



Contents lists available at ScienceDirect

Journal of Business Research



Corporate venture capital: The role of governance factors

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ARTICLE INFO

Article history:

Received 1 January 2016

Received in revised form 1 March 2016

Accepted 1 April 2016

Available online xxxx

Keywords:

Corporate venture capital

CVC investments

Corporate governance

ABSTRACT

Research on corporate venture capital (CVC) has consistently proven its importance for innovation and other strategic goals, yet information on the antecedents of CVC activity is scarce. This study provides theoretical arguments for the role of governance factors including board, CEO, and institutional ownership characteristics. Empirical evidence from an international sample of global CVC investments shows that factors such as having a board with multiple board mandates and institutional ownership are important factors for CVC activity. The conclusion is that the role of governance factors is important, and that subsequent research should not ignore this group of factors.

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1. Introduction

With the growing acceptance of the open innovation paradigm (Chesbrough, 2013), scholarly investigations of new practices in open innovation such as corporate venture capital (CVC) have increased substantially over the last decade. Focus has fallen on whether such practices actually stimulate innovation and achieve other strategic goals. Numerous articles have examined the effects of CVC, including inducing corporate innovation, comparing the impact of CVC to other forms of open innovation programs, investigating the conditions under which reaching mutually satisfying arrangements between the incumbent and a start-up is more or less likely (Dushnitsky & Lenox, 2005), and scrutinizing the pros and cons of various structural arrangements CVC adherents have adopted (Chesbrough, 2013). In short, the literature offers a relatively comprehensive picture of the significant consequences of an organization's commitment to and investment in its CVC program. Surprisingly, however, very little is known about the antecedents of CVC commitment and scale.

Given that the resources allocated to CVC come from other intracorporate areas, including internal R&D and alternative modes of open innovation, the lack of attention to what drives firms to commit to and invest in CVC is startling. CVC represents a major strategic commitment of incumbents' resources both financially and the upper echelon's time (Freese, Keil, & Teichert, 2007). Yet poor information and documentation exposes what prompts corporations to consider

(and ultimately approve) such commitment. Like other strategic decisions, instituting a formal CVC program is not easy to reverse; as such, understanding the drivers behind this program is essential (Schildt, Maula, & Keil, 2005). Surprisingly, the literature neglects the role of corporate governance factors as likely drivers of such commitment.

Historically, scholarly investigation of corporate governance factors has focused on effects on distant firm outcomes. Despite decades of empirical work, the links between such factors and firm performance are inconclusive and few consistent findings have emerged (Dalton, Daily, Ellstrand, & Johnson, 1998). As Zahra and Pearce (1989) note, this situation may owe to the high amount of likely factors. In essence, too many intervening processes between board characteristics and firm performance are likely to affect boards' relationship to performance outcomes. Likewise, too many influences on performance are likely to lead to a strong, direct association.

A more promising line of enquiry flows from examining the effects of governance characteristics on one of the intervening variables in terms of corporate strategy (e.g., Goodstein, Gautam, & Boeker, 1994). Yet scholars have seemingly ignored the role that governance factors play in the corporate adoption of VC practices (e.g., the ratio of board members that keep outside board directorship, multiple board mandates, as well as CEO pay mix and tenure). Scholars have approached the relationships between venture capital and corporate governance from one side. Namely, researchers have looked at the impact of accepting VC funding on the governance arrangements funding recipients have adopted. For example, new ventures receive funding may replace their founders and original board members by investing incumbents' representatives (Wasserman, 2006). However, this situation is likely to be a two-way street: corporate governance factors may help explain a corporation's degree of commitment to engaging in CVC programs.

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This study examines the effects firm ownership and corporate governance on a particular type of strategic investment decision, namely the firm's decision to invest in CVC. This study contributes by explicitly linking an aspect of a firm's investment behavior (the firm's involvement in CVCs) with the features of the board, CEO compensation, and ownership. The method consists of developing a matched sample of firms that do and do not engage in CVC investments.

2. Literature review and hypotheses

Dushnitsky and Lenox (2005) define corporate venture capital as equity investments in entrepreneurial ventures by incumbent firms. Unlike more standard forms of investment, financial gain is not the sole purpose of such investments. The corporate venture capital literature reports a plethora of entrepreneurial strategic objectives corporations pursue through CVC investments, including window on technology, leveraging internal technological developments, importing/enhancing innovation with existing business units, corporate diversification, securing demand on own products, searching acquisition targets, and tapping into foreign markets (Chesbrough, 2013).

Firms can use several modes or organizational forms when conducting corporate venturing. CVC investments, alliances, joint ventures, and acquisitions all fall under this definition. As Schildt et al. (2005) advance, different governance modes used to conduct such external corporate ventures are likely to differ in the degree to which they support explorative and exploitative learning. March (1991) suggests explorative learning emphasizes firms' search in areas where they do not currently have expertise. In contrast, exploitative learning involves deepening the firms' current knowledge base. March argues the need for firms to balance explorative and exploitative type activities in rapidly changing external environments.

CVC investments are the most arm-length investment of the mechanisms noted above for engaging in corporate venturing. Schildt et al. (2005) argue, somewhat contrary to expectations that this distance allows for the most effective form of explorative learning. Although the lack of "tightness"—when compared to joint ventures or alliances—might inhibit the development of explorative learning, the freedom to engage in learning away from the firm's dominant culture or capability rather promotes explorative learning. As they note, CVC investments entail less investment into unique assets tied to a specific partner (e.g., relationship specific) than non-equity alliances do, because these relationships result from a financial objective beyond the strategic learning objective. Taken together, the uncertain nature of explorative learning (March, 1991) and unknown strategic importance and operational relatedness of ventures aiming at explorative learning might lead firms to choose less integrated governance mechanisms, such as CVC, for projects that are explorative in nature.

2.1. CVC as a function of board structures

Agency theoretic logic suggests that board independence is one of the most important prerequisites of board effectiveness (Pugliese, Minichilli, & Zattoni, 2014; Upadhyay, Bhargava, & Faircloth, 2014). Studies examining independence summarily fail to isolate a strong link between notions of independence and corporate performance. Evidence shows independence's effect on specific board tasks such as executive dismissal (Borokhovich, Parrino, & Trapani, 1996), CEO compensation arrangements, and corporate turnarounds (Mueller & Baker, 1997). However, some doubts exist on whether outside directors are in a position to make substantial contributions to corporate strategy. Perhaps most crucially, the limited time investment of outside board members in any given board mandate results in a lack of intimate knowledge on the company and its operations. Given these informational disadvantages, outside directors are arguably prone to rely on measures of financial control. Such reliance may reinforce executive behavior that is short-term and low-risk orientated (March, 1991).

Evidence on the mix of insiders and outsiders on the board with respect to strategic involvement in decisions is inconclusive (Dalton et al., 1998). Still, scholars have pointed to the need for directors to have intimate company and industry knowledge. Without this knowledge, the board may tend to favor a financially crafted and quantifiable strategy. Although the outputs from CVC may be inherently long-term or involve the firm profiting from exploration activities, the initial decision to invest via a dedicated CVC department is essentially one of financial control. Directors will tend to approve the funding and strategy of the CVC unit in much the same way that they approve and monitor plans from other departments. Indeed, the arms-length relationship from the main firm may mean that outside directors, or those with particular skills in decision (financial) control, are particularly suitable to appraising the performance of such CVC operations. These arguments suggest that key structural and composition features of boards may have an association with the likelihood of the firm engaging in CVC.

H1a. The ratio of directors holding multiple board mandates on the firm's board has a positive relationship to the firms' CVC activity.

H1b. The ratio of outside directors on the board presents a positive association with the firms' CVC activity.

2.2. CVC activity and CEO characteristics

A CEO duality refers to the situation where the CEO is simultaneously the chair of the board. Proponents of combining the two roles note that such clear-cut leadership removes the ambiguity of accountability and responsibility for firm processes and outcomes (Dalton et al., 1998). Research has also suggested that CEO duality is the best structure for a company facing a crisis or in situations requiring quick decisions and a clear strategic orientation (Mueller & Baker, 1997). Pragmatically, a CEO-Board chair is responsible for organizing board meetings, developing the agenda, and providing information. Other work suggests that with increased environmental instability—particularly with new, disruptive technologies—separating the roles of CEO and board chair might be a way to cope with higher information-processing demands. For example, as Sanders and Carpenter (1998) note, companies with significant levels of international operations (signaling complexity) are more likely to have separate leadership structures. This study posits that when the CEO also chairs the board, the board's power to affect the firms' innovation strategy directly is likely to be lower.

H2. CEO duality has a negative relationship with firms' CVC activity level.

This study examines a key feature of the executive compensation plan drawing on the importance of executive compensation contracts as a governance mechanism in reducing latent moral hazard problems between investors and management. As Walsh and Seward argue, CEOs have certain incentives to entrench themselves, compromising the board's ability to attribute poor performance, for example, to the top managers. "The key to neutralizing the incentive controls is to avoid pay-for-performance plans that tie company performance to the stock market" (Walsh & Seward, 1990, p.432). The authors note that the entrenched CEO would seek to engineer a large fixed salary component at the expense of compensation that has a high link to stock price, for example. The problem is whether investing in CVC activities is more or less risky than investing in traditional R&D. To the extent that CVC is predominately a vehicle for exploration, CVC make the future payoff to these activities noisier than short-term orientated investments or investments that might favor exploitation. However, Sanders and Hambrick (2007) develop a behavioral agency model suggesting that the specific form of equity compensation matters; they propose that the proportion of option-based compensation (as opposed to direct equity compensation) has a positive relationship with more managerial risk-taking. According to their view, a large proportion of option-based

compensation may inspire “excessive” risk-taking from a stockholder’s perspective.¹

H3. The equity pay mix in CEO compensation has a negative relationship with the level of a firm’s CVC activity.

Despite bounded rationality’s clear characterizing trait of much executive decision-making, exactly how this boundedness occurs is of interest. Finkelstein and Hambrick (1990) suggest that CEO tenure is a proxy for an executive’s commitment to the status quo, risk aversion, and narrowness of information sources used. An alternative view suggests that longer-serving CEOs develop power vis-à-vis their board of directors and are thus able to impose their own preferences on board outcomes. The “career-concerns” hypothesis suggests that a CEO entrenchment—and in the absence of further promotion possibilities—motivates him or her to reduce investments in R&D to boost earnings (and thus bonuses) (Dechow & Sloan, 1991). The empirical evidence for this “horizon effect” of an impending CEO retirement on CEO preferences for investment behavior is weak. To the extent that CVC investments represent exploration search activities, this study posits that CEOs with long tenure prefer to invest in tried and trusted investment activities.

H4. CEO tenure presents a negative association with a firm’s CVC activities.

2.3. Institutional ownership and CVC

Rather limited research has examined how ownership patterns affect strategic and investment behavior. Gedajlovic, Yoshikawa, and Hashimoto (2005) advanced the notion that for the purposes of examining investment behavior, all shareholders should not be treated as a “monolithic” stakeholder group. Using a sample of Japanese companies, they found that the investment behavior of the companies was sensitive to the objectives of different types of shareholders.

This study focuses on institutional investors; as Johnson and Greening (1999, p.564) note, they “have a strong interest not only in the financial performance of the firms in which they invest, but also in the strategies activities and other stakeholders of those firms.” The exact way in which institutional shareholders affect firms’ investment strategies is a controversial area. According to the “short-termism” hypothesis, an association exists between the level of institutional holdings and a decline in the competitiveness and performance of US firms. Because of the monitoring and rewarding of institutions on a quarterly basis, these firms pursue short-term gains; as such, the management of the firms in which they hold stock receive pressure to adopt a short-term focus. Relatedly, research has suggested that institutional investors prefer corporate investment strategies that favor growth over the internal development of new products and R&D because of the longer time necessary to obtain gains (Hoskisson, Hitt, Johnson, & Grossman, 2002). The counter argument is that the time preference of institutional funds is longer than that of management. Firms can fire top management, for example, which can have short tenure; however, pension funds in particular focus more on longer-term gains. As such, they act in the long-term interest of the companies against the short-term interest of management. Indeed, evidence suggests that institutions are more likely to participate in key firm decisions (the propensity to vote their proxy) than the average small shareholder. However, the (potential) returns to a form of investment that is highly exploratory may be more difficult to communicate to the investment community than more exploitative investments. In essence, investment’s design

aims at allowing firms to move along their current trajectory, albeit in ways that become more efficient or profitable.

H5. Levels of equity ownership by institutional shareholders have a negative relationship with investment in CVC.

2.4. Board ownership and CVC

The board’s involvement in formulating strategy is likely to be contingent on the incentive for the board’s participation. This study posits that such involvement is contingent on the board’s direct incentives to represent the interests of the firm’s principals. Prior research shows differences in company performance when the board owns a significant stake. Furthermore, some evidence and observation from practice indicates that engaged boards (outsiders with significant equity holdings) are more likely to participate in the firm’s long-term strategy on a continuing basis (Hoskisson et al., 2002). Few studies directly address the effect of ownership on types of strategy; this study advances that higher levels of board ownership may then lead to the firm seeking out new renewal or explorative opportunities, as opposed to committing to the status quo in terms of current strategy.

H6. A positive association exists between board equity ownership and firms’ CVC activities.

Corporations differ with respect to their espoused levels of risk tolerance. Some firms may invest in inherently risky, early-stage ventures in which the technology remains unproven, and the prototype does not exist. Other firms may explicitly pursue a more risk-averse policy, pursuing costlier but more certain later-stage startups, where they can see exactly what they are getting for their money (Fredriksen & Klofsten, 2001). Thus, different types of owners have different preferences regarding the risks the corporations they control take. As such, their support of corporate CVC policies may differ as well. This difference, in turn, may have profound implications for the levels of CVC investments the corporations acquire. Here, this study explores whether the corporation’s espoused risk tolerance can further accentuate the relationship between the ownership structure and CVC activity.

This study posits that the level of risk the corporation’s policies explicitly allow with respect to the firm’s CVC investments are likely to amplify the effects of ownership structure discussed thus far. In other words, board members with an ownership stake in the firm that have an interest in explorative development and strategic renewal will likely support more CVC investments if the corporation adopts an explicitly high-risk investment strategy compared to a corporation with explicitly risk-averse policies. Similarly, risk tolerance is likely to amplify the hypothesized negative effect of institutional ownership on CVC activity: risk-averse institutional investors are more likely to inhibit investments in new ventures if corporate policies toward such investments are explicitly risky.

H7a. Levels of risk the corporation tolerates with respect to its CVC involvement positively moderate the relationship between board equity ownership and CVC activities.

H7b. Levels of risk the corporation tolerates with respect to its CVC involvement negatively moderate the relationship between institutional ownership and CVC activities.

3. Data and methods

3.1. Sample

This study constructs a unique dataset by matching multiple secondary data sources. Using VentureXpert by Venture Economics and Corporate Venturing Directory and Yearbook by AssetAlternatives the

¹ Because no executive would rationally exercise an underwater option, it is possible to (wrongly) think that options have no downside value. They do; but the logic here is that the executive is focused on the upside potential of the option, and may increase, for example, the “bets,” or volatility of the stock.

study reconstructs the pattern of CVC investments by incumbent corporations. VentureXpert contains detailed information on the activities of the private equity industry and is a common source in CVC research. The Yearbook covers a similar domain and also appears in previous CVC literature. Both these data sources have certain deficiencies and may inflate the number of investment rounds or double count particular deals. Furthermore, when sharing information on many investments, each data source has information on some deals that the other database does not cover. As such, working with both data sources is highly desirable. Carefully matching the data allows obtaining the most accurate information on the CVC disbursements of the corporations. VentureXpert covers the period from 1969 to the present, whereas the Yearbook contains information on CVC investments made from 1998 to 2001. Accordingly, the study uses the data on investments obtained during this 1998–2001 period.

After matching the data on CVC deals reported by VentureXpert and the Yearbook, the next step is to merge the database with annual firm-level accounting and financial data from Standard & Poor's Compustat. Because the data reported in Compustat relate to a financial year and not a calendar year, the study does not use VentureXpert's direct reports on annual aggregates, but instead look at the exact dates of particular deals to match them to appropriate financial years. The merger of VentureXpert, the Yearbook, and Compustat yielded a sample of 163 corporations that engaged in corporate venture capital investments during years 1998 to 2001. This study excludes certain industries such as financial services real estate, hotels, and so forth.

The study augmented the dataset by matching these corporations to otherwise similar firms that did not participate in CVC activity during the specified period. Matching follows 4-digit NAICS codes, industry aggregation, and six-year average sales figures. For each corporation with an active CVC program, two firms in the same industry have no CVC involvement—one with 6-year average sales right below and another one right above the focal corporation's average sales. When matching companies, the study focuses on two non-CVC firms to ensure that the matches are as similar as possible to CVC-active firms in terms of industry as well as scale and scope. Because some of the non-CVC firms matched more than one corporation with CVC, the study includes 187 corporations to provide a reasonable match for all 163 active CVC investors. For example, JNPR and EFII belonged to the same industry and had very similar 6-year sales; therefore, the matching process linked them to HTCH and CRUS. The final sample contained 350 corporations.

Finally, data on corporate governance and ownership structure augmented the sample. The key governance data came from The Corporate Library's Board Analyst database. Because these data was not available for all firms and years for which CVC data was available, this step reduced the sample to 153 corporations. Because of incongruities between calendar and financial years that corporations adopt, the study pooled the data across 2000 and 2001.

3.2. Variables

3.2.1. Dependent variable

The study operationalized the intensity of a corporation's CVC activities as the number of distinct ventures the incumbent supported during the specified period. Prior research has tended to look at the dollar amount of CVC investments or the number of deals (Dushnitsky & Lenox, 2005). For the context of this study, both these measures have certain deficiencies compared to the measure used in this study. Because corporations benefit strategically from their investment regardless of the investment size, considering the dollar amount may introduce unnecessary noise. In fact, the amount invested is often simply a function of the investment round and does not indicate the investment's importance or relevance; indeed, later rounds typically require more significant investments (Gompers & Metrick, 1998). To that end, the study specifically included corporate preferences with respect to investment round into the model as a risk tolerance variable. Furthermore, this measure is advantageous compared to the number of deals during the specified period. Multiple investments in the same venture within a certain time frame may simply reflect investment tranches or accounting practices the corporation uses. What is of importance is the number of distinct firms supported during a particular period and not how often the corporation wires money to the respective accounts. Thus, the dependent variable is a high-quality reflection of the CVC activity of incumbent corporations.

3.2.2. Independent, moderator, and control variables

The study used The Corporate Library's Board Analyst database to extract the percentage of the board with multiple board mandates to determine how many board members had at least one board appointment, outsider board ratio, and therefore the ratio of the number of non-executives to executives on the board. The study also extracted data on CEO duality (Dalton et al., 1998). In addition, the study extracted equity pay mix in CEO compensation and CEO tenure, which is the result of the proportion of option-based compensations as opposed to direct equity compensations and the number of years in the CEO position, respectively (Sanders & Hambrick, 2007). Calculating the presence of institutional shareholders allows capturing institutional equity ownership and board equity ownership, resulting from calculating the presence of board members' equity holdings (Hambrick & Jackson, 2000).

As noted, venture capital research suggests that the preferred investment stage reflects the risk tolerance an investor's policies allow. Seed- and early-stage ventures (where no working product prototype is yet available) present a very high-risk investment opportunity for the firm, whereas later-, extension-, or balanced-stage investment targets relate to lower levels of risk (Fredriksen & Klofsten, 2001). Thus, the risk tolerance allowed by the investor's policies is the dummy variable, which takes on a value of 1 if the preferred investment round for the CVC program of interest is seed- or early-stage ventures, and 0 if the

Table 1
Descriptive statistics and pairwise correlations.

	Mean	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.–10.
1. Number of CVC investments	4.93	18.33									
2. log (sales)	7.73	2.08	0.18*								
3. Peer-adjusted return	−8.42	38.21	−0.06	0.28*							
4. Equity pay share	0.48	0.26	−0.12	−0.34*	−0.12						
5. Multiple board mandates	0.10	0.12	0.13	0.36*	0.11	−0.13					
6. Outside director ratio	0.73	0.14	−0.02	0.22*	0.29*	−0.11	0.14				
7. Board equity ownership	0.21	0.17	−0.14	−0.39*	0.04	0.26*	−0.08	−0.14			
8. Institutional ownership	0.62	0.16	−0.11	−0.04	0.12	−0.13	0.02	0.09	0.17*		
9. CEO duality	0.66	0.47	−0.12	0.13	0.14	−0.19*	0.07	0.31*	−0.16	0.04	
10. CEO tenure	3.51	7.21	0.02	−0.06	−0.04	0.02	−0.03	0.12	0.11	0.05	0.25*
11. Risky investments	0.15	0.36	−0.07	−0.33	0.07	0.00	−0.18	0.05	0.15	0.12	0.04
											0.08

* Indicates $p < 0.05$.

Table 2
Results of negative binomial regression analysis.

	(1)	(2)	(3)
<i>Controls</i>			
Log (sales)	0.41*	0.36*	0.43*
	(0.13)	(0.12)	(0.12)
Peer adjusted return	-0.01*	-0.01*	-0.01*
	(0.00)	(0.00)	(0.00)
Equity pay share		-1.06	-1.29**
		(0.79)	(0.80)
Multiple board mandates		2.88*	2.81*
		(1.17)	(1.19)
Outsider ratio		1.44	0.89
		(1.35)	(1.36)
Board equity ownership		-1.45	-1.39
		(1.11)	(1.21)
Institutional ownership		-2.31*	-2.33*
		(1.06)	(0.99)
CEO duality		-0.83*	-0.96*
		(0.42)	(0.34)
CEO tenure		0.01	-0.01
		(0.03)	(0.02)
Risk-level of the investment			-1.79
			(2.55)
Risk-level of the investment * board equity ownership			12.63*
			(2.78)
Risk-level of the investment * institutional ownership			-0.57
			(3.05)
Obs	153	153	153
Wald test (p value)	21.44 (0.00)	32.45 (0.00)	55.04 (0.00)

Note: The dependent variable in equations (1)–(3) is the number of CVC investments.

* Indicates $p < .05$.

** Indicates $p < .10$.

preferred investment round is later-, extension-, or balanced-stages). The study controls for sales and peer-adjusted return to partial out size effects of incumbents and partner companies on CVC activity.

4. Results

Table 1 displays the summary statistics and correlation matrix of variables used in this study. The means and standard deviations are reasonable. Across the matched sample, the average number of CVC investments is just below 5. The high standard deviation owes partly to the fact that one firm (Intel) engaged in more than 150 CVC ventures in the final year of data, which is twice as many as the next largest.² Another reason for the high standard deviation is that the CVC activity is highly cyclical and some years witnessed much higher levels of CVC investments than others. Therefore, controlling for temporal effects across the models is essential. The modest correlation of independent variables, below acceptance levels, denotes lack of multicollinearity.

The measures are non-negative counts, whereby the study employs negative binomial regression techniques.³ This study uses multiple negative binomial regressions with independent variables inserted sequentially into the model. This process allows a close examination of the behavior of the model during the addition of variation sources.

Moving from Column 1 (containing the control variables) to Column 2 of Table 2 tests for the hypothesized direct effects. The results support H1a, namely the hypothesized positive relationship between the percentage of the board with multiple board mandates and CVC activity. The data do not support the outsider board ratio effect (H1b). As hypothesized, the effect of CEO duality on CVC activity is negative and significant, thus supporting H2. Very limited or no support exists for either the link between equity pay mix in CEO compensation or CEO tenure and CVC activity (H3 and H4). Although the results support the

hypothesized negative relationship between institutional ownership and CVC activity (H5), they fail to support any relationship between board equity ownership and CVCs (H6).

With respect to testing the moderation effects (H7a and H7b), the ownership variables include an interaction term of risk-level of the investment (modeled as whether the firm invests in seed- or early-stage investments). The results partially support H7a by showing that boards with higher levels of equity and support for risky investments have higher levels of CVC activity. The interaction of early-stage investment behavior and institutional ownership has no effect in the data.

5. Conclusions and further research

Research interested in antecedents to CVC activity has thus far not emphasized the role of governance factors. The finding that governance factors influence CVC activity is important, because this result supports considering governance factors in CVC organization. This finding has potentially broad interest because CVC is an increasingly popular context in which many companies operate. The present research offers an initial view of how governance factors influence CVC activity and suggests important areas for further research. These areas include ways in which CVC activity and board governance influence each other. Furthermore, the lack of support to CEO tenure as an important factor affecting a corporation's CVC strategies calls for further attention. Nevertheless, the findings suggest that scholars should pay greater attention to this area of research.

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² We are mindful of the effect such an outlier could have on the regression results. The results are robust to this sensitivity analysis.

³ The closely related, but more restrictive, Poisson regression technique produces similar results.

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