2013) found that while large opportunity costs (due to a very tight labor market in the 1990s Silicon Valley compared to the rest of thecountry) suppressed

entrepreneurial rates during this period; lower opportunity costs in the post late 1990s increased entrepreneurial activity relative to the U.S.. Also, Hsu et al. (2007), in a study of the entrepreneurial activity of MIT alumni, found that lower opportunity costs due to high unemployment or economic recessions, could provide incentives to enter entrepreneurship. Furthermore, historical accounts have shown that entrepreneurial activity rises during periods of high inequality, because "… of a perception by those who innovate that they have an unequal position relative to some key referent group in their society, and who subsequently pin their hopes on undertaking entrepreneurial activities that will reduce this gap" (Brenner, 1987: p. 97).

Second, relatively higher levels of income inequality in society can lead to opportunities for entrepreneurs to act for both self and collective interest. That is, extremely high levels of inequality help reveal systemic inefficiencies/imperfections in the society that would translate to greater, scalable opportunities for entrepreneurial action. The critical assumption here is that entrepreneurs are motivated, not just by self-interest, but by collective (prosocial) interest as well (Van de Ven, Sapienza and Villanueva, 2007; Miller, Grimes, McMullen and Vogus, 2012; Simpson, 2009). On the one hand, inequality will spur entrepreneurial action because human beings are egotistic, and cannot survive without taking actions to improve their economic condition. Yet, on the other hand, inequality as a moral concern could also lead citizens to take actions toward wealth redistribution (see Simpson, 2009).

This suggests that entrepreneurs need not be poor themselves to recognize and take action to address inefficiencies in society. For example, Muhammad Yunus, the notable founder of Grameen Bank, empathized for poor families and recognized they did not have access to regular banking. As Van de Ven and colleagues (2007: 358) state, "Had Dr. Yunus been interested

exclusively in his self-interest, he could not have seen or envisioned this opportunity, and Grameen Bank would have probably never existed" (p. 358).

In sum, the arguments described above suggest that higher rates of inequality in a state have the potential to encourage more entrepreneurs, who are motivated by either self-interest or/and collective interest to reduce inequality in society. Therefore,

> ***Hypothesis 1 (H1):*** *States with higher levels of income inequality will subsequently have higher rates of entrepreneurial activity.*

Entrepreneurial Activity Hierarchy for Poverty Alleviation

In the previous analysis, we argued that inequality, which is a construct of wealth disparity in society, would lead to increased entrepreneurial activity of different forms. Yet, we expect that entrepreneurial activity also has the potential to mitigate absolute poverty, oftentimes due to increases in wealth, productivity, and economic opportunities (Baumol, 1967; 1990; World Bank, 2004).[2] For example, entrepreneurial activity provides a source of income that enables economic development including access to health care, reduced unemployment, and education. It also improves consumption through the introduction of goods and services previously unavailable to the poorer segments of society (Ahlstrom, 2010; Christensen -luck book; Newman, Schwarz, and Ahlstrom, 2017).

Not all entrepreneurial activity, however, will lead to poverty alleviation at the same levels. That is, entrepreneurial activities and their wealth creation potential vary. Therefore, we advance the notion of an entrepreneurial activity hierarchy (EAH), which suggests that certain

[2] Though we argue that entrepreneurial activity alleviates absolute poverty, we do not, a priori, assume that entrepreneurial activity can directly influence inequality. Indeed, it may be far-fetched to assume that entrepreneurs are capable of directly redistributing wealth in free market societies.

entrepreneurial activity are better inclined to yield economic wealth and spillovers in the form of employment, human capital development (Georgen et al., 2012), institutional development, and economic development. In this hierarchy, we contend that entrepreneurial activities that center around firm creation, or the pursuit of an identified market opportunity, will have the tendency to elicit configurations that are scalable, thereby attracting the resources that can lead to systemic wealth creation.

First, entrepreneurs who engage in the process of firm creation often implicitly have the intentions to employ others and to scale their ventures. Creating and running a formal firm takes effort and cost, which can be bettter justified when entrepreneurs intend the scale their ventures. In addition, firms provide the necessary legitimacy and platform for acquiring complementary resources for growing the new venture (e.g. financing, partnerships, and gaining tax incentives). This is consistent with the view that the higher the degree to which entrepreneurs appeal to the collective (in addition to self-interest) in developing a new venture, the greater the likelihood that they will be successful in mobilizing resources (Van de Ven et al., 2007), developing networks, and adapting to changing conditions (Bryson, Wood, and Keeble, 1993). In contrast, self-employment activities (in their basic form) are not scalable and are rarely a source of employment for others (Chen et al., 2017). The psychological differences between self-employment and entrepreneurship could exacerbate these effects (Wiklund et al., 2019), whereby entrepreneurship feeds into a critical psychological resource in terms of optimism and reliance; while self-employment affords fewer psychological feedback effects through limited wealth creation. Thus, we argue that firm-centric entrepreneurial activity would lead to greater economic wealth in society than mere self-employment.

Second, entrepreneurs who pursue opportunities that leverage their experience in industries and markets often elicit entrepreneurial configurations that are scalable (i.e. opportunity-centric entrepreneurial activity). This is because their prior knowledge will influence the quality of opportunities they choose, thereby providing them with an advantage over competitors (Hayek, 1945). Opportunities that are derived from deep knowledge and experience in an industry also help signal the quality of the new venture. Therefore, opportunity-centric entrepreneurs are able to establish a greater legitimacy to access complementary resources, which would increase the performance of their venture (Ahlstrom, Bruton, and Yeh, 2008).

Furthermore, entrepreneurs with this sort of prior knowledge have higher aspirations (Chivers, 2017), and are more likely to strive for the betterment of self and society. Thus, they are also more likely to establish higher thresholds for their performance, meaning that they are less likely to tolerate lower performance after they establish their ventures (Gimeno, Folta, Cooper and Woo, 1997). This tendency to establish a higher threshold for entrepreneurial performance at the outset would act as a fulcrum for creating a more effortful and scalable venture. In contrast, an individual who is unemployed before entering into entrepreneurial activity may be more focused on self-interest because they are lacking in options (Nikolaev et al., 2018), and therefore, maybe more willing to accept a lower threshold of performance because of the comparative lack of alternative employment opportunities. Thus, we expect that opportunity-centric entrepreneurs will create higher systemic wealth than ordinary self-employment entrepreneurs, who tend to be driven by the necessity to be in employment. This leads to the following hypotheses,

Hypothesis 2 (H2): *There is an entrepreneurial activity hierarchy at the state level in which the:*

H2a: *firm-centric entrepreneurial activity will lead to a more significant decline in absolute poverty rates than self-employment.*

H2b: *opportunity-centric entrepreneurial activity will lead to a more significant decline in absolute poverty rates than self-employment.*

Methods

Sample and Data

To test our hypotheses, we leverage annual state-level quantitative data from the U.S. The sample frame for this study included all 50 U.S. states over an 18-year time period (1996-2013). This period is especially important to analyze because of potential impact of the passage of major welfare reform there in 1996. A key theme from these reforms was the decentralization of welfare policy choices to the state and local levels (Ziliak, 2007).Given the increased local divergence d in welfare and poverty related policies, we would expect to observe variation on poverty outcomes.

The data for this research were assembled from various archival sources. The entrepreneurial activity data was drawn from the Kauffman Index for Entrepreneurial Activity (KIEA), which is based on the Current Population Survey of the United States (c.f. Fairlie, 2012; Fairlie and Chatterji, 2013). The poverty and state welfare policies data were drawn from U.S. government data sources including the Bureau of Labor Statistics, the Census Bureau, the Social Security Administration, and the Departments of Agriculture, Health and Human Services, Commerce, and Labor. Inequality data is drawn from data assembled by the Economic Policy Institute (Frank, Sommeiller, Price and Saez, 2015).

The food insecurity data comes from a nationally representative survey of over 50,000 households per year in the U.S. (Current Population Survey, CPS; Ziliak and Gundersen, 2009). The U.S. Census Bureau administers this survey as an annual supplement for the monthly CPS

survey. Each household is asked to respond to a number of questions about experiences and behaviors that indicate the household's level of food insecurity. These questions include being unable to afford balanced meals, having to cut the size of meals because of too little money for food, or being hungry because of too little money for food (Coleman-Jensen et al., 2012). Other data in the analysis was drawn from the Council of State Government's database and Stats America.

Measures

Dependent Variables—Entrepreneurial Activity. Three measures of entrepreneurial activity were used in this study (see Morelix, Russell, Fairlie and Reedy, 2015). The first measure, *firm-centric entrepreneurial activity* is a measure of startup density, which means the proportion of new businesses in a state to the total population of the state (in thousands) in a state at time, t. The second measure of entrepreneurial activity, *opportunity-centric entrepreneurial activity* is a proportion of entrepreneurs in a state that are focused on exploiting an opportunity (i.e. entrepreneurs that are driven primarily by "opportunity" as opposed to "necessity," Morelix et al., 2015). The third measure, *rate of new entrepreneurs* is the rate of business creation at the individual owner level (i.e. self-employment), aggregated at the state level (c.f. Kauffman index of entrepreneurial activity, Fairlie, 2012; Fairlie and Chatterji, 2013). This is defined as the percent of individuals (ages 20-64) who do not own a business in the first month that start a business in the following month with 15+ hours (Fairlie, 2012) The microdata used to create the entrepreneurial activity index is based on the basic monthly files to the Current Population Surveys (Fairlie and Chatterji, 2013). This measure of rate of new entrepreneurs is particularly advantageous over existing measures which fail to capture the dynamic nature of entrepreneurship in terms of the time the business is created (Fairlie and Chatterji, 2013).

Dependent Variable—Poverty. We developed a measure of absolute poverty using the U.S state-level measure of poverty, which captures the proportion of families in a state that are living below the U.S. established threshold of poverty, but which tend to exclude in-kind transfers such as food stamps (Ziliak, 2006). Thus, this measure of poverty accounts for the percentage of poor in thousands in a given state based on U.S. Census Bureau's definition of poverty thresholds (Osberg, 2000).

As an alternative measure to poverty, we use the proportion of households in a state that are classified as *very low food secure*. This measure of *food insecurity* has been used in prior economic research (e.g. Ziliak and Gundersen, 2012) and has been shown to be highly correlated with measures of poverty.

Independent Variable – Inequality. Income inequality can be measured in a variety of ways (Atems and Shand, 2018; Beal and Astakhova, 2017). Thus, we measure inequality using a composite measure of different measures, a novel approach when compared to prior literature. Using a principal components factor analysis with varimax rotation, we constructed a composite indicator of *inequality* based on six well-established measures of inequality used prior research (i.e. Gini Coefficient, Atkinson Index, Theil Entropy, Relative Mean Deviation, Top 1% Income Share, and Top 10% Income Share). These six measures are highly correlated (as shown in correlation matrix in Table I), and they loaded into a single factor of eigenvalue 5.07, with a very high interitem reliability coefficient (Cronbach alpha, standardized) of 0.96. This single factor, which we used in our regressions, accounted for 0.85 proportion of the total variance in the original six variables. In order to avoid potential problems of generated regressor bias, we use the Bartlett method to generate the factor scores for poverty. This method tends to yield less accurate though

unbiased factors compared with factor scores obtained with regression method (Westphal and Stern, 2007). Our results proved robust using either the Bartlett or regression method.

Control Variables. We include some control variables to account for alternative explanations in our model. We controlled for state antipoverty policies such as state earned income tax credit (EITC). Antipoverty public policies such as the Earned Income Tax Credit (EITC) are intended to reduce the incidence of poverty among people with low or no incomes by encouraging them to work. We suspect that while the EITC is intended to encourage work, especially among needy families, it could potentially undermine entrepreneurial activity. The EITC maximum credit (which is a measure of the generosity of the EITC for each state) is calculated for a family with two dependents, and it includes both the federal and state credits. Results are consistent when we used EITC maximum credit for a family of one dependent. Consistent with the argument that wage levels also affect entrepreneurial activity (Banerjee and Newman, 1994), we controlled for the minimum wage in each state. We use the labor economics definition of minimum wage, which is the higher of the federal or state minimum wage, measured in U.S. dollars (Neumark and Wascher, 2000). In the our main analysis, we reported models that only included the minimum wage control measures but not the EITC credit, since the two were highly correlated (r = 0.76). The results are not sensitive to excluding the EITC from the model. These alternative results are available from the authors.

We control for the influence of political heterogeneity in the state legislature and the political affiliation of the governor. These controls help capture the variance and dynamics of political differences across states. Finally, we controlled for year effects using annual *year dummies*. In some models, we also include *state dummies* to control for state fixed effects, which

may not be captured by other control variables. In many cases, we specified models with state fixed effects alongside models without state fixed effects to check for consistency of our estimates.

In the post-hoc analysis of the effects of EITC on entrepreneurial activity, we included public policy and labor market controls, which could have a bearing on specifications including the EITC. First, we control for the effect of welfare policies (i.e. the Aid to Families with Dependent Children benefit or its replacement, the Temporary Aid to Need Families benefit, AFDC-TANF) for a three-person family. Second, we control for the state unemployment rate. Third, we control for college-educated rate in the state, which determines the proportion of state that have a college education. Fourth, we control for the gross state product. In addition, we controlled for year effects and state fixed effects.

[INSERT TABLES 1 AND 2 ABOUT HERE]

Empirical Analyses

In selecting a model for our empirical analyses, we considered the need to account for multiple observations for each state in our sample, as well as accounting for a high degree of autocorrelation between one year in our period and the previous year (Marquis and Huang, 2009). Our model also needs to account for state-specific factors that we are unable to assess but that can also affect growth in the outcome variables of interest (Khaire, 2010). One fixed effects option for this sort of scenario is the Feasible Generalized Least Squares method (FGLS, i.e. xtgls in STATA). Since our dataset has 50 panels (N) and 18 time periods (T), we ruled out using the FGLS (xtgls). Beck and Katz (1995) demonstrate that when $T < N$, FGLS tends to produce extremely overconfident standard errors in finite sample analyses such as this study's.

Guided by prior literature, we selected the Ordinary Least Squares (OLS) regression with panel-corrected standard errors (PCSE, xtpcse in STATA) (Blackwell, 2005). This technique

employs the Prais-Winston regression with a panel-specific autoregressive disturbance structure (PCSE, xtpcse command in STATA). Specifically, the approach entails a Generalized Least Squares (GLS) estimator corrected for first-order serially correlated residuals that are panel specific (Marquis and Huang, 2009). Previous tests of this model show that it performs well, even under conditions of high heteroscedasticity and contemporaneous correlation of error terms (Beck and Katz, 1995); which was an issue of concern in our model specifications. We use a one-year lag between our independent and dependent variables because we expect the effects of inequality would take some time to manifest into entrepreneurial activity. Similarly, we expect a similar lag between entrepreneurial activity and poverty alleviation because the time interval between entrepreneurs starting their businesses and generating impact in society is likely to take at least one year. Nevertheless, in robustness checks, we considered two lags between the independent and dependent variables. The results using an additional lag are very consistent with the results using one-year lag.

In addition to our primary empirical specifications, we also conducted some tests to check for reverse causality in our models. Though we theorized that inequality will have a positive impact on entrepreneurial activity, some scholars have argued that entrepreneurial activity can lead to inequality (e.g. Atems and Shand, 2018). Therefore, this reverse causality was checked. Similarly, we advanced the hypothesis that entrepreneurial activity will alleviate poverty and that there is a hierarchy in the effects of entrepreneurial activity on poverty alleviation. We need to examine the possibility that absolute poverty could lead to more entrepreneurial activity. Thus we used the Granger causality method to check for reverse causality.

Results

Main Results

Table 1 includes the descriptive statistics and the correlation matrix for all the variables in this study. The average state in a given year in our study had 1.73 *firm-centric entrepreneurs* (1.73 new firms per 1000 people in the state), 0.80 *opportunity centric entrepreneurs* (80% of entrepreneurial activity that is focused on opportunity) and a 0.003 *rate of new entrepreneurs*. Correlations greater than or equal to the absolute value of 0.07 and 0.1 are statistically significant at ($p < 0.05$) and ($p < 0.01$) levels respectively. Interestingly, while *firm-centric entrepreneurial activity* is highly correlated with *opportunity-centric entrepreneurial activity* ($r = 0.30$) and *rate of new entrepreneurs* ($r = 0.39$); *opportunity-centric entrepreneurial activity* and *rate of entrepreneurs* are scarcely correlated with each other ($r = 0.00$). As indicated in the previous discussion of the factor analysis (and in the shaded area of Table 1), all measures of inequality used in developing the factor variable are highly correlated with each other, and with the factor variable ($0.60 < r < 0.98$).

The study's primary regressions are presented in Tables 2, 3 and 4. Table 2 shows the results of how *inequality* influences three measures of entrepreneurial activity. For each measure of entrepreneurial activity, we report a model that does not include state fixed effects and a model that includes state fixed effects to check for the sensitivity of our results to unobservable state-level factors. Hypothesis 1 predicts that states with higher levels of inequality will subsequently have higher rates of entrepreneurial activity. Models 1 and 2 test this hypothesis relative to the *firm-centric entrepreneurial activity*. Models 1 and 2 are identical, with the exception that model 2 includes state fixed effects (in addition to the explanatory variable, prior entrepreneurial activity, control variables, and year fixed effects contained in model 1). Both models support hypothesis 1, and indicate that the coefficient of *inequality* relative to *firm-centric entrepreneurial activity* is

positive and statistically significant at the ($p < 0.01$) level. The economic significance is such that a 1-standard deviation increase in inequality gives rise to a 0.5% (Model 1) to 2.7% (Model 2) increase in firm-centric entrepreneurial activity relative to the average level over the sample. Models 3 and 4, shown in Table 2, test hypothesis 1 based on the effect of *inequality* on *opportunity-centric entrepreneurial activity*. Similar to models 1 and 2, models 3 and 4 are identical except for the inclusion of state fixed effects in model 4. The coefficient of *inequality* in model 3 is negative and insignificant (contrary to our predictions). However, the coefficient of *inequality* in model 4, as predicted in positive and statistically significant ($p < 0.01$), and the economic significance is such that a 1-standard deviation increase in *inequality* gives rise to a 1.7% increase in *opportunity-centric entrepreneurial activity* relative to the average level over the sample. Finally, models 5 and 6 report the results of the tests of hypothesis 1 relative to the effect of *inequality* on the *rate of new entrepreneurs* in the state. Whereas the coefficient of *inequality* in model 5 (which does not include state fixed effects) is positive and marginally significant ($p < 0.1$), it still positive but insignificant in model 6 (a model which includes state fixed effects). The economic significance in model 5 is such that a 1-standard deviation increase in inequality gives rise to a 0.7% increase in the *rate of new entrepreneurs* in the state relative to the average level over the sample.

[INSERT TABLES 3 AND 4 ABOUT HERE]

Tables 3 and 4 show the results of the regressions test of hypothesis 2a and 2b respectively. Hypothesis 2 suggests a hierarchy wherein *firm-centric entrepreneurial activity* (H2a) and *opportunity-centric entrepreneurial activity* (2b) will have a higher impact than *self-employment rates* on poverty alleviation. To assess this hypothesis, we compare the coefficients

of entrepreneurial activity in model 7 and model 11, and between model 8 and model 12 respectively. We find statistical support for hypothesis 2a. The coefficient of *firm-centric entrepreneurs* when regressed on poverty rates is negative and statistically significant in models 7 ($p < 0.01$), and 8 ($p < 0.05$), where the economic significance is such that a 1-standard deviation increase in firm-centric entrepreneurs gives rise to a 1.0% to 4.6% reduction in poverty in models 8 and 9, respectively. The coefficient of *rate of new entrepreneurs* (a measure of *self-employment*) is not significant in Model 11, but positive and statistically significant in Model 12 ($p < 0.05$), whereby a 1-standard deviation increase in *rate of new entrepreneurs* gives rise to a 1.86% increase in poverty. Although this confirms our reasoning that *firm-centric entrepreneurial activity* will alleviate poverty at a greater rate than *self-employment rates*, we are surprised that controlling for unobservable factors model 12 shows a positive effect of *rate of new entrepreneurs* on *poverty*. That is, *self-employment rates* in a state could actually contribute to *poverty*. We return to this observation in our robustness tests using *food insecurity* as an alternative measure of poverty.

In the entrepreneurial activity hierarchy we proposed, we also posited that *opportunity-centric entrepreneurial activity* will have a greater impact on poverty alleviation that *self-employment*. We directly assess this hypothesis by considering the direction and statistical significance of *opportunity-centric entrepreneurs* in model 9 and 10. Recall that this measure is a proportional measure which represents the share of entrepreneurial activity in a state at a given time period that is focused on the pursuit of opportunity. Although the coefficient of *opportunity-centric entrepreneurs* is negative, as hypothesized, in model 9; it is not statistically significant. However, when controlling for state fixed-effects in model 10, the coefficient was still negative but now significant ($p < 0.05$) , whereby a 1-standard deviation increase in *rate of*

new entrepreneurs yielded a 1.0% reduction in poverty. Thus, the data indicates preliminary statistical support for hypothesis 2b regarding poverty reduction. We explore this further in the robustness tests documented in Table 4, where we use food insecurity in the states as an alternative dependent variable for poverty. As shown in Table 1, poverty rates are highly correlated to food insecurity rates ($r = 0.51$).

The results in Table 4 lend more support to hypotheses 2a and 2b. For hypothesis 2a, the coefficient of *firm-centric entrepreneurs* in model 13 is negative, and marginally significant ($p < 0.1$) when compared to the coefficient of *rate of new entrepreneurs* in model 17, which is positive and marginally significant ($p < 0.1$). Furthermore, after controlling for state fixed effects, the coefficient of the *firm-centric entrepreneurs* (as shown in model 14) is negative and marginally significant ($p < 0.1$) when compared to the coefficient of *self-employment* in model 18, which is positive and not significant. For hypothesis 2b, we find full support since the coefficient of *opportunity-centric entrepreneurs* is negative and statistically significant ($p < 0.5$) in both models 15 and 16 of Table 4.

Granger Causality Results

The results of the Granger causality tests are reported in Tables 5 and 6 below. As indicated previously, we checked for the possibility that poverty will directly lead to entrepreneurial activity of different forms. Table 5 presents the results of regressions with different forms of entrepreneurial activity as the dependent variable, and lagged values of these forms of entrepreneurial activity, as well as measures of poverty and food insecurity on the right-hand side of the equation. Since the *poverty* was not significant in models 19, 20 and 21, we were able to rule out reverse causality between poverty and different forms of entrepreneurial activity. This finding is consistent with the view that *relative* rather than absolute poverty is more important is

determining entrepreneurial activity in societies (Banerjee and Newman, 1994) but contrary to the findings in Atems and Shand (2018). For robustness, we check the *food insecurity* measures as well. The results in models 23-24 indicate that *food insecurity* measures are insignificant in predicting *opportunity-centric entrepreneurial activity* and *rate of new entrepreneurs*. However, we did find a negative and statistically significant predicting relationship between *food insecurity* and *firm-centric entrepreneurs* in a state ($p < 0.01$). In essence, this suggests that extremely high rates of food insecurity (or poverty) may substantially reduce the tendency for people to pursue *firm-centric entrepreneurial activity*, which in turn reinforces food insecurity. This cycle has been identified in prior literature as the poverty trap (Banerjee and Newman, 1994), and may have implications for poverty eradication.

Table 6 reports the results of Granger causality tests where inequality is the dependent variable, and lagged forms of inequality and different forms of entrepreneurial activity are included as the right-hand side predictor variables. We found no evidence that *firm-centric entrepreneurial activity* reverse causes inequality or that self-employment reverse causes inequality. However, the tests indicate that *opportunity-centric entrepreneurs* has a negative and statistically significant effect on inequality in the next time period ($p <0.01$), though this effect disappears after two time periods, as shown in model 28 of Table 6. This observation is not an issue with our model because it does not disprove the original thesis that inequality leads to entrepreneurial activity. However, it does shed some light on the earlier weak support for the hypothesis that inequality will lead to *opportunity-centric entrepreneurial activity*.

[INSERT TABLES 5 AND 6 ABOUT HERE]

Post-hoc Analysis and Robustness Checks

In post hoc checks, we assess the possibility that antipoverty policy will have an impact on entrepreneurial activity, especially *firm-centric* and *opportunity-centric* types of activity. Specifically, we evaluate the potential that EITC discourages entrepreneurial activity. The results reported in Table 7 provide initial evidence that EITC discourages entrepreneurial activity, though the statistical significance is greater for the *firm-centric entrepreneurial activity* than for the *opportunity-centric activity*.

In the course of our empirical checks, we considered many alternative models with different right-hand-side variables and different variable definitions. These checks include, but are not limited to, controls for differences in state regulation, subsets of different time periods, among other things. Moreover, we considered different clustering of standard errors and other econometric specifications including a two-year lag of the dependent variables. We did not find other specifications that suggested any insignificance or reversal of the major findings reported above. Alternative specifications are available on request from the authors.

[INSERT TABLE 7 ABOUT HERE]

Future Research

Our study suggests some important directions for management and organizational research. In particular, we show that scholars should account for differences between the form and focus of entrepreneurial activity when investigating different research questions. In addition, we believe that these initial insights suggest some useful avenues for future research that aims to understand how economic and social structure shape egotistic and ethical incentives to undertake entrepreneurial action. These findings also hold important implications for public policy. For

example, the results seem to underscore the need for public policy makers to consider a more targeted and nuanced approach towards encouraging entrepreneurial activity, with a view towards the interplay between inequality and poverty and entrepreneurial activity.

We have introduced a few different types of entrepreneurial activity, and a few different types of poverty. Both poverty and entrepreneurship are themselves complicated and multifaceted concepts, and there are other types of breakdowns of these concepts through which links could be explored in other work. Our analyses here are somewhat coarse, partly necessitated by the fact that we introduced a new theoretical look under the surface at the links between different types of entrepreneurship and poverty, and provided a new empirical analysis. We hope further research will uncover other insights both theoretically and empirically that link different elements of entrepreneurship to different elements of poverty.

While our theory and evidence focused on the economic motives linking inequality and entrepreneurship, further research on different types of entrepreneurship and different types of poverty could instead focus on the psychological side of the equation. A recent discussion of the connection between psychology and entrepreneurship (Wiklund et al., 2019) offers insights as to how different aspects of fulfillment, reliance, and optimism might be at play in some contexts, there is certainly scope for discouragement to be a dominant factor in other institutional settings. How and when these different psychological forces work is beyond the scope of our paper, but could prove to be insightful for understanding the link between poverty and entrepreneurship in different regional settings.

While our evidence is focused on the U.S., where there is significant inequality across states and over time (Beal and Asktakhova, 2017), further research could likewise examine other countries, as well as policy initiatives that affect poverty, and the intersection of inequality and

poverty and entrepreneurial activity with regard to institutional considerations (Cullen et al., 2014; Dam et al., 2014; Yu, Hao, Ahlstrom, Si, and Liang, 2014). Countries with numerous policy initiatives toward entrepreneurship such as in China (Ahlstrom and Ding, 2014) can be of particular interest with respect to this research domain (Cumming, Hou, Lee, and Firth, 2015). Finally, our evidence is consistent with the view that public policy efforts directed toward entrepreneurial activity should not be made separately from public policy efforts directed toward poverty, as these initiatives will affect one another in the real economy, even in advanced nations such as the U.S.

Conclusion

This study has provided theory and evidence that income inequality actually has the potential to cause additionalentrepreneurial aactivity in a country in the form of *firm-centric* and *opportunity-centric* actions. In addition, we provided supporting theory and evidence that entrepreneurial activity focused on firms and opportunities are generally more productive and effective in poverty alleviation in society when compared to self-employment, consistent with our entrepreneurial activity hierarchy (EAH) proposition (cf. Chen, Chang, and Bruton, 2017). This lends credence to the potential spillover effects of entrepreneurial activity based on high aspirations (Chivers, 2017). Furthermore, the evidence provided is consistent with the view that self-employment (at its early stages) may not be a suitable proxy for understanding entrepreneurial activity, especially that with more growth potential (Bruton, Ahlstrom, and Obloj, 2008; Haltiwanger, Jarmin, and Miranda, 2013).To our knowledge, our study is one of the first studies to take a deeper look at the complex relationship between inequality and entrepreneurial activity, and in conjunction with the relationship between entrepreneurial activity

and absolute poverty alleviation. Thus, we overcome key limitations in prior empirical work (e.g. Atems and Shand, 2018; Nikolaev et al., 2018) by offering a more granular analysis, which delineates the causal links between the different concepts of entrepreneurship and poverty.

Moreover, beyond establishing the causal links between entrepreneurship and poverty reduction, this paper has further demonstrated the role of anti-poverty policy on entrepreneurship rates. Specifically, thet findings indicate that EITC anti-poverty policyactually reduces incentives for entrepreneurial activity, especially the type of entrepreneurial activity that alleviates poverty. Though much previous entrepreneurship research has acknowledged the direct role of public policy efforts aimed at encouraging entrepreneurship and better understanding job growth (e.g. Benzing et al., 2009; Haltiwanger, 2015), the current study adds to the literature by providing initial evidence of the indirect role of anti-poverty policy and related measures on entrepreneurial activity and the subsequent effects on entrepreneurship on poverty reduction.

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TABLE 1
Summary Statistics and Bivariate Correlations among the Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Firm-Centric Entrepreneurs	1.00																			
2. Opportunity-Centric Entre.	0.30	1.00																		
3. Rate of New Entrepreneurs	0.39	0.00	1.00																	
4. Poverty Rate	-0.32	-0.22	0.24	1.00																
5. Food Insecurity	-0.36	-0.29	0.32	0.51	1.00															
6. Inequality	0.15	-0.15	0.04	0.02	0.07	1.00														
7. Gini Coefficient	0.07	-0.14	0.31	0.32	0.36	0.71	1.00													
8. Relative Mean Deviation	0.05	-0.22	0.19	0.16	0.23	0.94	0.81	1.00												
9. Theil Entropy	0.20	-0.10	0.01	-0.05	0.02	0.97	0.62	0.88	1.00											
10. Atkinson Index	0.17	-0.12	0.01	-0.08	-0.03	0.97	0.61	0.90	0.97	1.00										
11. Top 10% Income Share	0.03	-0.23	-0.07	0.11	0.12	0.91	0.63	0.81	0.83	0.83	1.00									
12. Top 1% Income Share	0.21	-0.09	-0.02	-0.04	0.00	0.96	0.64	0.83	0.92	0.91	0.93	1.00								
13. ln (EITC max. credit)	-0.40	-0.33	-0.05	0.05	0.36	0.29	0.28	0.40	0.23	0.31	0.26	0.19	1.00							
14. ln (AFDCTANF benefit)	-0.12	-0.18	0.09	-0.31	0.08	0.18	0.10	0.26	0.17	0.23	0.07	0.10	0.55	1.00						
15. Minimum Wage	-0.43	-0.35	0.05	0.13	0.54	0.30	0.31	0.45	0.24	0.28	0.29	0.19	0.76	0.62	1.00					
16. Governor is Democrat	-0.07	-0.08	-0.07	-0.07	0.03	-0.05	-0.10	-0.07	-0.07	-0.04	0.00	-0.04	0.11	0.09	0.12	1.00				
17. Legislative Diversity	0.00	0.04	0.09	0.02	0.04	0.02	0.05	0.02	-0.02	0.01	0.07	0.03	-0.12	-0.21	-0.10	0.12	1.00			
18. Unemployment Rate	-0.50	-0.48	0.08	0.48	0.58	0.12	0.28	0.30	0.05	0.04	0.21	0.01	0.45	0.26	0.62	0.06	0.02	1.00		
19. Gross State prod./capita	-0.16	-0.15	-0.07	0.07	0.01	0.47	0.26	0.51	0.49	0.54	0.30	0.36	0.53	0.39	0.48	0.12	-0.06	0.26	1.00	
20. College Educated Rate	0.03	-0.18	-0.10	-0.28	-0.17	0.43	0.07	0.42	0.45	0.52	0.33	0.32	0.55	0.51	0.42	0.09	-0.06	0.09	0.70	1.00
Mean	1.73	0.80	0.003	0.12	0.04	0.00	0.59	0.83	0.81	0.28	43.47	17.34	8.44	6.68	6.10	0.44	0.45	5.62	0.04	0.17
S.D.	0.46	0.06	0.0008	0.03	0.01	1.00	0.04	0.05	0.20	0.04	4.88	4.40	0.17	0.22	1.09	0.50	0.07	2.02	0.02	0.04
Min	0.74	0.56	0.00	0.05	0.01	-1.64	0.52	0.74	0.44	0.21	33.40	9.70	8.18	6.07	4.25	0.00	0.16	2.30	0.02	0.09
Max	3.39	0.95	0.01	0.25	0.08	5.81	0.76	1.12	2.58	0.53	62.26	36.04	8.93	7.35	9.19	1.00	0.50	13.80	0.18	0.34

All bivariate correlations greater than or equals to the absolute value of 0.07 and 0.1 are significant at the 5% and 1% levels respectively. All tests are two-tailed. Shaded area indicates the bivariate correlations between different inequality measures (including their correlations with the composite measure of inequality).

TABLE 2

Effects of Income Inequality on Entrepreneurial Activity

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	Firm-Centric $_{(t+1)}$		Opportunity-Centric $_{(t+1)}$		Rate of New Entre $_{(t+1)}$	
Inequality	**0.00912****	**0.04634****	-0.00036	**0.01362****	**0.00002+**	0.00005
	[0.00283]	**[0.01531]**	[0.00135]	**[0.00462]**	**[0.00001]**	[0.00004]
Firm-Centric Entrepreneurs$_{(t)}$	0.95991***	0.66192***				
	[0.02435]	[0.07681]				
Opportunity-Centric Entrepreneurs $_{(t)}$			0.71044***	0.60001***		
			[0.05555]	[0.06755]		
Rate of New Entrepreneurs $_{(t)}$					0.89468***	0.64125***
					[0.02846]	[0.06353]
Minimum Wage	-0.00597	**-0.01924***	**-0.00448+**	0.00048	0.00000	0.00004
	[0.00521]	**[0.00751]**	**[0.00238]**	[0.00465]	[0.00002]	[0.00003]
Governor is Democrat	0.00317	0.00818	-0.00019	-0.00396	-0.00001	0.00001
	[0.00536]	[0.00580]	[0.00358]	[0.00460]	[0.00002]	[0.00003]
Legislative Diversity	-0.02865	-0.14625	-0.02400	0.01013	-0.00016	0.00016
	[0.04122]	[0.10437]	[0.03026]	[0.05343]	[0.00019]	[0.00045]
Constant	0.12149**	0.77302***	0.28369***	0.29191***	0.00032+	0.00091*
	[0.04588]	[0.15853]	[0.05248]	[0.07026]	[0.00019]	[0.00039]
Year Dummies	YES	YES	YES	YES	YES	YES
State Dummies	NO	YES	NO	YES	NO	YES
Observations	784	784	735	735	735	735
R-squared	0.985	0.987	0.971	0.974	0.932	0.945
Number of state	49	49	49	49	49	49
Chi-squared	159465***	1.940e+07***	6452***	774207***	2062***	1.707e+06***

The table reports parameter coefficient estimates. Panel-corrected standard errors are in parentheses. *** p<0.001, ** p<0.01, * p<0.05, + p<0.1 indicate significance, using two-tailed tests.

TABLE 3
The Effects of Entrepreneurial Activity on Poverty Alleviation

	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
	Poverty $_{(t+1)}$	Poverty $_{(t+1)}$	Poverty $_{(t+1)}$	Poverty $_{(t+1)}$	Poverty $_{(t+1)}$	Poverty $_{(t+1)}$
Firm-Centric Entrepreneurs $_{(t)}$	**-0.00272****	**-0.01191***				
	[0.00102]	**[0.00488]**				
Opportunity-Centric Entrepreneurs $_{(t)}$			-0.00532	**-0.02029***		
			[0.00709]	**[0.00858]**		
Rate of New Entrepreneurs $_{(t)}$					-0.10145	**2.78984***
					[0.49559]	**[1.13626]**
Poverty $_{(t)}$	0.89259***	0.30819***	0.92288***	0.33391***	0.92516***	0.32295***
	[0.02434]	[0.07148]	[0.02253]	[0.07866]	[0.02390]	[0.07987]
Minimum Wage	-0.00240**	-0.00163	-0.00218***	-0.00101	-0.00207**	-0.00122
	[0.00086]	[0.00104]	[0.00063]	[0.00092]	[0.00064]	[0.00094]
Governor is Democrat	-0.00019	-0.00133	-0.00009	-0.00225+	-0.00007	-0.00204
	[0.00102]	[0.00119]	[0.00106]	[0.00124]	[0.00110]	[0.00128]
Legislative Diversity	0.00376	-0.02155	0.00163	-0.04082*	0.00125	-0.04212*
	[0.00902]	[0.01629]	[0.00852]	[0.01702]	[0.00884]	[0.01773]
Constant	0.02646**	0.15278***	0.03041***	0.16254***	0.02573***	0.14159***
	[0.00888]	[0.02035]	[0.00908]	[0.01998]	[0.00747]	[0.01889]
Year Dummies	YES	YES	YES	YES	YES	YES
State Dummies	NO	YES	NO	YES	NO	YES
Observations	784	784	686	686	686	686
R-squared	0.943	0.948	0.954	0.963	0.953	0.961
Number of state	49	49	49	49	49	49
Chi-squared	13077***	2.830e+08***	15093***	2.035e+06***	15507***	7.864e+06***

The table reports parameter coefficient estimates. Panel-corrected standard errors are in parentheses. *** p<0.001, ** p<0.01, * p<0.05, + p<0.1 indicate significance, using two-tailed tests.

TABLE 4
Effect of Entrepreneurial Activity on Food Insecurity

	Model 13	Model 14	Model 15	Model 16	Model 17	Model 18
	Dependent Variable (DV): Food Insecurity $_{(t+1)}$					
Firm-Centric Entrepreneurs $_{(t)}$	**-0.00095+**	**-0.00226+**				
	[0.00049]	**[0.00128]**				
Opportunity-Centric Entrepreneurs $_{(t)}$			**-0.00625***	**-0.00889***		
			[0.00285]	**[0.00380]**		
Rate of New Entrepreneurs $_{(t)}$					**0.42590+**	0.65933
					[0.25314]	[0.43768]
Food Insecurity $_{(t)}$	0.85203***	0.62682***	0.84570***	0.62371***	0.83798***	0.61987***
	[0.04798]	[0.08540]	[0.04934]	[0.08682]	[0.05307]	[0.08794]
Minimum Wage	0.00049	0.00203**	0.00032	0.00213***	0.00035	0.00209***
	[0.00062]	[0.00063]	[0.00062]	[0.00064]	[0.00063]	[0.00063]
Governor is Democrat	-0.00067+	-0.00019	-0.00062	-0.00033	-0.00046	-0.00017
	[0.00040]	[0.00041]	[0.00039]	[0.00044]	[0.00039]	[0.00042]
Legislative Diversity	0.00431	-0.00061	0.00481	0.00015	0.00382	-0.00134
	[0.00418]	[0.00625]	[0.00425]	[0.00650]	[0.00421]	[0.00643]
Constant	0.00584	0.01396+	0.01072+	0.01716*	0.00522	0.00929
	[0.00522]	[0.00768]	[0.00577]	[0.00782]	[0.00522]	[0.00779]
Year Dummies	YES	YES	YES	YES	YES	YES
State Dummies	NO	YES	NO	YES	NO	YES
Observations	539	539	539	539	539	539
R-squared	0.925	0.939	0.925	0.940	0.923	0.939
Number of state	49	49	49	49	49	49
Chi-squared	60754***	475237***	82867***	1.392e+06***	68335***	1.881e+06***

The table reports parameter coefficient estimates. Panel-corrected standard errors are in parentheses. *** p<0.001, ** p<0.01, * p<0.05, + p<0.1 indicate significance, using two-tailed tests.

Table 5
Granger Causality Tests of Entrepreneurial Activity

	Model 19 Firm-Centric (t+1)	Model 20 Opportunity-Centric (t+1)	Model 21 Rate of New Entre (t+1)	Model 22 Firm-Centric (t+1)	Model 23 Opportunity-Centric (t+1)	Model 24 Rate of New Entre (t+1)
Firm-Centric Entrepreneurs (t)	0.94383***			0.88967***		
	[0.04486]			[0.05987]		
Opportunity-Centric Entrepreneurs (t)		0.72305***			0.65754***	
		[0.05880]			[0.06672]	
Rate of New Entrepreneurs (t)			0.87574***			0.89168***
			[0.02937]			[0.03577]
Poverty (t)	0.04202	-0.05795	0.00038			
	[0.26064]	[0.04653]	[0.00045]			
Food Insecurity (t)				-4.32142**	-0.30294	0.00049
				[1.67763]	[0.19133]	[0.00131]
Constant	0.05175	0.22687***	0.00030**	0.33658**	0.27956***	0.00030**
	[0.08010]	[0.04767]	[0.00010]	[0.11063]	[0.05657]	[0.00011]
Observations	800	750	750	550	600	600
R-squared	0.937	0.957	0.928	0.927	0.966	0.934
Number of state	50	50	50	50	50	50
Chi-squared	452.1***	154.4***	903.7***	227.8***	130.0***	621.6***

The table reports parameter coefficient estimates. Panel-corrected standard errors are in parentheses. *** p<0.001, ** p<0.01, * p<0.05, + p<0.1 indicate significance, using two-tailed tests.

Table 6
Granger Causality Tests with Inequality as the Dependent Variable

	Model 25 Inequality $_{(t+1)}$	Model 26 Inequality $_{(t+2)}$	Model 27 Inequality $_{(t+1)}$	Model 28 Inequality $_{(t+2)}$	Model 29 Inequality $_{(t+1)}$	Model 30 Inequality $_{(t+2)}$
Inequality $_{(t+1)}$		1.16523***		1.14091***		1.14583***
		[0.18030]		[0.20048]		[0.20026]
Inequality $_{(t)}$	0.94281***	-0.20851	0.94428***	-0.20789	0.94831***	-0.21180
	[0.05541]	[0.18391]	[0.05218]	[0.20160]	[0.05258]	[0.20168]
Firm-Centric Entrepreneurs $_{(t)}$	0.02156	-0.07816				
	[0.10215]	[0.08417]				
Opportunity-Centric Entrepreneurs $_{(t)}$			**-1.56503****	-0.24968		
			[0.58373]	[0.49006]		
Rate of New Entrepreneurs $_{(t)}$					-9.88966	-15.19449
					[27.87295]	[27.20107]
Constant	0.06303	0.22354	1.35745**	0.27986	0.12060	0.12526
	[0.18399]	[0.15761]	[0.47681]	[0.39935]	[0.13859]	[0.13052]
Observations	800	750	700	650	700	650
R-squared	0.815	0.853	0.824	0.846	0.818	0.845
Number of state	50	50	50	50	50	50
Chi-squared	331.6***	462.2***	348.6***	356.5***	342.9***	385.5***

The table reports parameter coefficient estimates. Panel-corrected standard errors are in parentheses. *** p<0.001, ** p<0.01, * p<0.05, + p<0.1 indicate significance, using two-tailed tests.

APPENDIX A:

TABLE 7
Effects of EITC Maximum Credit on Firm-Centric and Opportunity-Centric Entrepreneurs

	Model A1	Model A2	Model A3	Model A4	Model A5	Model A6
	Firm-Centric$_{(t+1)}$	Firm-Centric$_{(t+2)}$	Firm-Centric$_{(t+3)}$	Opportunity-Centric$_{(t+1)}$	Opportunity-Centric$_{(t+2)}$	Opportunity-Centric$_{(t+3)}$
ln (EITC max. credit)	**-1.051*** **	**-0.888*** **	**-0.540*** **	-0.068	**-0.089***	**-0.107***
	[0.133]	[0.132]	[0.128]	[0.064]	[0.043]	[0.046]
ln (AFDCTANF benefit)	-0.434**	-0.403**	-0.475***	-0.125**	0.022	0.052
	[0.135]	[0.129]	[0.143]	[0.044]	[0.047]	[0.045]
State unemployment rate	-0.035***	-0.022**	-0.020*	-0.013***	-0.012***	-0.009***
	[0.008]	[0.009]	[0.009]	[0.003]	[0.003]	[0.003]
College educated rate	-0.458	0.311	-0.458	0.030	0.247	-0.079
	[0.453]	[0.466]	[0.461]	[0.164]	[0.162]	[0.163]
Gross state product per capita	-3.121	-7.113*	-8.158**	1.241	0.582	1.137
	[3.102]	[2.882]	[3.111]	[0.909]	[0.776]	[0.835]
Constant	13.481***	11.907***	9.516***	2.193***	1.390***	1.380***
	[1.255]	[1.200]	[1.160]	[0.661]	[0.406]	[0.411]
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	750	750	700	700	750	750
R-squared	0.973	0.973	0.971	0.964	0.960	0.959
Number of states	50	50	50	50	50	50

The table reports parameter coefficient estimates. Panel-corrected standard errors are in parentheses. *** p<0.001, ** p<0.01, * p<0.05, + p<0.1 indicate significance, using two-tailed tests. The EITC maximum credit (which a measure of the generosity of the EITC for each state) is calculated for a family with two dependents, and it includes both the federal and state credits. Results are consistent when we used EITC maximum credit for a family of one dependent. Sub-sample results are consistent across one or two lags between the dependent variables and the independent variables.