

## **EXAMINING THE MEDIATED RELATIONSHIP BETWEEN BUSINESS ESTABLISHMENTS AND CRIME**

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### **ABSTRACT**

Although the impact of crime on small business activity is well documented and accepted, concentrating on how crime drives down profits, causing entrepreneurs to shy away from taking risks that could lead to prosperity. However, another perspective may exist linked to the fact that small businesses can create more jobs more quickly than large corporations, and in the process may help to retard crimes against people, property, and society. This study investigates this alternative, using lagged time series hierarchical regression to determine the impact of small business activity on different types of crime and the relationship between the number of business establishments and crime mediated by the number of paid employees.

### **RELEVANT LITERATURE**

The relationship between crime and economic cycles is well documented, and the effect on business, especially small business, is severe. However, little attention is paid to the possibility that small business activity may impact levels of crime not of a business nature. Business startups may influence unemployment levels, contributing to economic growth (Rosenof, 1997). Research indicates that an increase in entrepreneurial activity exerts a negative force on unemployment (Thurik & Verheul, 2002; Praag & Versloot, 2007), and crime levels can decline as unemployment falls (Levitt, 2004). Highly educated individuals with more developed skills and abilities are more likely to be entrepreneurially inclined, creating their own jobs by starting businesses (Koellinger, P. (2008). It can be inferred that as entrepreneurs start and grow new businesses, new jobs are created (Birch, 1979), employees are hired, unemployment effects decrease, economic activity expands, and crime contracts. SMEs can be more flexible than large corporations, and this flexibility may translate into faster growth (Julian, 1993), while smaller firms advance more rapidly (Shaffer, 2002, Gray, 2000).

Research focuses on the relationship between crime and unemployment effects (Gould, Weinberg, and Mustard, 2002), and the negative impact of crime on business success (Bressler, 2011; Chickowski, 2010; Elms, 2008). Illegal activity increases, when the opportunity cost of crime declines (Ehrlich, 1973), but inconsistent study results blur other relationships between crime and unemployment. Still, identifiable results include studies showing unemployment significantly affects property crime in states with higher union membership (Lin, 2008), and crime in areas with casino operations increases over time (Grinols & Mustard, 2006). Also, European studies addressing the unemployment / crime relationship find connections to non-violent crime. Higher youth unemployment is positively associated with crime (Fougere, Kramarz, & Pouget, 2009), and Nilsson & Agell (2003) found evidence of effective labor market programs targeting youths. At the local level, BIDs - Business Improvement Districts (International Downtown Association, 2007) introduced the concept of partnering among

public, private, and civic groups to restore safe areas for citizens (Mitchell, 2008). BIDs are working to create a fertile atmosphere for business (Grossman, 2008).

Lin (2008) questions the lack of control variables in data reporting in crime / unemployment data and the reliability of unemployment as a variable also is suspect (Grogger, 1998; Gould, Weinberg, and Mustard, 2002). Grogger (1998) and Gould, Weinberg, and Mustard, (2002) contend that wages relate more realistically crime than unemployment.

Economic cycles and crime combine (Short, 1980) to influence business activity and performance (Levisohn, 2009). Internal crime can be committed by an employee of the business, such as embezzlement or it can be external, committed by someone outside of the business, as in the case of theft (Arvanites & Defina, 2006). The costs to businesses are staggering, driving some businesses to the point of insolvency (Bressler, 2011). The growing incidence of internal or external cyber crimes and the associated costs seriously impact firm profitability (Crime in the United States, 2007) giving cyber crime the potential to be the most costly of all business crimes (Elms, 2008), nationally exceeding one trillion dollars (Chikowski, 2010). Furthermore, internal criminals use legitimate businesses to defraud customers of the entity and its employees, evidenced by Enron and WorldCom (Schickel, 2005).

Small businesses are particularly vulnerable to crime, lacking large corporations' depth of resources. The cost of problem research and analysis is too high to bear, and the resulting lack of knowledge contributes to a low level of understanding of the nature and depth of the crime threat. With adequate knowledge and understanding absent, management may be unable to develop and implement strategies and tactics to combat the crime threat (Bougaart & Kyobe, 2011; Daigle, Morris, & Hayes, 2009). Forensic accounting audits indicate that internal controls often are not implemented (Glodstein, 2009). The safeguards that could offer a degree of protection to the businesses are not accessed by the business (Bressler, 2011; Ban, L. & Heng, G., 1996), even though the resources are available. Small business owners' negative experiences with law enforcement and the judicial system worsen this scenario. Crimes often go unreported and prosecuted, due to a lack of faith in enforcement (Daigle, Morris, & Hayes, 2009), distorting the severity of the problem (Bressler, 2011).

The hypotheses inquire as to the effect of small business activity on different types of crime: crimes against people, crimes against property, and crimes against society, considering the findings of Stone, Hamilton, and Wilbanks (2012) that entrepreneurial activity is a statistically significant negative predictor of crime. This study utilizes mediated hierarchical time-series regression analysis to refine the understanding of the relationship between entrepreneurial activities and crime, to determine whether a change in business activity relative to crime is mediated by a change in the number of paid employees.

## **HYPOTHESES**

H1: A mediated negative relationship exists between total business establishments and paid employees and total crime.

H2: A mediated negative relationship exists between total business establishments and paid employees and crimes against people.

H3: A mediated negative relationship exists between total business establishments and paid employees and crimes against crimes against property.

H4: A mediated negative relationship exists between total business establishments and paid employees and crimes against crimes against society.

## **METHODS**

## Data and Sample

The data for this sample were collected from the websites of the Arkansas Crime Information Center (<http://acic.org>) and the United States Census Bureau (<http://www.census.gov/econ/cbp/>). Data for business patterns were collected for counties in the state of Arkansas in terms of number of paid employees, and number of business establishments for the years 2004 through 2007. Crime statistics also were available and collected for 68 out of the 75 counties in the state of Arkansas in terms of crimes against people, crimes against property, and crimes against society for the years 2006 through 2007. Population data for each of the matching 68 counties in the study also were collected.

## Measures

The *dependent variables* for this study include crimes against people, crimes against property, crimes against society, and total crime, in order to determine the influence of entrepreneurial activity upon crime. These dependent variables were recorded for each of the 68 Arkansas counties for 2006 and 2007.

*Crimes against people.* This variable represents the reported occurrences of crimes such as murder, homicide, rape, assault, etc. per county. Data was collected for 2006 and 2007.

*Crimes against property.* This variable represents the reported occurrences of crimes such as arson, bribery, burglary, counterfeiting, fraud, theft, etc. per county and was collected for 2006 and 2007.

*Crimes against society.* This variable represents the reported occurrences of crimes such as illegal drug use or trafficking, prostitution, illegal gambling, weapons law violations, etc. per county and was collected for 2006 and 2007.

*Total crime.* This variable represents the total reported occurrences of all crimes within a county and was collected for years 2006 and 2007.

The *independent variables* for this study include the number of paid employees and the number of total establishments within each county, which have been found to predict crime (Stone, Hamilton, & Wilbanks, 2012). These independent variables were recorded for 2004, 2005, and 2006.

*Paid employees.* This variable represents the total number of paid employees within a given county and was collected for the years 2004 through 2006.

*Total establishments.* This variable represents the total number of businesses operating within a given county and was collected for the years 2004 through 2006.

The population of each county represents the *control variable* for this study. This variable is included to rule out the plausible rival hypothesis that the difference in crime by county is explained by population, and will assist in determining whether entrepreneurial activity explains fluctuations in crime levels beyond what is explained by population.

*Population.* This variable represents the total population of a given county and was collected for the years 2006 and 2007.

## Analysis

The data were analyzed utilizing descriptive statistics, correlation analysis, and lagged time series hierarchical regression (Cohen, Cohen, West, & Aiken, 2003). All relationships were tested using lagged time series hierarchical regression, controlling for the change in population. The mediated relationship between total establishments, paid employees, and each of the 4 dependent variables were tested, utilizing the Baron and Kenny (1986) method, the Sobel test, and the Preacher and Hayes (2008) mediated bootstrapping method.

While correlation analysis revealed that crime and entrepreneurial activity are positively related, this correlation should not be assumed to be causal. Stone and colleagues (2012) found that population is highly positively correlated with both crime and entrepreneurial activity and drives this relationship. Counties with larger populations have both more entrepreneurial activity and more crime. Further, they found that entrepreneurial activity during time 1 negatively predicted crime during time 2.

## RESULTS

In order to test the series of hypotheses predicting that the negative relationships between total establishments and the different categories of crime are mediated by the number of paid employees, the percent change in total establishments was entered into the regression equation first, after controlling for change in population. This resulted in significant negative relationships between total establishments at time 1 and crime at time 2. Then, when the percent change in paid employees at time 1 was added into the regression equation, the relationship between total establishments at time 1 and crime at time 2 became non-significant, indicating full mediation (Baron & Kenny, 1986). The lagged time series hierarchical regression results are displayed in Table 8 below.

**Table 8: Time Series Regression Analysis**

	Change in Crimes against People 2006-2007	Change in Crimes against Property 2006-2007	Change in Crimes against Society 2006-2007	Changes in Total Crime 2006-2007
Standardized Beta Coefficients				
<i>Control Variable</i>				
Population Change 2006-2007	.33**	.21*	.21*	.24*
<i>Independent Variables</i>				
%Change in Total Establishments 2004-2005 (When included without Paid Employees)	-16*	-16*	-17*	-17*
%Change in Paid Employees 2004-2005	-.20*	-.20*	-.22*	-.21*
%Change in Total Establishments 2004-2005 (When included with Paid Employees)	.00	.02	.03	.02
Adjusted R <sup>2</sup>	.10**	.11**	.11**	.11**

N=68, + indicates  $p < .10$ , \* indicates  $p < .05$ , \*\* indicates  $p < .01$

Hypothesis 1 predicted that a mediated negative relationship exists among total business establishments, paid employees, and total crime. The control variable of change in population from 2006-2007 was a significant positive predictor of change in total crime from 2006-2007 (coefficient = .24,  $p < .05$ , one tailed). The change in paid employees from 2004-2005 was a significant negative predictor of total crime (coefficient = -.21,  $p < .05$ , one tailed). Change in total establishments did not explain significant unique variance above that already explained by the change in population and change in paid employees.

The overall model which included both the control variable of population change and the predictor variables was significant ( $R^2 = .11, p < .05$ ). Thus, hypothesis 1 was supported.

Hypothesis 2 predicted that a mediated negative relationship exists among total business establishments, paid employees and crimes against people. The control variable of change in population from 2006-2007 was a significant positive predictor of change in crimes against people from 2006-2007 (coefficient = .33,  $p < .01$ , one tailed). The change in paid employees from 2004-2005 was a significant negative predictor of crimes against people (coefficient = -.20,  $p < .05$ , one tailed). Change in total establishments did not explain significant unique variance that already was explained by the change in population and change in paid employees. The overall model, which included both the control variable of population change and the predictor variables was significant ( $R^2 = .10, p < .05$ ). Thus, hypothesis 2 was supported.

Hypothesis 3 predicted that a mediated negative relationship exists among total business establishments, paid employees and crimes against property. The control variable of change in population from 2006-2007 was a significant positive predictor of change in crimes against property from 2006-2007 (coefficient = .21,  $p < .05$ , one tailed). The change in paid employees from 2004-2005 was a significant negative predictor of crimes against property (coefficient = -.20,  $p < .05$ , one tailed). Change in total establishments did not explain significant unique variance above that already explained by the change in population and change in paid employees. The overall model which included both the control variable of population change and the predictor was significant ( $R^2 = .11, p < .05$ ). Thus, hypothesis 3 was supported.

Hypothesis 4 predicted that a mediated negative relationship exists among total business establishments, paid employees and crimes against society. The control variable of change in population from 2006-2007 was a significant positive predictor of change in crimes against society from 2006-2007 (coefficient = .21,  $p < .05$ , one tailed). The change in paid employees from 2004-2005 was a significant negative predictor of crimes against society (coefficient = -.22,  $p < .05$ , one tailed). Change in total establishments did not explain significant unique variance above that already explained by the change in population and change in paid employees. The overall model which included both the control variable of population change and the predictor variables was significant ( $R^2 = .11, p < .05$ ). Thus, hypothesis 4 was supported.

Therefore, all of the hypotheses were supported when utilizing the Baron and Kenny (1986) method. When conducting a more conservative Sobel test however, the indirect effect of change in total business establishments upon change in total crime through change in paid employees is only marginally significant ( $p < .10$ ). However, Preacher and Hayes (2008), state that bootstrap confidence intervals are preferred over the Sobel test because of the unrealistic assumption the Sobel tests makes about the shape of the sampling distribution of the indirect effect. Therefore, structural equation modeling in Amos with bias corrected bootstrapping was utilized in order to further test for mediation. This resulted in an indirect effect beta of .05 along the path from change in total establishments through change in paid employees to change in total crime with a significant two tailed p-value of .012. Thus all of the hypotheses are supported when using the Preacher and Hayes (2008) structural equation modeling with bias corrected bootstrapping method as well.

## DISCUSSION

The use of lagged time series hierarchical regression was necessary to determine the true relationship between entrepreneurial activity and crime. Cross-sectional regression analysis utilizing entrepreneurial activity to predict crime would have resulted in a positive relationship, incorrectly indicating that more entrepreneurial activity leads to more crime. By studying the change in entrepreneurial activity in the time span preceding the change in crime over a later time span, it is concluded that entrepreneurial activity is in fact a negative predictor of crimes against people, property, and society. Therefore, the research suggests that an increase in small business activity over time may lead to a decrease in crime in a later span of time.

As predicted, a negative relationship exists between entrepreneurial activity and crime. Study results indicate that an increase in entrepreneurial activity precedes a decrease in three types of crime: 1) crimes against people, 2) crimes against property, 3) crimes against society. Policymakers may want to consider the possibility that increases in entrepreneurial activity may foster benefits beyond economic prosperity for entrepreneurs. By reducing legal and regulatory roadblocks to small business creation and maintenance, where possible, the resulting healthy small business climate also may help to make communities safer from crime.

### **LIMITATIONS and Future Directions for Research**

This exploratory research raises questions that point to suggestions for further research. First, the current sample size of 68 of 75 Arkansas counties, and the nature of that state imposes limitations on this research. Arkansas is a rural state, with few metropolitan areas. Results could vary across states with different demographic, geographic, and economic characteristics. Therefore, future research should sample a broader range of states; a region; or possibly all states. Also, investigating other dependent variables would be useful. If crime in the context of the general environment is affected by small business activity, other societal factors may be impacted as well.

### **REFERENCES AVAILABLE UPON REQUEST**