



Property crime, earnings variability, and the cost of capital



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ABSTRACT

We show that firms located in states where property crime is more prevalent have more uncertain earnings and higher financing costs. Specifically, firms located in states with higher property crime rates have more volatile and less persistent earnings as well as lower quality analysts' earnings forecasts. Firms located in states with higher property crime rates also have a higher cost of equity and debt capital. These results are robust to accounting for economic and endogeneity concerns in various ways. Overall, our results suggest that a potentially large and overlooked cost of crime is a higher cost of capital.

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1. Introduction

Understanding the costs of crime is of strong interest to policy makers and academics, as it helps guide how resources are allocated to programs that curtail criminal activity. While the annual aggregate cost of crime in the United States is substantial at approximately \$1.7 trillion (Anderson, 2012), firms also bear a considerable portion of crime-related costs and risks. For example, Cunningham et al. (1990) estimate that theft costs firms over \$100 billion a year. This finding suggests that the risk of theft-related losses represents a significant source of business risk for firms that can increase earnings uncertainty and make it more costly to raise capital. In this study, we test this implication by investigating whether firms located in areas where crime is more prevalent have more variable earnings and a higher cost of equity and debt capital.

Although prior evidence suggests that theft-related losses can be material for firms, there are reasons why it would not affect risk or financing costs. In particular, if firms are aware of the risk of theft-related losses, they could take actions to mitigate future losses related to theft. For instance, firms may design and implement better internal control systems, spend resources on theft prevention security systems and personnel, and purchase property theft insurance. In this paper, we mostly frame the costs of theft as direct losses due to stolen assets. However, there are also indirect costs of theft, such as reductions in productivity or management spending resources on crime-prevention efforts that could be allocated to operating activities. While firms can spend resources to reduce direct losses, such as buying insurance, these indirect costs of theft are harder to prevent. Further, while theft prevention measures may deter large theft-related losses, these measures can be costly. In sum, whether firms located in crime-ridden areas are riskier and whether this risk is priced into their cost of capital is an empirical question.

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However, it is challenging to empirically test the effect of crime on firms because they rarely report the occurrence or risk of theft-related losses. To overcome this difficulty, we exploit variation in property crime rates for the state where a firm is located as a source of variation in its exposure to the risk of theft. We adopt the convention in recent work and use a firm's headquarters state to proxy for its location (e.g., Korniotis and Kumar, 2013; Acharya et al., 2014; Dougal et al., 2015). We obtain crime rates from the Bureau of Justice Statistics over the years 1978–2011 and focus on the effect of property crimes, which include burglary, larceny, and motor vehicle theft, as these types of crimes are the most likely to affect firms.

We acknowledge that there are limitations to using state-level property crime rates for the state where firms are headquartered to capture their risk of theft. For example, this measure is noisier for firms that have geographically dispersed operations. Despite the limitations, however, there is a key advantage. Specifically, we are able to collect property crime rates for every state in the U.S. over a 34-year window. This allows us to examine the relation between the risk of theft and firm outcomes for a large cross-section of firms over a long time series. It also allows us to exploit time-series variation in property crime rates for each firm. In other words, because our model specifications primarily include firm fixed effects, our findings are based on average, within-firm variation in the outcome variable of interest (e.g., financing costs) in response to time-series variation in property crime rates.

We first examine the relation between the risk of theft-related losses and several measures that capture earnings variability. We use the term earnings in reference to income before extraordinary items, operating income, and operating cash flows. Across all three definitions of earnings, we find that firms headquartered in states with higher property crime rates have more volatile and less persistent earnings. Also, for firms headquartered in more crime-ridden states, analysts' earnings forecasts are less accurate, display greater dispersion among analysts, and exhibit greater revision volatility.

We next examine whether firms with a greater risk of theft have a higher cost of equity and debt capital. Theoretically, this risk will only be priced into firms' cost of equity if it is non-diversifiable, implying that theft-related losses would have to be greater during periods when economic conditions are poorer and relatively smaller when economic conditions are better. This possibility is supported by the observation that state-level conditions can change systematic exposures for firms in those states. For instance, Korniotis and Kumar (2013) show that state-level business cycles can impact the discount rate of local businesses by amplifying their exposures to systematic risk. As such, if crime amplifies exposure to systematic risk, then the risk of theft may increase firms' cost of equity.

A key prediction of the models of Becker (1968) and Ehrlich (1973) is that individuals are more likely to engage in criminal activities when the returns to legal activities are low, such as when there are fewer legal employment opportunities and constrained access to legitimate sources of income. Several studies support this prediction by showing that greater unemployment rates lead to higher property crime rates (e.g., Raphael and Winter-Ebmer, 2001; Gould et al., 2002). Thus, property crime rates and hence theft-related losses appear to be countercyclical, suggesting that the risk of theft may amplify exposure to systematic risk. As further support for this assertion, we find a positive relation between property crime rates and equity betas.

To test whether firms located in more crime-ridden areas have higher financing costs, we first calculate three measures of firms' expected cost of equity. We follow Barth et al. (2013) and estimate each firm's cost of equity based on the Fama and French (1993) 3-factor model, Jegadeesh and Titman (1993) and Carhart (1997) momentum 4-factor model, and Pástor and Stambaugh (2003) liquidity 5-factor model.¹ We proxy for each firm's cost of debt using bank loan spreads from the Dealscan database. We find that higher property crime rates are correlated with a higher cost of equity and debt. Firms headquartered in states with a one standard deviation higher property crime rate have a cost of equity that is 6.3% higher relative to the sample mean. Further, a one standard deviation higher property crime rate is associated with a 5.9% higher cost of bank debt.

Our last set of analyses more directly address potential econometric and endogeneity concerns. The first concern is that state-level property crime rates based on a firm's headquarters location may be a noisy proxy for the firm's risk of theft-related losses if it has geographically dispersed operations. The second concern is that our estimates of the effect of property crime rates on firms' cost of capital could suffer from an omitted variable bias if our models do not completely account for state-level economic activity that is correlated with both property crime rates and firms' cost of capital. While we control for state-level GDP growth rates, per capita personal income, and unemployment rates in our tests, we also show that our results are robust to further controlling for other factors related to a firm's costs of doing business (e.g., tax rates, real estate costs, employment regulations, and access to financing). Nevertheless, these variables may not completely control for all dimensions of economic activity or other unobserved factors. As we lack exogenous variation in property crime rates with which to completely isolate the effect of the risk of theft on financing costs, we perform three sets of tests to help alleviate these concerns. While none of the tests perfectly solve the endogeneity problem, the consistent results across the tests provide some reassurance.

First, we show that, for firms that are more likely to have geographically concentrated operations, state-level property crime rates have a larger effect on their cost of capital. In particular, the positive relation between property crime rates and firms' cost of equity and debt is more pronounced for smaller firms, firms without foreign operations, non-retail firms, and firms that mention fewer different states in their annual reports. These results also hold in regressions that include state-by-year fixed effects, which effectively difference out all variables that vary at the state-year level. Thus, these latter results are unaffected by omitted state-level factors.

¹ Our main results are robust to estimating each firm's ex-ante implied cost of equity using analysts' forecasts of future earnings from the IBES database as well as to using earnings forecasts obtained from two cross-sectional models proposed by Li and Mohanram (2014). An advantage of this latter approach over using analysts' earnings forecasts is that it allows us to calculate the cost of equity for firms with and without analyst coverage and avoids concerns related to biases in analysts' forecasts. We discuss these tests in Section 5.5.

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