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From start-up to acquisition: Implications of financial investment trends for small- to medium-sized high-tech enterprises

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ABSTRACT

The high-technology (high-tech) industry is a dynamic environment defined by both frequent changes in composition and a concentration of market power through consolidation. Operating as a new or small venture within this environment poses many complex challenges, especially when considering the financial resources needed to be successful. In their efforts to obtain financial resources, entrepreneurs often overlook how the choice and pattern of investment funding to maintain a growth path can later affect a successful entrepreneurial exit. Exit via acquisition for small- to medium-sized technology enterprises (SMTEs) is a strong area of interest given firms in the U.S. high-tech industry experience the fastest growth rates and have been the target of over $400 billion in deal volume and 20% of all merger and acquisition (M&A) transactions in the last twenty years. Much of this M&A activity is conducted by five prominent firms, Alphabet, Amazon, Apple, Facebook, Microsoft, commonly referred to as the Fearsome Five or the "FANGS". However, as there has been only limited research examining this unique M&A context, in this study we explore the investment funding factors influencing exit via acquisition by the Fearsome Five. We highlight questions and potential concerns for SMTEs given the trends in financial investments and increasing market power.

Introduction

High-tech firms operate in a highly dynamic environment typified by both frequent changes in industry composition (Wolf & Terrell, 2016) and an increasing concentration of market power among a small group of large firms through aggressive acquisition activity driving consolidation (Andriole, 2017; Deans, Kroeger, & Zeisel, 2002). Operating as a small- to medium-sized enterprise (SME) within this highly dynamic and increasingly concentrating environment poses many new and complex challenges, especially when considering the financial resources needed to successfully start, grow, and exit a venture (e.g., Droege & Marvel, 2009; Gnyawali & Park, 2009; Simpson, Padmore, & Newman, 2012; Zulu-Chisanga, Boso, Adeola, & Oghazi, 2016). One factor entrepreneurs often overlook in their efforts to obtain the necessary financial resources to grow a venture and provide a pathway to successful entrepreneurial exit (Rosenbusch, Brinckmann, & Müller, 2013) is the pattern of investment funding (Ragozzino & Blevins, 2016). For example, in traditional Founder, Angel, and Venture Capital backed firms, both the number of investors and early investment are associated with increased likelihood of acquisition (Ragozzino & Blevins, 2016). However, a more recent trend of investor diversification which includes incubators, accelerators, and crowdfunding approaches provides new investment options for firms looking for financial resources, which may affect funding decisions and exit outcomes (Drover et al., 2017).

High-growth-potential technology firms, also referred to as small- to medium-sized technology enterprises (SMTEs) (Li, Qian, & Qian, 2012; Qian & Li, 2003), represent more than 10% of all US SMEs (Caruso, 2012), which make up over 99% of all U.S.

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organizations (Small Business & Entrepreneurship Council, 2016). The U.S. high-tech industry is also recognized as the fastest growth market for the industry (Biery, 2017) and U.S. high-tech firms represent over $400 billion and 20% of all merger and acquisition (M&A) transactions over the last twenty years (IMAA, 2018). The recent "Jumpstart Our Business Startups Act", which changed the regulatory environment for investment options to help small businesses (Lander, 2012), and the increase in alternative funding options (Colombo, Franzoni, & Rossi-Lamastra, 2015; Mollick, 2014; Prive, 2012) adds further complexity and change to the financial environment in which SMTEs operate (Spigel & Harrison, 2018).

One development over the last decade is the expanded growth and concentration of wealth within the high-tech industry. Alphabet, Amazon, Apple, Facebook, and Microsoft, termed the "FANGS" or "Fearsome Five," are among the largest, most recognizable, and most valuable global brands (Bradshaw, 2017), and the wealthiest technology firms in the world posting a collective market cap of $3.3 trillion (La Monica, 2017). Their growth and increase in market power is one added wrinkle to the global complexity in which SMTEs operate. Such industry concentration and the potential for oligopolistic influence (either real or perceived) has the potential to greatly influence resource allocations and/or distort markets in many ways (e.g., Anderson & Tushman, 2001; Dalton, Todor, Spendolini, Fieldingg, & Porter, 1980; Love & Roper, 1999). The effect of such factors on SMTE growth both in terms of influencing the financial investment environment and acquisition activity could have profound effects on the industry and is clearly in need of further research attention.

To examine the influence and implications of these factors, in this research study we evaluate such factors and their implications for influencing an SMTE's acquisition. In doing so we focus on evaluating two of the potential major influential factors: The availability of financial resources and the increasing power of the Fearsome Five within the high-tech industry. The objectives of this study are as follows: (1) to examine the changing financial investment environment within the high-tech industry; (2) to determine the effects of the different investment trends on SMTE exits to acquisition; (3) to understand the role and influence of the Fearsome Five firms on SMTE current exits and future options. In our pursuit of the answers to these questions, we focus on SMTE's in the U.S. over the last 20 years and develop hypotheses for the implications of several prominent influencing factors on acquisitions. We then examine these hypotheses using sample data consisting of a cross-panel of SMTEs, who obtained one or more type of investment funding and who subsequently exited via acquisition or did not, in order to better understand the role and implications of investment funding sources and their associated outcomes. To provide additional insights for both research and practice, we extend our analysis to incorporate the industry composition and assess how the top five firms of the high-tech industry engage in SMTE acquisitions. We conclude with a discussion of the implications of our results for academic research and practice, as well as considerations of limitations and suggestions for future research.

Theoretical Development

Entrepreneurs face many challenges and decisions in their efforts to sustain and grow their businesses (e.g., Baron, Franklin, & Hmieleski, 2016; Slevin & Covin, 1998; Spigel & Harrison, 2018). SMTEs are no exception and face additional hurdles operating in a fast-paced high-tech industry (Biery, 2017) and the increasingly varying options of how to pursue their growth. For example, incubator and accelerator programs (Albort-Morant & Oghazi, 2016; Drover et al., 2017) provide SMTEs with additional avenues to acquire resources including financial support (Chen, 2009; Drover et al., 2017). While many types of resources are associated with entrepreneurial growth such as networking opportunities (Ebbers, 2014) or training programs (Lyons & Zhang, 2018), one necessary requirement for both growth and survival is the ability of a firm to acquire financial resources (DeSantola & Gulati, 2017).

According to the resource-based view (RBV; e.g., Barney, 1991; Wernerfelt, 1984) competitive advantage can be obtained through the use of valuable tangible resources such as access to financial capital, which in turn may enable firms to acquire and/or fund the development of rare, inimitable, and non-substitutable technological and human capital resources and

capabilities. For example, financial resources enable SMTEs to hire valuable strategic human capital, build new organizational and technological capabilities (McKelvie & Davidsson, 2009), which are associated with overall new venture performance and growth (Chandler & Hanks, 1994), and are critical to generate a positive cash flow to avoid early failure including bankruptcy (Liao, Welsch, & Moutray, 2008; Thornhill & Amit, 2003). However, the challenges in obtaining financial resources can be daunting to many entrepreneurs. To obtain financial resources, the entrepreneur needs to identify high-potential funding options, apply for funding, and provide documentation for why investment in their firm will produce returns and lead to an exit opportunity or liquidity event that meets expectations of the investor (Carpentier & Suret, 2015; Fairchild, 2011; Mitteness, Sudek, & Cardon, 2012; Winston Smith, 2011).

The role of the environment (D'Souza & Kemelgor, 2008) and industry (e.g., high-tech; Liao et al., 2008; Lumpkin & Dess, 2001) can also affect the financial resources, strategic path, and exit options for entrepreneurs (Zulu-Chisanga et al., 2016). Environmental uncertainty, measured through the levels of munificence, dynamism, and complexity (Dess & Beard, 1984), in the high-tech industry adds another level of complexity and provides an interesting backdrop for understanding the financial decisions SMTEs make. The increase in the number and type of investors reflect an increase in the complexity of the financial decisions as it provides more options to entrepreneur owners. Previous literature on entrepreneurs and investors focused on the success of financial and non-financial factors (DeTienne, McKelvie, & Chandler, 2015), different motivations (Achtenhagen, Brunninge, & Melin, 2017; DeTienne et al., 2015), and/or conflicts between the two groups (Collewaert, 2012). This challenge of navigating the "right" path in selecting investment opportunities, both in timing and type(s), may not be prioritized over the general challenge of just obtaining the financial resources required. However, as we argue and examine in our study, these decisions matter when looking forward to entrepreneurial exit via acquisition as they may influence the availability and type of exit option. In addition, the complexity of the decision is further enhanced given the changing dynamics of the high-tech industry and its operating environment (e.g., Boso, Story, Cadogan, Micevski, & Kadic-Maglajlic, 2012; Decker, Haltiwanger, Jarmin, & Miranda, 2016; Wolf & Terrell, 2016).

The reduction in the complexity of an industry, outlined by the concentration of the number of top firms over the total number of firms, increases barriers to entry and thus poses challenges to start-ups and SMTEs (Porter, 1979). One example of this environment is seen with the continued growth in the high-tech industry. The market concentration, control, and power of the Fearsome Five are proposed to have a negative impact on innovation (Curry & George, 1983; Dolata, 2017; Turner, Mitchell, & Bettis, 2010) and have brought forth calls for antitrust legislation to manage their growing influence (Manjoo, 2016). In addition, Liao et al. (2008) highlight that new entrepreneurs of high-tech firms have to manage many demands for success, which include adjusting to market conditions and intellectual property requirements while still working with venture capitalists to acquire funding.

One advantage to exit via acquisition is the ability of a quick and handsome repay to investors. VCs interested in a planned exit of their investment include options of either through a SMTE's IPO or acquisition (Drover et al., 2017). SMTEs may entertain the option of acquisition based on the possibility of growth without the additional overhead of searching for more funding. As Li et al. (2012) outline, difficulties to expand both products and internationally to remain competitive in the high-growth environment of the technology industry may not align with the entrepreneur's motivations and future interests (Carsrud & Brännback, 2011; Gabrielsson & Politis, 2011; Shane, Locke, & Collins, 2003; Wright, Robbie, & Ennew, 1997). Our focus is on the financial motivations for exit (Strese, Gebhard, Feierabend, & Brettel, 2018). We do not include the failure options such as bankruptcy and liquidation, or where the SMTEs remain independent or choose to go public (Pagano, Panetta, & Zingales, 1996). While these types of exit options are also important, they are beyond the scope of our in-depth analysis of acquisitions through which we seek to provide a better understanding of the changes in concentration in the high-tech industry.

In previous assessments of the likelihood of venture-backed firms to go public or be acquired scholars identify the need for a better understanding of the role

of different types of funding beyond venture capital (Ragozzino & Blevins, 2016) and of the underlying motives of the entrepreneurs (Ragozzino & Reuer, 2007). More specifically as Drover et al. (2017, p. 1845) highlighted, more research is needed into different earlier-stage funding mechanisms for new ventures and their interactions with other prospective investors and stakeholders.

Factors Influencing Exit via Fearsome Five Acquisition

The firms making up the Fearsome Five are typified by a "high demand for scientific research and intensity of R&D expenditure, high level of innovativeness, fast diffusion of technological innovations, ..., high level of employment of scientific and technical personnel...," (Zakrzewska-Bielawska, 2009, p. 94). Authers (2017), the senior investment commentator of the Financial Times, summed the year 2017 up in one word: "FANGS," defined as "the label for the group of evermore powerful internet companies that dominate the online world, which also made their investors very, very rich in 2017". This elite group of high tech behemoths uses their size, market power, and vast financial resources to engage in extensive M&A activity.

While the motivations for their M&A behavior may be classically presumed to improve firm growth and performance, increasing shareholder value, etc. (e.g., Grimpe & Hussinger, 2014; Hagedoorn & Duysters, 2002; Makri, Hitt, & Lane, 2010), research has been unable to clearly link such motivations with performance outcomes (King, Bauer, & Schriber, 2018; King, Dalton, Daily, & Covin, 2004). Some leading scholars and industry insiders speculate on more nefarious set of motivations for M&A activity (Carper, 1990; Moeller, Schlingemann, & Stulz, 2005), including eliminating current or preventing future competitors, as well as the procurement of proprietary knowledge, technology, patents, and/or talent (Christensen, Alton, Rising, & Waldeck, 2011; Kaul & Wu, 2016).

The implications of M&A activity from "super predators" such as the Fearsome Five present an interesting area in need of further study, specifically from the target's perspective. The RBV perspective views firms as a "bundle of resources" (Barney, 1991) and thus provides that SMTEs and the Fearsome Five may utilize M&A activity to enhance their resource positions. The application of RBV, originally put forth by Wernerfelt (1984), outlines how to address certain management issues such as the diversification or the acquisition of firms by answering the question, "Why acquire?" given M&As are known to have a high likelihood of failure (Christensen et al., 2011). The potential for SMTE acquisitions to provide specific resources to larger firms like the Fearsome Five that are more easily acquired than built outlines one motive for the acquisition. This type of motive aligns with Wernerfelt's (1984) argument that a firm wants either to utilize its resource position directly or indirectly to achieve a competitive advantage over competitors. This argument also directly applies to other types of resources such as human resources (talent) or workplace processes that are highly sought after in high-tech industries.

Experience with Investors. Prior research has shown that, in the short-term, both target firms and acquiring firms gain from an M&A announcement (Kashiramka & Rao, 2014; Kohers & Kohers, 2000). Acquiring firms' shareholders are excited about potential value creation and the premiums that target firms receive from the acquiring firm increase the target's valuation. However, the difficulty involved in bringing on new firms, including cultural fit and the degree or speed of integration, often shows a decrease in value in the long term (Bauer & Matzler, 2014). However, Fearsome Five firms are much better positioned to overcome these difficulties. First, they are what the Boston Consulting Group (BCG) refers to as "Serial Tech Buyers": firms that completed more than five tech M&As over ten years' time (Kengelbach, Klemmer, Schwetzler, & Sperling, 2012). This status allows them to have a deeper understanding of the M&A process and how to make the deal work out in their favor. Secondly, Fearsome Five firms have more resources to dedicate to M&A activities. In another BCG publication, Hansell, Walker, and Kengelbach (2014) explain that by articulating a set of underlying principles and policies successful serial acquirers are able to add rigor and discipline to the M&A process.

Firms that lack established processes and procedures offer a greater chance for the acquiring firm to create synergies with the target firm (Ransbotham & Mitra, 2010). In addition to potential synergies, acquir-

ers are interested in smaller or younger firms that offer innovative power (Graebner, Eisenhardt, & Roundy, 2010) and the intrinsic sources of motivation for innovation found in successful SMEs (Schenkel, Farmer, & Maslyn, 2019). As Graebner et al. (2010) note, larger acquirer firms will value skill or performance more highly than seniority when assessing SMTEs as targets. In addition, the relationship between acquisitions and R&D is shown to possibly act as a substitute for innovation (Blonigen & Taylor, 2000). Furthermore, acquiring firms looking at smaller and younger target firms benefit from valuation uncertainty, allowing the acquirer to buy low early and potentially reap greater rewards through acquisition (Ransbotham & Mitra, 2010). Thus, to offset the difficulty and cost of internal R&D or take advantage of information asymmetry, established firms like the Fearsome Five, will be more likely to acquire less established SMTEs. Established serial acquirers (e.g., Hansell et al., 2014; Kengelbach et al., 2012; Laamanen & Keil, 2008), prominent competitors / firms represented in an oligopoly (Nilsen, Sørgard, & Ulsaker, 2016; Salvo, 2010), and those with excess cash (Brush, Bromiley, & Hendrickx, 2000; von Beschwitz, 2018), may be more likely to engage in SME acquisitions. Thus, a Fearsome Five firm is more likely to engage in acquisitions of SMTEs in comparison to other high-tech firms that do not have a history of acquisitions and access to additional resources for M&As. Therefore, stated formally, we propose that:

Hypothesis 1. SMTEs with less experience with investors will have a higher likelihood of acquisition by a Fearsome Five firm as compared to SMTEs with more experience with investors.

Number and Value of Investments. As SMTEs may be resource-constrained (e.g., Bendickson, Davis, Cowden, & Liguori, 2015; Li et al., 2012; Parida, Westerberg, & Frishammar, 2012) and newly formed and developing businesses require influxes of financial capital for continuing operations and growth (Blevins, Ragozzino, & Reuer, 2017), a firm's success in obtaining funding, including how much and how often, can serve as a positive signal to the market (Elitzur & Gavious, 2003; Islam, Fremeth, & Marcus, 2018). Similar to literature on signals surrounding IPO announcements (Mantecon & Thistle, 2011; Ragozzino & Reuer, 2007), venture capital funding can provide firms with legitimacy to attract other investors (Deeds, Mang, & Frandsen, 2004; Mitteness, Baucus, & Norton Jr, 2013; Peake & D'Souza, 2015) and help reduce uncertainty of future investments (Kollmann & Kuckertz, 2010; Ragozzino & Blevins, 2016). As such, a firm's collective history of venture capital investment funding can provide insights into the perceived worth and anticipated growth of a developing business (Ragozzino & Blevins, 2016).

In contrast, firms with high levels of market power (Galbraith & Stiles, 1984) and extensive financial resources (Bruner, 1988) may be in a position to not have the necessity to conduct extra vetting in the acquisition of SMTEs. This situation may be particularly prevalent in an industry controlled by an oligopoly whose leading firms have enhanced knowledge of the market and industry (M'Chirgui, 2009). This superior market position provides an information advantage that allows for those firms like the Fearsome Five better to assess SMTEs that have limited number of investors or investor dollars. In addition, firms representing an oligopoly power can assume greater amount of risk (Hitt, Hoskisson, & Ireland, 1990). Thus, a Fearsome Five member may be more likely to take a chance on SMTEs with less investor commitment. Stated formally, we propose:

Hypothesis 2. SMTEs with a lower number of investors will have a higher likelihood of acquisition by a Fearsome Five firm as compared to SMTEs with many investors.

Hypothesis 3. SMTEs with a lower value of investment dollars will have a higher likelihood of acquisition by a Fearsome Five firm as compared to SMTEs with high investment dollars.

Incubator and Accelerators. SMTEs may utilize different sources of funding to support their growth than other types of firms (Drover et al., 2017; Sudek, 2006). The financing options for SMTEs include venture capital (VC), corporate venture capital (CVC), angel investment, and crowdfunding (Drover et al., 2017). These options are chosen by the entrepreneurs based on numerous selection criteria such as the similarity between the investor and entrepreneur (Bruns,

Holland, Shepherd, & Wiklund, 2008; Franke, Gruber, Harhoff, & Henkel, 2006; Murnieks, Haynie, Wiltbank, & Harting, 2011). In addition, globally, countries have expanded the availability of financial resources through grants for small start-up organizations (Islam et al., 2018). The ability to obtain a grant from institutions is associated with increased legitimacy with a newer start-up (Mitteness et al., 2013; Tracey, Dalpiaz, & Phillips, 2018), which has subsequently resulted in the start-up achieving more success and additional VC funding.

One distinguishing factor a Fearsome Five firm may look for in SMTEs is higher legitimacy in comparison to other SMTEs. Legitimacy gained through having interest from multiple types of funders allows for a SMTE to demonstrate the ability to attract different types of investors' interest (Drover et al., 2017). The ability to obtain various sources of capital can also be of competitive advantage to firms and validate their resilience and openness to many opportunities for growth (Sequeira, Weeks, Bell, & Gibbs, 2018).

Incubator and accelerator investment opportunities can provide start-ups with additional resources and are associated with an increased likelihood of growth and continuance (e.g., Liao et al., 2008; Roig-Tierno, Alcazar, & Ribeiro-Navarrete, 2015). An incubator or accelerator can be independently owned and operated as a stand-alone business, a sub-unit as part of a larger corporation (Kanbach & Stubner, 2016), or be provided as part of a University program (Berbegal-Mirabent, Ribeiro-Soriano, & García, 2015; Dada & Fogg, 2014). While there is no consensus on the difference between an incubator and accelerator, incubators are typically more focused on early-stage ventures while accelerators have more predominately focused on organizations looking to increase growth of an already established product or service (Isabelle, 2013; Malek, Maine, & McCarthy, 2014). While different incubators and accelerators may have slightly different requirements and goals, the result of their investment is directed toward the continued success of the business by providing not only financial resources but also programs and curriculum providing an ecosystem of mentors and training resources (Dempwolf, Auer, & D'Ippolito, 2014; Kohler, 2016; Pauwels, Clarysse, Wright, & Van Hove, 2016).

Social capital is one important resource for entrepreneurs (Liao et al., 2008). Social capital, is defined in the literature as the "goodwill derived from relationships, both formal and informal, that managers have with others and can use to obtain resources and information" (Helfat & Martin, 2015, p. 1286). As such, it can provide resources to SMTEs through access to additional financial capital, the ability to gain legitimacy more quickly, or to facilitate business through the network of relationships of the entrepreneurs (Liao et al., 2008). For example, accelerators like Y-Combinator, based in California's Silicon Valley, provide a unique opportunity for entrepreneurial networking that can aid venture development (Drover et al., 2017; Hallen, Bingham, & Cohen, 2014). Thus, given the potential or a scarcity or shortage of resources SMTEs may experience (Nouri & Ahmady, 2018), the benefits of both incubators and accelerators include creating links between the organization and individuals to help support and grow the venture (Albort-Morant & Oghazi, 2016). Both the legitimacy of participating in an incubator or accelerator program and strategic relationships built within the high-tech community (Albort-Morant & Oghazi, 2016; Liao et al., 2008) would make them a potential target for a Fearsome Five member. Thus, the addition of additional perceived legitimacy of funding through the access and visibility afforded by participation in an incubator or accelerator program provide a positive environment for increasing the likelihood of a Fearsome Five firm acquisition. Thus, stated formally, we propose:

Hypothesis 4. SMTEs participation in an incubator or accelerator will increase the likelihood of acquisition by a Fearsome Five member as compared to SMTEs who do not participate in an incubator or accelerator.

Geographic Proximity. One additional component highly associated with the participation in an incubator or accelerator program is the co-location requirements typically required by the start-ups (Pauwels et al., 2016; Tracey et al., 2018). This co-location is claimed to help increase the opportunities for participation in events and help expand the social capital of the participants, thus further associated with a successful exit such as through an acquisition. The type of events including typical demo days hosted by these investment funders also provides an opportunity for

acquirers a "one-stop" venue to assess many different ventures for either further investment or acquisition (Cohen, 2013; Kanbach & Stubner, 2016; Kohler, 2016). This opportunity provides cash-rich high-tech firms such as the Fearsome Five an efficient mechanism to identify and assess SMTE's that participate.

The opportunity to successfully network with potential acquirers is further enhanced if the SMTE is located in geographically close proximity to the acquirer, increasing the likelihood of awareness of, and interaction with, the target, as well as reducing the costs of travel to visit and evaluate the target. All factors that should be positively associated with increasing the opportunity for future engagement and possible likelihood of acquisition (Ragozzino & Reuer, 2011; Reuer & Lahiri, 2013). Thus, the additional legitimacy from enhanced awareness and interaction through geographic proximity established by locational choice of the SMTE, as well as continued opportunity for increasing social capital through networking of local events, provides a more positive environment for a Fearsome Five firm to become aware of an investment opportunity. Thus, stated formally we propose:

Hypothesis 5. An SMTE's closer geographic proximity to a Fearsome Five member will increase the likelihood of acquisition by that Fearsome Five member over SMTEs not located in close geographic proximity.

Method

To examine these hypotheses, we conducted an empirical analysis of high-tech firms who acquired venture funding on their path to an M&A exit with a public firm. We constructed our sample using the VentureXpert dataset from the SDC Platinum database. Our sample included all M&A deals flagged as "High Tech" in the VentureXpert dataset that were completed from 1995 to 2017. We required that the acquirer be public at the time of the acquisition, and that both the target and acquirer be based in the U.S. Additionally, we filtered out deals that did not report the number of rounds, number of private equity firms involved in the deal, or state of operations. This approach yielded a sample of 1044 M&A deals. We then divided our sample by firms acquired and not acquired by a Fearsome Five firm, given that we are interested in the effects of the oligopolistic nature of these firms on acquisition targets in the high-tech industry. Additionally, these target SMTEs acquired by the Fearsome Five were assumed to have equal chances for successful post-merger integration given the similarity based on industry, potential for organizational fit, and synergy (Bauer, Strobl, Dao, Matzler, & Rudolf, 2018).

Dependent Variable. The primary dependent variable for our logit regression model is a binary measure (F5) which takes on a value of one in the event that one of the Fearsome Five acquired the target firm and zero if the target is acquired by a firm outside the Fearsome Five.

Independent Variables. Our independent variables of interest are: TIME OF VC which measures the time in years that a target firm is first associated with a venture firm until the final purchase by a public company. NUM FUNDS is the number of venture funds involved with the target. INVESTMENT is the total amount invested by venture firms reported in thousands. INCUBATOR is an indicator for targets held by an accelerator, incubator, university, or an angel investor. BANK is an indicator for targets held by investment bank venture fund. CORP is an indicator for targets held by a corporate backed venture fund. SAME STATE is an indicator if the target is in the same state as the acquirer, a proxy for geographic distance.

Control Variables. We include controls for PRESTIGE which is an indicator that takes on a value of one if the largest venture holder is in the top 25% of total venture capital deployed by venture funds in our sample (Ragozzino & Blevins, 2016). The lead venture fund in each target is the fund with the largest dollar investment in the target. TIME TO VC is the time in years from a target's founding to the first venture investment. ROUNDS is the number of venture rounds a target experiences. CALI is an indicator that takes on a value of one if the target is headquartered in California. We also considered additional control variables commonly used in the finance literature, which we decided to omit due to lack of theoretical scope fit and statistical insignificance to our study.

In Table 1, we report the top acquirers in our sample. Microsoft and Google are the second largest

acquirers in the Fearsome Five with 37 and 20 deals, respectively. Amazon has eleven acquisitions, and Facebook and Apple each have six acquisitions.

Table 1
Top acquirers

Ticker	Count	Percent
CSCO	54	5.47
MSFT	37	3.75
GOOG	20	2.03
BRCM	16	1.62
ORCL	14	1.42
IBM	13	1.32
SYMC	13	1.32
AABA	12	1.22
AMZN	11	1.11
CRM	11	1.11
MSI	11	1.11
VRSN	7	0.71
AAPL	6	0.61
FB	6	0.61

In Table 2, we report the participation and lead frequency in deals by venture fund type. With respect to deal participation, individual private equity (PE) funds are involved with 3,905 (lead 3) deals, PE advisors and private equity funds of funds are involved with 51 (lead 838) deals, corporate backed PE funds have 791 (76), investment banks are involved with 370 (lead 35) deals, and individual investors are involved with 299 (lead 5) deals.

In Table 3, we report the summary statistics of all variables in our analysis. Approximately 7% of targets in our sample are acquired by members of the Fearsome Five, prestigious funds account for deal leads on 41% of deals, and the average deal has just under four rounds of financing. The average deal has seven venture backers, with $30.6 million in capital invested. Firms typically receive venture backing in the first three years of their life, and backers are usually involved with the firm for just under five years. In our sample, nearly half of the firms (48%) are headquartered in California and 36% of deals are between an acquirer and target in the same state.

In Table 4, we report the correlation matrix of the

Table 2
Venture group participation and leads

Venture Group Type	Participation Count	Participation %	Lead Count	Lead %
Angel Group	23	0.37	3	0.29
Bank Affiliated	370	5.89	35	3.35
Corporate PE/Venture	791	12.6	76	7.28
Endowment, Foundation or Pension Fund	43	0.68	2	0.19
Government Affiliated Program	35	0.56	7	0.67
Incubator/Development Program	35	0.56	8	0.77
Individuals	299	4.76	5	0.48
Insurance Firm Affiliate	26	0.41	1	0.1
Investment Management Firm	98	1.56	15	1.44
Non-Private Equity	4	0.06	44	4.21
Other	534	8.51	4	0.38
PE Advisor or Fund of Funds	51	0.81	838	80.27
PE Firm	3905	62.2	3	0.29
SBIC	37	0.59	3	0.29
Service Provider	15	0.24	0	0
University Program	12	0.19	0	0

Table 3
Summary statistics

	N	MEAN	SD	P25	P50	P75
F5	1044	0.07	0.25	0.00	0.00	0.00
PRESTIGE	1044	0.41	0.49	0.00	0.00	1.00
TIME TO VC	886	2.76	4.86	0.42	1.25	2.87
ROUNDS	1044	3.85	2.93	2.00	3.00	5.00
CALI	1044	0.48	0.50	0.00	0.00	1.00
TIME OF VC	1042	4.66	3.75	2.24	3.74	6.01
NUM FUNDS	1044	7.12	5.69	3.00	6.00	9.00
INVESTMENT ($000s)	1044	30590.66	43724.46	6999.85	17000.05	38560.05
INCUBATOR	1044	0.06	0.24	0.00	0.00	0.00
BANK	1044	0.23	0.42	0.00	0.00	0.00
CORP	1044	0.41	0.49	0.00	0.00	1.00
SAME STATE	1044	0.36	0.48	0.00	0.00	1.00

Table 4
Correlation matrix

	1	2	3	4	5	6
1 F5	1					
2 Prestige	0.0625*	1				
3 Time To VC	-0.0448	-0.0877**	1			
4 Rounds	-0.0624*	-0.0476	-0.150***	1		
5 Cali	0.0563	0.118***	-0.197***	0.0108	1	
6 Time Of VC	-0.0877**	-0.0324	-0.029	0.490***	-0.0517	1
7 Num Funds	-0.0748*	0.0422	-0.225***	0.658***	0.0999**	0.360***
8 Investment	-0.0709*	0.194***	0.0422	0.295***	0.0251	0.220***
9 Incubator	0.0929**	-0.0496	-0.0562	0.0278	0.00569	-0.00101
10 Bank	-0.0752*	0.0389	-0.0978**	0.308***	0.0143	0.215***
11 Corp	0.0319	0.0895**	-0.142***	0.240***	0.112***	0.111***
12 Same State	-0.0362	0.0660*	-0.137***	-0.034	0.537***	-0.0807**

	7	8	9	10	11	12
7 Num Funds	1					
8 Investment	0.433***	1				
9 Incubator	0.130***	0.00786	1			
10 Bank	0.492***	0.236***	0.0318	1		
11 Corp	0.429***	0.225***	0.0408	0.206***	1	
12 Same State	0.00996	-0.00282	-0.00828	-0.022	0.0231	1

* $p < .05$ ** $p < .01$ *** $p < .001$

variables in our main analysis.

Results

Preliminary Analysis

As part of our preliminary analysis we performed some exploratory background assessments for robustness including the trends in the overall types of investors and an industry analysis. As we depict in Figure 1, the different types of investors from 1990-2017 shows while traditional private equity and venture capital firms invests the most in SMTEs, both corporate and incubators show an increasing number of investments starting in 2013. In addition, we also assessed the trends in investment dollars and total deals, which show a negative trend in the number of overall investments. However, the year 2018 shows a dramatic increase in investment dollars. See Figure 2 for the full trend analysis.

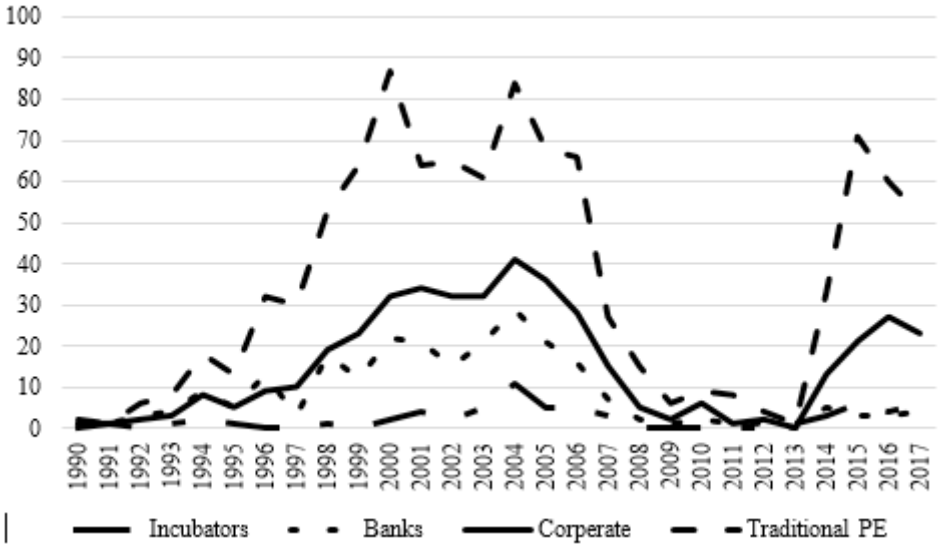

Figure 1. Deal participation

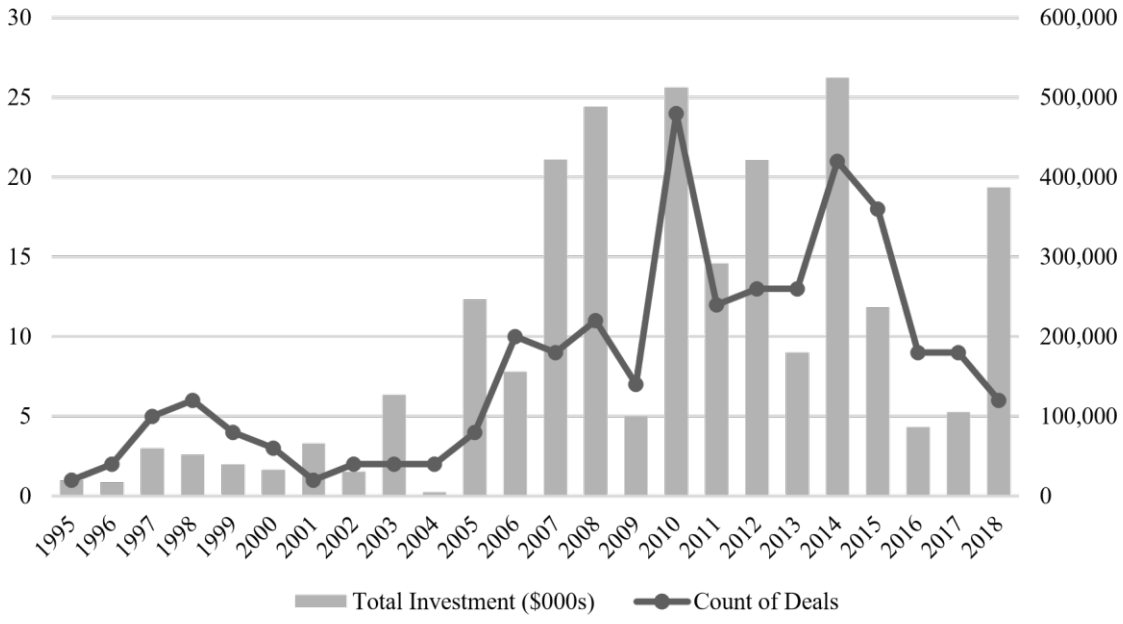

Figure 2. Deal frequency and total capital investment

When analyzing the data from an industry perspective, we also found some signs that the oligopolistic nature of the Fearsome Five seems to affect the market. See Figure 3 for the graphical representation of the deals made by the Fearsome Five each year, from 1995-2017. On the left-hand side of the graph is the collective Fearsome Five deal count done in each year; on the right-hand side of the graph is the Herfindahl-Hirschman Index (HHI), a measure of market concentration. For reference, an HHI of 1 represents a monopoly, while an HHI of 0 represents a completely free market. The Fearsome Five steadily increase the amount of deals they do in each year up to 2015, when the deals suddenly drop off by a large margin. At the same time, the HHI rapidly increases after steadily declining for the past eight years.

When looking at the entirety of M&A activity of every firm characterized as a 737 SIC code (Computer Programming, Data Processing, and other Computer Related Services) during the same period as the analysis, the total number of deals remains relatively consistent (See Figure 4). For the total number of deals performed by 737 firms in each year we depict the percentage of each total deal count that was done by only the Fearsome Five. The results show that the Fearsome Five increasingly hold a higher and higher percentage of all 737 M&A activity up until 2015, when it drops and remains lower than previous years. These results support our initial arguments that Fearsome Five acquisition activity will decrease as the industry concentration grows.

Regression Analysis. To formally test our hypotheses we use a logit regression model with the following form:

$$Pr(F5) = a + b*Variable\ of\ Interest_i + X*CONTROLS_i + e_i \quad (1)$$

where the dependent variable is the indicator F5 which takes on a value of 1 if the acquirer is in the Fearsome Five and zero otherwise. Our control set includes controls for deal lead prestige (PRESTIGE), length of time in years to first venture investment from firm formation (TIME TO VC), number of venture rounds during the deal (ROUNDS), and an indicator if the target is in California (CALI).

We report the results of our analysis in Table 5.

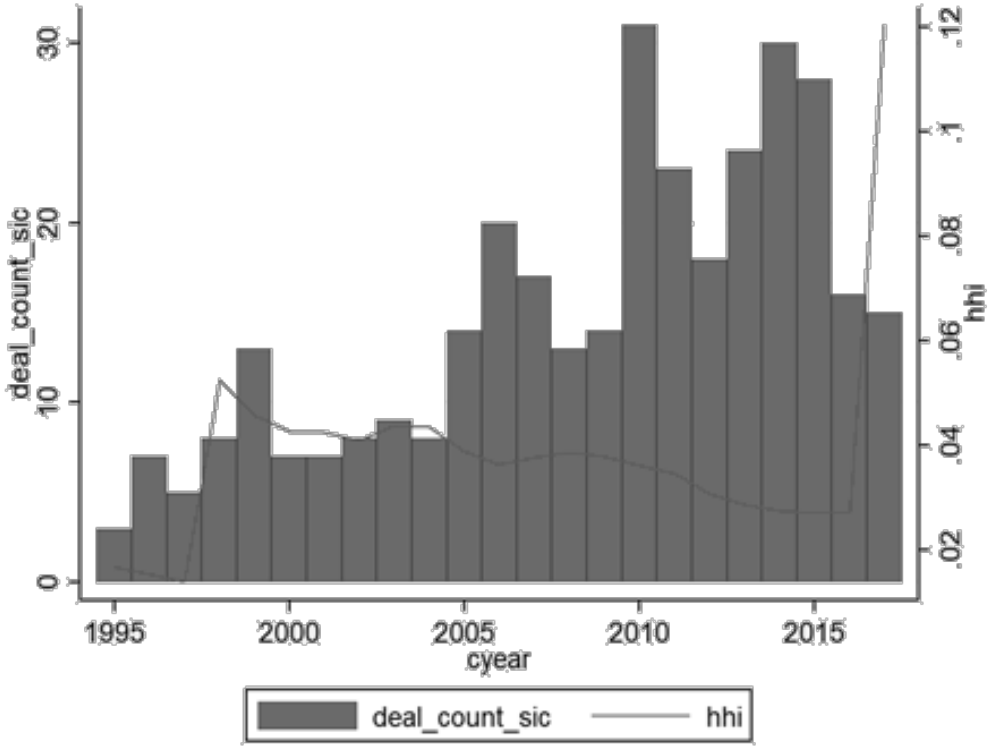

Figure 3. Fearsome five deals

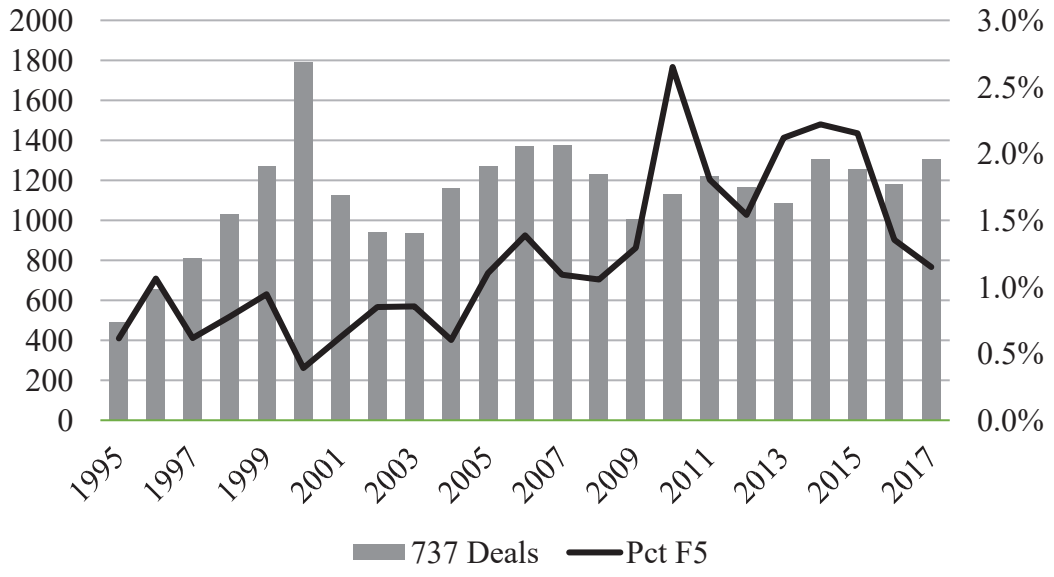

Figure 4. 737 SIC and F5 M&A activity

The cells report the marginal effects of the logit models and p-values. In Column 1 of Table 5, we report the results of our model with only the control variables included. In Column 2 of Table 5, we depict the test our first hypothesis that the F5 prefer firms earlier in the VC cycle by including the time of venture participation (TIME OF VC) with the firm in years. This variable loads negative and significant at the 5% level, supporting our first hypothesis. The marginal effect suggest that a one year increase in TIME OF VC leads to 70 basis point decrease in the probability of being acquired. In Column 3 of Table 5 we test our second hypothesis that the F5 prefer firms with fewer venture participants by including the number of venture investors (NUM FUNDS). This variable loads negative and significant at the 5% level, supporting our second hypothesis. The marginal effect suggests that increasing the number of investors by one fund reduces the probability of being acquired by 50 basis points. In Column 4 of Table 5 we test our third hypothesis that the F5 prefer firms with lower venture investment by including the total amount of venture investment (INVESTMENT). For this model we scale INVESTMENT to millions to adjust the reported coefficient. Thus, the marginal effect implies that each additional $1 million invested reduces the probably of acquisition by 1.7%. This variable loads negative and significant at the 1% level, supporting our third hypothesis.

In Column 5 of Table 5 we test our fourth hypothesis that the F5 prefer firms from incubator to other types of backing by including INCUBATOR, BANK, and CORP. Each of these variables is an indicator that takes on a value of 1 if the target has backing from an incubator venture fund, investment banking venture fund, or a corporate backed venture fund. INCUBATOR loads positive and significant at the 5% level, supporting our fourth hypothesis that Fearsome Five firms prefer targets who participate in Accelerators and Incubators. The marginal effect implies that participation with an incubator increases the probability of acquisition by 9.7%. BANK is negative and significant at the 5% level, which provides additional support in comparison the Fearsome Five firms do not acquire targets with investment bank funding. The marginal effect implies that investment bank backing decreases the probably of acquisition by a fearsome five by 3.5%.

In Column 6 of Table 5 we test our fifth hypothesis that the F5 prefer firms located close in geographic proximity by including SAME STATE, which takes on a value of 1 if the target and acquirer are in the same state. This variable loads negative and significant at the 1% level, not supporting our fifth hypothesis, and the marginal effect implies that the probability of acquisition of from an F5 firm is lower by 4.2%. Finally, in Column 7 we include all of our hypothesized variables in the same model. The statistical significance and direction remains consistent in the full model on the majority of our independent variables of interest at

Table 5
Logit models

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Prestige	0.017	0.016	0.017	0.026*	0.019	0.016	0.019
	(0.296)	(0.301)	(0.249)	(0.086)	(0.215)	(0.280)	(0.134)
Time To VC	-0.004	-0.003	-0.004*	-0.004	-0.003	-0.004	-0.003
	(0.140)	(0.196)	(0.070)	(0.129)	(0.158)	(0.105)	(0.116)
Rounds	-0.007**	-0.002	0.000	-0.002	-0.005	-0.007**	0.004
	(0.042)	(0.697)	(0.981)	(0.415)	(0.119)	(0.025)	(0.191)
Cali	0.009	0.007	0.011	0.010	0.007	0.030*	0.028*
	(0.564)	(0.624)	(0.450)	(0.489)	(0.614)	(0.072)	(0.050)
Time Of VC		-0.007**					-0.005*
		(0.042)					(0.052)
Num Funds			-0.005**				-0.004**
			(0.010)				(0.043)
Investment				-0.017***			-0.000
				(0.008)			(0.209)
Incubator					0.097**		0.099**
					(0.039)		(0.036)
Bank					-0.035**		-0.012
					(0.015)		(0.440)
Corp					0.012		0.020
					(0.410)		(0.121)
Same State						-0.042***	-0.035***
						(0.005)	(0.005)
Observations	886	885	886	886	886	886	885

* $p < .05$ **$p < .01$ ***$p < .001$

the 5% level. The two exceptions are TIME TO VC, which is only significance at the 10% level, and INVESTMENT, which is insignificant. Given significant, positive pairwise correlation of INVESTMENT and NUM FUNDS reported in Table 3, it is likely that the multicolinearlity of these two variables explains the loss of significance on INVESTMENT in the results depicted in the full model in Column 7 of Table 5.

Discussion

One popular question SMTEs are interested in answering is "What is their path to riches?" Based on investment trends and the current projected role of consolidation of power and financial resources in the high-tech industry, SMTEs that are involved with incubators, have less investment dollars and fewer investors, and less time working with the investors, have a higher likelihood of exiting via acquisition by a Fearsome Five member. Given our analysis, we conclude that the sheer market power of the Fearsome Five has crowded out other high-tech firms, decreasing the industry complexity. There is currently limited room for another high-tech firm to make a splash in the market, leading to fewer ventures, and thus less M&A activity.

Academic Implications

Based on our theoretical integration of RBV and environmental uncertainty, our results offer several academic implications. First, expanding on the boundary conditions of RBV and environmental uncertainty, we show the limitations of SMTEs financial capital competitive advantage when looking for entrepreneurial exit via M&A. As industry complexity decreases, while opportunities for funding may still exist, if the top firms within the industry perform all acquisitions, less, not more, venture capital funding is preferred. Less M&A activity with a sudden increase in market concentration is concerning, to say the least. The conversation amongst industry insiders, financial analysts, and the general populace must now be one centered on the health of the high-tech industry. Do we really want five firms controlling a market that has increasingly greater sway upon everyday life?

Historically, such a market situation has led to higher prices and lower quality. The same results may be true for this market situation, with the addition of yet another noxious effect: less privacy. The concentration of firms in control of hundreds of millions of users' data makes them a target for hacking (Kshetri, 2014), and without a high level of security could be a recipe for disaster (Dawson, 2018; Schneier, 2011; Straub & Welke, 1998). One need only look at FaceBook's various data scandals that have rattled investors, users, and regulators. The ongoing concerns over the intrusion in to the home of the internet of things (IOT) and AI-based home and office automation platforms from Amazon, Google, Apple, and others leading to discussions not only about privacy and data usage but also about the very foundation of modern life (Solon & Laughland, 2018). It is not in the scope of this paper to discuss and attempt to resolve each of these possible implications and how their potentially catastrophic privacy rights and market implications could be remedied. It is in the scope of this paper, however, to suggest that this discussion be hurried and aided by much additional research and examination in the near future.

Practical Implications

One consideration for investors and policy makers is the potential impact of the consolidation of the high-tech industry related to the outcomes of acquisitions of SMTEs. For example, local community investors look to invest in start-ups and SMEs to encourage local community growth through employment and productive output (Islam et al., 2018). While this may be the case for SMTEs, after acquisition, the local economy is dependent on the actions of the Fearsome Five or other acquirer choices on whether support the growth SMTE in their current location. If the trend of acquisition of SMTEs shows a lack of giving back to the local community, while larger investors may receive a return, a negative trend may begin with the lack of initial investments in start-up (Decker et al., 2016). This negative cycle, or death spiral, could thus result in a reduction of high-tech start-ups receiving the financial support they need to grow into SMTEs, which results in a lack of options for VCs and thus for large high-tech firms like the Fearsome Five for acquisition. While such a death spiral is a very pessimistic viewpoint, both scholars and industry practitioners suggest this potential outcome is likely to occur over the next 30 years (Andriole, 2017).

Limitations

We encourage some caution in interpreting these results. While they show support that the Fearsome Five acquire SMTEs earlier in the investment funding process, we do not account for the outcome of the acquisition. In addition, the changing nature of the M&A activity by the Fearsome Five provides another reason to pause and assess if exit via acquisition by a Fearsome Five member in the future is as likely and promising as it has been. Another limitation to this study is the use of only investment funding provided by those that are listed in the XPERT database, which does not include debt or classify other types of equity funding. SMTEs that also utilize grants, or other terms of accelerator or crowdfunding resources that may or may not be associated with either debt or equity financing not included in EXPERT could provide additional insights to the financial path from start-up to acquisition (Drover et al., 2017).

Another avenue not explored in this paper that could provide additional insights into the future role of investment funding in entrepreneur exit is the changes in the investment environment over time. For example,

as the number and type of financial investors increases, the number of SMTE acquisitions may increase given the observed significant relationship between SMTE's gaining funding and acquisition exit. However, the trend of different types of investments over time both in terms of growth in the different categories of investment types and the increasing number in volume and dollar needs further analysis. Both scholars and practitioners may find this future avenue of research interesting as it could foreshadow both the role of growing investment firms and the role the Fearsome Five may play going forward.

Future Research

Some open questions not addressed in our analysis include how the role of acquirer motives and their actions post-acquisition may further affect the industry and subsequent future investment opportunities. We identify the increasing trend of investments by the Fearsome Five up until 2015 and then a subsequent decline is noted. While some of this decline can likely be explained by the decrease in M&As in general due to the waning of the M&A wave (Park, Morel, & Madhavan, 2010), other reasons for a decline could be a lack of SMTEs to acquire or lack of interest by SMTEs for acquisition. For example, recent negative media may serve as a disincentive to SMTEs to pursue acquisition if culture or customer privacy are as or more important than financial incentives (Strese et al., 2018). SMTEs may view recent issues the Fearsome Five have had with data privacy (e.g., MacMillian & McMillian, 2018; Solon & Laughland, 2018) or the issues of culture and support for diversity (e.g., Edwards, 2016; Seetharaman, 2018; Waters, 2018) as negative factors and may choose to explore other alternatives for exit. For example, SMTEs may instead decide given these issues to explore utilizing the additional investment funding to pursue their own acquisition opportunities for further growth (e.g., Celikyurt, Sevilir, & Shivdasani, 2010; Ng & Al-Shaghroud, 2018).

Additional future research directions may include a deeper investigation into HHI: What are the top firms making up the HHI index? Which of the Fearsome Five has the greatest market power? Future research may also be conducted around the choice of Fearsome Five targets. Are Fearsome Five member firms more often targeting public or private firms, and why? Finally, researchers may seek to find out whether the rest of the high-tech sector will follow the Fearsome Five's M&A activity. Will M&A activity plummet like the Five's has in recent years?

Conclusion

Through this study, we offered a greater understanding of the potential impact of how financial investments can influence an entrepreneurs exit via an M&A by that of the Fearsome Five in the high-tech industry. While SMTEs strive to overcome financial challenges by raising capital through one or many investment funding opportunities, we highlight the importance of the source and timing of those funds if the SMTE is looking to attract the attention of the top five firms in the high-tech industry. A more thorough understanding will lead to far-reaching implications for the rest of high-tech industry and business and society in general. For example, another practical implication includes possible governmental oversight and new policy to help encourage the growth and funding of SMTEs or mitigate potential negative impacts of the power held by the Fearsome Five. Expanded understanding of whether or not potential targets should decide to merge with a Fearsome Five member, and how the market power of the Fearsome Five affects the high-tech industry, and, as aforementioned, the political and societal effects of such an oligopolistic market is an important implications for practitioners and scholars.

References

Achtenhagen, L., Brunninge, O., & Melin, L. (2017). Patterns of dynamic growth in mediumsized companies: Beyond the dichotomy of organic versus acquired growth. *Long Range Planning, 50*(4), 457-471.

Albort-Morant, G., & Oghazi, P. (2016). How useful are incubators for new entrepreneurs? *Journal of Business Research, 69*(6), 2125-2129.

Anderson, P., & Tushman, M. L. (2001). Organizational environments and industry exit: The effects of uncertainty, munificence and complexity. *Indus-*

trial and Corporate Change, 10(3), 675-711.

Andriole, S. (2017). There will be 30 technology companies in 2030, 10 in 2050, and then there will be none. *Forbes*. Retrieved from https://www.forbes.com/sites/steveandriole/2017/05/25/there-will-be-20-technology-companies-in-2030-10-in-2050-and-then-there-will-be-none/

Authers, J. (2017). Year in a word: Fangs. *Financial Times*. Retrieved from www.ft.com/content/414b5882-e41b-11e7-8b99-0191e45377ec_

Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*(1), 99-120.

Baron, R. A., Franklin, R. J., & Hmieleski, K. M. (2016). Why entrepreneurs often experience low, not high, levels of stress: The joint effects of selection and psychological capital. *Journal of Management, 42*(3), 742-768.

Bauer, F., & Matzler, K. (2014). Antecedents of M&A success: The role of strategic complementarity, cultural fit, and degree and speed of integration. *Strategic Management Journal, 35*(2), 269-291. doi:10.1002/smj.2091

Bauer, F., Strobl, A., Dao, M. A., Matzler, K., & Rudolf, N. (2018). Examining links between pre and post M&A value creation mechanisms — Exploitation, exploration and ambidexterity in Central European SMEs. *Long Range Planning, 51*(2), 185-203. doi:10.1016/j.lrp.2016.07.002

Bendickson, J., Davis, P. E., Cowden, B. J., & Liguori, E. W. (2015). Why small firms are different: Addressing varying needs from boards of directors. *Journal of Small Business Strategy, 25*(2), 41-58.

Berbegal-Mirabent, J., Ribeiro-Soriano, D. E., & García, J. L. S. (2015). Can a magic recipe foster university spin-off creation? *Journal of Business Research, 68*(11), 2272-2278.

Biery, M. E. (2017). The 10 fastest-growing industries in the U.S. *Forbes*. Retrieved from https://www.forbes.com/sites/sageworks/2017/04/09/the-10-fastest-growing-industriesin-the-u-s/#296133481ef2

Blevins, D. P., Ragozzino, R., & Reuer, J. J. (2017). How the JOBS Act is reshaping IPOs: Implications for entrepreneurial firms. *Academy of Management Perspectives, 31*(2), 109-123.

Blonigen, B. A., & Taylor, C. T. (2000). R&D intensity and acquisitions in high-technology industries: Evidence from the US electronic and electrical equipment industries. *The Journal of Industrial Economics, 48*(1), 47-70.

Boso, N., Story, V. M., Cadogan, J. W., Micevski, M., & Kadic-Maglajlic, S. (2012). Firm innovativenesss and export performance: Environmental, networking, and structural contigencies. *Journal of International Marketing, 21*(4), 62-87.

Bradshaw, T. (2017). Tech world's 'fearsome five' top most valuable brands list. *Financial Times*. Retrieved from www.ft.com/content/5692ad90-47df-11e7-8519-9f94ee97d996

Bruner, R. F. (1988). The use of excess cash and debt capacity as a motive for merger. *Journal of Financial and Quantitative Analysis, 23*(2), 199-217.

Bruns, V., Holland, D. V., Shepherd, D. A., & Wiklund, J. (2008). The role of human capital in loan officers' decision policies. *Entrepreneurship Theory and Practice, 32*(3), 485-506.

Brush, T. H., Bromiley, P., & Hendrickx, M. (2000). The free cash flow hypothesis for sales growth and firm performance. *Strategic Management Journal, 21*(4), 455-472.

Carpentier, C., & Suret, J. M. (2015). Angel group members' decision process and rejection criteria: A longitudinal analysis. *Journal of Business Venturing, 30*(6), 808-821.

Carper, W. B. (1990). Corporate acquisitions and shareholder wealth: A review and exploratory analysis. *Journal of Management, 16*(4), 807-823.

Carsrud, A., & Brännback, M. (2011). Entrepreneurial motivations: What do we still need to know? *Journal of Small Business Management, 49*(1), 9-26.

Caruso, A. (2012). Statistics of U.S. businesses employment and payroll summary: 2012. Retrieved from https://www.census.gov/content/dam/Census/library/publications/2015/econ/g12susb.pdf

Celikyurt, U., Sevilir, M., & Shivdasani, A. (2010). Going public to acquire? The acquisition motive in IPOs. *Journal of Financial Economics, 96*(3), 345-363. doi:10.1016/j.jfineco.2010.03.003

Chandler, G. N., & Hanks, S. H. (1994). Market attrac-

tiveness, resource-based capabilities, venture strategies, and venture performance. *Journal of Business Venturing, 9*(4), 331-349.

Chen, C. J. (2009). Technology commercialization, incubator and venture capital, and new venture performance. *Journal of Business Research, 62*(1), 93-103.

Christensen, C. M., Alton, R., Rising, C., & Waldeck, A. (2011). The big idea: The new M&A playbook. *Harvard Business Review, 89*(3), 48-57.

Cohen, S. (2013). What do accelerators do? Insights from incubators and angels. *Innovations: Technology, Governance, Globalization, 8*(3-4), 19-25.

Collewaert, V. (2012). Angel investors' and entrepreneurs' intentions to exit their ventures: A conflict perspective. *Entrepreneurship Theory and Practice, 36*(4), 753-779.

Colombo, M. G., Franzoni, C., & Rossi-Lamastra, C. (2015). Internal social capital and the attraction of early contributions in crowdfunding. *Entrepreneurship Theory and Practice, 39*(1), 75-100.

Curry, B., & George, K. D. (1983). Industrial concentration: A survey. *The Journal of Industrial Economics, 31*(3), 203-255.

D'Souza, R., & Kemelgor, B. (2008). Does expertise matter in an ever-changing and uncertain environment? A study of the entrepreneurial process of serial and novice entrepreneurs. *Journal of Small Business Strategy, 19*(2), 69-87.

Dada, O., & Fogg, H. (2014). Organizational learning, entrepreneurial orientation, and the role of university engagement in SMEs. *International Small Business Journal, 34*(1), 86-104. doi:10.1177/0266242614542852

Dalton, D. R., Todor, W. D., Spendolini, M. J., Fieldingg, G. J., & Porter, L. W. (1980). Organization structure and performance: A critical review. *Academy of Management Review, 5*(1), 49-54.

Dawson, M. (2018). Cyber security in industry 4.0: The pitfalls of having hyperconnected systems. *Journal of Strategic Management Studies, 10*(1), 19-28.

Deans, G. K., Kroeger, F., & Zeisel, S. (2002). The consolidation curve. *Harvard Business Review*, 20-22.

Decker, R. A., Haltiwanger, J., Jarmin, R. S., & Miranda, J. (2016). Where has all the skewness gone? The decline in high-growth (young) firms in the US. *European Economic Review, 86*, 4-23.

Deeds, D. L., Mang, P. Y., & Frandsen, M. L. (2004). The influence of firms' and industries' legitimacy on the flow of capital into high-technology ventures. *Strategic Organization, 2*(1), 9-34. doi:10.1177/1476127004040913

Dempwolf, C. S., Auer, J., & D'Ippolito, M. (2014). Innovation accelerators: Defining characteristics among startup assistance organizations. *Small Business Administration*. Retrieved from https://www.sba.gov/sites/default/.../rs425-Innovation-Accelerators-Report-FINAL.pdf

DeSantola, A., & Gulati, R. (2017). Scaling: Organizing and growth in entrepreneurial ventures. *Academy of Management Annals, 11*(2), 640-668. doi:10.5465/annals.2015.0125

Dess, G. G., & Beard, D. W. (1984). Dimensions of organizational task environments. *Administrative Science Quarterly, 29*(1), 52-73.

DeTienne, D. R., McKelvie, A., & Chandler, G. N. (2015). Making sense of entrepreneurial exit strategies: A typology and test. *Journal of Business Venturing, 30*(2), 255-272.

Dolata, U. (2017). *Apple, Amazon, Google, Facebook, Microsoft: Market concentration - competition - innovation strategies*. Retrieved from https://econpapers.repec.org/paper/zbwstusoi/201701.htm

Droege, S. B., & Marvel, M. R. (2009). Perceived strategic uncertainty and strategy formation in emerging markets. *Journal of Small Business Strategy, 20*(2), 43-60.

Drover, W., Busenitz, L., Matusik, S., Townsend, D., Anglin, A., & Dushnitsky, G. (2017). A review and road map of entrepreneurial equity financing research: venture capital, corporate venture capital, angel investment, crowdfunding, and accelerators. *Journal of Management, 43*(6), 1820-1853. doi:10.1177/0149206317690584

Ebbers, J. J. (2014). Networking behavior and contracting relationships among entrepreneurs in business incubators. *Entrepreneurship Theory and Practice, 38*(5), 1-23.

Edwards, J. (2016). Google employees confess all the things they hated most about working at

Google. Retrieved from https://www.businessinsider.com/google-employees-worstthings-about-working-at-google-2016-12

Elitzur, R., & Gavious, A. (2003). Contracting, signaling, and moral hazard: A model of entrepreneurs,'angels,'and venture capitalists. *Journal of Business Venturing, 18*(6), 709-725.

Fairchild, R. (2011). An entrepreneur's choice of venture capitalist or angel-financing: A behavioral game-theoretic approach. *Journal of Business Venturing, 26*(3), 359-374.

Franke, N., Gruber, M., Harhoff, D., & Henkel, J. (2006). What you are is what you like— similarity biases in venture capitalists' evaluations of start-up teams. *Journal of Business Venturing, 21*(6), 802-826.

Gabrielsson, J., & Politis, D. (2011). Career motives and entrepreneurial decision-making: Examining preferences for causal and effectual logics in the early stage of new ventures. *Small Business Economics, 36*(3), 281-298.

Galbraith, C. S., & Stiles, C. H. (1984). Merger strategies as a response to bilateral market power. *Academy of Management Journal, 27*(3), 511-524.

Gnyawali, D. R., & Park, B. J. (2009). Co-opetition and technological innovation in small and medium-sized enterprises: A multilevel conceptual model. *Journal of Small Business Management, 47*(3), 308-330.

Graebner, M. E., Eisenhardt, K. M., & Roundy, P. T. (2010). Success and failure in technology acquisitions: Lessons for buyers and sellers. *Academy of Management Perspectives, 24*(3), 73-92.

Grimpe, C., & Hussinger, K. (2014). Resource complementarity and value capture in firm acquisitions: The role of intellectual property rights. *Strategic Management Journal, 35*(12), 1762-1780. doi:10.1002/smj.2181

Hagedoorn, J., & Duysters, G. (2002). External sources of innovative capabilities: The preference for strategic alliances or mergers and acquisitions. *Journal of Management Studies, 39*(2), 167-180.

Hallen, B. L., Bingham, C. B., & Cohen, S. (2014). Do accelerators accelerate? A study of venture accelerators as a path to success? *Academy of Management Proceedings*, *2014*(1) 12955.

Hansell, G., Walker, D., & Kengelbach, J. (2014). Lessons from successful serial acquirers: Unlocking acquisition growth. Retrieved from https://www.bcg.com/publications/2014/mergers-acquisitions-unlocking-acquisitivegrowth.aspx

Helfat, C. E., & Martin, J. A. (2015). Dynamic managerial capabilities: Review and assessment of managerial impact on strategic change. *Journal of Management, 41*(5), 1281-1312. doi:10.1177/0149206314561301

Hitt, M. A., Hoskisson, R. E., & Ireland, R. D. (1990). Mergers and acquisitions and managerial commitment to innovation in M-form firms. *Strategic Management Journal, 11,* 29-47.

IMAA. (2018). M&A in the United States. Retrieved from https://imaa-institute.org/m-and-a-usunited-states/

Isabelle, D. D. (2013). Key factors affecting a technology entrepreneur's choice of incubator or accelerator. *Technology Innovation Management Review*, 16-22.

Islam, M., Fremeth, A., & Marcus, A. (2018). Signaling by early stage startups: US government research grants and venture capital funding. *Journal of Business Venturing, 33*(1), 35-51.

Kanbach, D. K., & Stubner, S. (2016). Corporate accelerators as recent form of startup engagement: The what, the why, and the how. *Journal of Applied Business Research, 32*(6), 1761.

Kashiramka, S., & Rao, N. M. (2014). Shareholders' wealth effects of mergers and acquisitions on acquiring firms in the Indian IT and ITeS sector. *South Asian Journal of Management, 21*(3), 140-166.

Kaul, A., & Wu, B. (2016). A capabilities-based perspective on target selection in acquisitions. *Strategic Management Journal, 37*(7), 1220-1239. doi:10.1002/smj.2389

Kengelbach, J., Klemmer, D. C., Schwetzler, B., & Sperling, M. O. (2012). An anatomy of serial acquirers, M&A learning, and the role of post-merger integration. *SSRN, December 10, 2012,* 1-47. https://ssrn.com/abstract=1946261 or http://dx.doi.org/10.2139/ssrn.1946261

King, D. R., Bauer, F., & Schriber, S. (2018). *Mergers & acquisitions: A research overview*. New York, NY: Routledge.

King, D. R., Dalton, D. R., Daily, C. M., & Covin, J. G. (2004). Meta-analyses of postacquisition performance: Indications of unidentified moderators. *Strategic Management Journal, 25*(2), 187-200. doi:10.1002/smj.371

Kohers, N., & Kohers, T. (2000). The value creation potential of high-tech mergers. *Financial Analysts Journal, 56*(3), 40-50.

Kohler, T. (2016). Corporate accelerators: Building bridges between corporations and startups. *Business Horizons, 59*(3), 347-357.

Kollmann, T., & Kuckertz, A. (2010). Evaluation uncertainty of venture capitalists' investment criteria. *Journal of Business Research, 63*(7), 741-747.

Kshetri, N. (2014). Big data′ s impact on privacy, security and consumer welfare. *Telecommunications Policy, 38*(11), 1134-1145.

La Monica, P. (2017). Tech's top five now worth more than $3 trillion. *CNN Money*. Retrieved from money.cnn.com/2017/10/31/investing/apple-google-alphabet-microsoftamazon-facebook-tech/index.html

Laamanen, T., & Keil, T. (2008). Performance of serial acquirers: Toward an acquisition program perspective. *Strategic Management Journal, 29*(6), 663-672. doi:10.1002/smj.670

Lander, M. (2012). Obama signs bill to promote startup investments. *New York Times*. Retrieved from https://www.nytimes.com/2012/04/06/us/politics/obama-signs-bill-toease-investing-in-startups.html

Li, L., Qian, G., & Qian, Z. (2012). The performance of small and medium-sized technology-based enterprises: Do product diversity and international diversity matter? *International Business Review, 21*(5), 941-956.

Liao, J. J., Welsch, H., & Moutray, C. (2008). Startup resources and entrepreneurial discontinuance: The case of nascent entrepreneurs. *Journal of Small Business Strategy, 19*(2), 1-16.

Love, J. H., & Roper, S. (1999). The determinants of innovation: R & D, technology transfer and networking effects. *Review of Industrial Organization, 15*(1), 43-64.

Lumpkin, G. T., & Dess, G. G. (2001). Linking two dimensions of entrepreneurial orientation to firm performance: The moderating role of environment and industry life cycle. *Journal of Business Venturing, 16*, 429-451.

Lyons, E., & Zhang, L. (2018). Who does (not) benefit from entrepreneurship programs? *Strategic Management Journal, 39*(1), 85-112.

M'Chirgui, Z. (2009). Dynamics of R&D networked relationships and mergers and acquisitions in the smart card field. *Research Policy, 38*(9), 1453-1467.

MacMillian, D., & McMillian, R. (2018). Google exposed user data, feared repercussions of disclosing to public. *The Wall Street Journal*. Retrieved from https://www.wsj.com/articles/google-exposed-userdata-feared-repercussions-of-disclosing-to-public-1539017194

Makri, M., Hitt, M. A., & Lane, P. J. (2010). Complementary technologies, knowledge relatedness, and invention outcomes in high technology mergers and acquisitions. *Strategic Management Journal, 31*(6), 602-628. doi:10.1002/smj.829

Malek, K., Maine, E., & McCarthy, I. P. (2014). A typology of clean technology commercialization accelerators. *Journal of Engineering and Technology Management, 32*, 26-39.

Manjoo, F. (2016). Tech's 'frightful 5' will dominate digital life for foreseeable future. *The New York Times*. Retrieved from https://www.nytimes.com/2016/01/21/technology/techsfrightful-5-will-dominate-digital-life-for-foreseeable-future.html

Mantecon, T., & Thistle, P. D. (2011). The IPO market as a screening device and the going public decision: Evidence from acquisitions of privately and publicly held firms. *Review of Quantitative Finance and Accounting, 37*(3), 325-361.

McKelvie, A., & Davidsson, P. (2009). From resource base to dynamic capabilities: An investigation of new firms. *British Journal of Management, 20*, S63-S80. doi:10.1111/j.1467-8551.2008.00613.x

Mitteness, C. R., Baucus, M. S., & Norton Jr, W. I. (2013). Establishing cognitive legitimacy in emerging organizations: The role of prestige. *Journal of Small Business Strategy, 23*(1), 71-92.

Mitteness, C. R., Sudek, R., & Cardon, M. S. (2012). Angel investor characteristics that determine

whether perceived passion leads to higher evaluations of funding potential. *Journal of Business Venturing, 27*(5), 592-606.

Moeller, S. B., Schlingemann, F. P., & Stulz, R. M. (2005). Wealth destruction on a massive scale? A study of acquiring-firm returns in the recent merger wave. *Journal of Finance, 60*(2), 757-782.

Mollick, E. (2014). The dynamics of crowdfunding: An exploratory study. *Journal of Business Venturing, 29*(1), 1-16.

Murnieks, C. Y., Haynie, J. M., Wiltbank, R. E., & Harting, T. (2011). 'I like how you think': similarity as an interaction bias in the investor–entrepreneur dyad. *Journal of Management Studies, 48*(7), 1533-1561.

Ng, W., & Al-Shaghroud, M. (2018). Strategy-as-coping in medium-sized enterprises: A social process of collective sensing for acquisition opportunities. *Journal of Small Business Strategy, 28*(2), 16-32.

Nilsen, Ø. A., Sørgard, L., & Ulsaker, S. A. (2016). Upstream merger in a successive oligopoly: Who pays the price? *International Journal of Industrial Organization, 48*, 143-172. doi:10.1016/j.ijindorg.2016.06.003

Nouri, P., & Ahmady, A. (2018). A taxonomy of nascent entrepreneurs' marketing decisions in high-tech small businesses. *Journal of Small Business Strategy, 28*(3), 69-79.

Pagano, M., Panetta, F., & Zingales, L. (1996). The stock market as a source of capital: Some lessons from initial public offerings in Italy. *European Economic Review, 40*(3), 10571069.

Parida, V., Westerberg, M., & Frishammar, J. (2012). Inbound open innovation activities in hightech SMEs: The impact on innovation performance. *Journal of Small Business Management, 50*(2), 283-309.

Park, J. W., Morel, B., & Madhavan, R. (2010). Riding the wave: Self-organized criticality in M&A waves. *Academy of Management Proceedings, 2010*(1), 1-6.

Pauwels, C., Clarysse, B., Wright, M., & Van Hove, J. (2016). Understanding a new generation incubation model: The accelerator. *Technovation, 50*, 13-24.

Peake, W. O., & D'Souza, D. (2015). Toward an integrative research framework for new venture legitimacy judgement formation. *Journal of Small Business Strategy, 25*(1), 82-104.

Porter, M. E. (1979). How competitive forces shape strategy. *Harvard Business Review, March*, 1-10.

Prive, T. (2012). Inside The JOBS Act: Equity crowdfunding. *Forbes*. Retrieved from https://www.forbes.com/sites/tanyaprive/2012/11/06/inside-the-jobs-act-equitycrowdfunding-2/#e6391524b2e7

Qian, G., & Li, L. (2003). Profitability of small- and medium-sized enterprises in high-tech industries: The case of the biotechnology industry. *Strategic Management Journal, 24*(9), 881-887.

Ragozzino, R., & Blevins, D. P. (2016). Venture–backed firms: How does venture capital involvement affect their likelihood of going public or being acquired? *Entrepreneurship Theory and Practice, 40*(5), 991-1016.

Ragozzino, R., & Reuer, J. J. (2007). Initial public offerings and the acquisition of entrepreneurial firms. *Strategic Organization, 5*(2), 155-176.

Ragozzino, R., & Reuer, J. J. (2011). Geographic distance and corporate acquisitions: Signals from IPO firms. *Strategic Management Journal, 32*(8), 876-894.

Ransbotham, S., & Mitra, S. (2010). Target age and the acquisition of innovation in hightechnology industries. *Management Science, 56*(11), 2076-2093.

Reuer, J. J., & Lahiri, N. (2013). Searching for alliance partners: Effects of geographic distance on the formation of R&D collaborations. *Organization Science, 25*(1), 283-298.

Roig-Tierno, N., Alcazar, J., & Ribeiro-Navarrete, S. (2015). Use of infrastructures to support innovative entrepreneurship and business growth. *Journal of Business Research, 68*(11), 2290-2294.

Rosenbusch, N., Brinckmann, J., & Müller, V. (2013). Does acquiring venture capital pay off for the funded firms? A meta-analysis on the relationship between venture capital investment and funded firm financial performance. *Journal of Business Venturing, 28*(3), 335-353.

Salvo, A. (2010). Sequential cross-border mergers in models of oligopoly. *Economica, 77*(306), 352-

383. doi:10.1111/j.1468-0335.2008.00754.x

Schenkel, M. T., Farmer, S., & Maslyn, J. M. (2019). Process improvement in SMEs: The impact of harmonious passion for entrepreneurship, employee creative self-efficacy, and time spent innovating. *Journal of Small Business Strategy, 29*(1), 64-77.

Schneier, B. (2011). *Secrets and lies: Digital security in a networked world*. Indianapolis, IN: Wiley Publishing Inc.

Seetharaman, D. (2018, November 14). Facebook morale takes a tumble along with stock price. *The Wall Street Journal*. Retrieved from https://www.wsj.com/articles/facebook-morale-takes-atumble-along-with-stock-price-1542200400?mod=-searchresults&page=1&pos=3

Sequeira, J. M., Weeks, K. P., Bell, M. P., & Gibbs, S. R. (2018). Making the case for diversity as a strategic business tool in small firm survival and success. *Journal of Small Business Strategy, 28*(3), 31-47.

Shane, S., Locke, E. A., & Collins, C. J. (2003). Entrepreneurial motivation. *Human Resource Management Review, 13*(2), 257-279.

Simpson, M., Padmore, J., & Newman, N. (2012). Towards a new model of success and performance in SMEs. *International Journal of Entrepreneurial Behavior & Research, 18*(3), 264-285.

Slevin, D. P., & Covin, J. G. (1998). Time, growth, complexity, and transitions: Entrepreneurial challenges for the future. *Entrepreneurship Theory and Practice, 22*(2), 53-68.

Small Business & Entrepreneurship Council. (2016). *Facts & data on small business and entrepreneurship: American business is overwhelmingly small business.* Retrieved from http://sbecouncil.org/about-us/facts-and-data/

Solon, O., & Laughland, O. (2018). Cambridge Analytica closing after Facebook data harvesting scandal. *The Guardian, Cambridge Analytica: The Cambridge Analytica Files.* Retrieved from https://www.theguardian.com/uk-news/2018/may/02/cambridge-analytica-closingdown-after-facebook-row-reports-say

Spigel, B., & Harrison, R. (2018). Toward a process theory of entrepreneurial ecosystems. *Strategic Entrepreneurship Journal, 12*(1), 151-168.

Straub, D. W., & Welke, R. J. (1998). Coping with systems risk: Security planning models for management decision making. *MIS Quarterly*, *22*(4), 441-469.

Strese, S., Gebhard, P., Feierabend, D., & Brettel, M. (2018). Entrepreneurs' perceived exit performance: Conceptualization and scale development. *Journal of Business Venturing, 33*(3), 351-370.

Sudek, R. (2006). Angel investment criteria. *Journal of Small Business Strategy, 17*(2), 89-104.

Thornhill, S., & Amit, R. (2003). Learning about failure: Bankruptcy, firm age, the resourcebased view. *Organization Science, 14*(5), 497-509.

Tracey, P., Dalpiaz, E., & Phillips, N. (2018). Fish out of water: Translation, legitimation, and new venture creation. *Academy of Management Journal, 61*(5), 1627-1666.

Turner, S. F., Mitchell, W., & Bettis, R. A. (2010). Responding to rivals and complements: How market concentration shapes generational product innovation strategy. *Organization Science, 21*(4), 854-872. doi:10.1287/orsc.1090.0486

von Beschwitz, B. (2018). Cash windfalls and acquisitions. *Journal of Financial Economics, 128*(2), 287-319.

Waters, R. (2018, June 6). Google's diversity policies come under fire. *Financial Times*. Retrieved from https://www.ft.com/content/c4114ccc-69bd-11e8-8cf3-0c230fa67aec

Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal, 5*(2), 171-180.

Winston Smith, S. (2011). Beg, Borrow, and Deal? Entrepreneurs' Choice of Financing and New Firm Innovation. http://dx.doi.org/10.2139/ssrn.1787759

Wolf, M., & Terrell, D. (2016). The high-tech industry, what is it and why it matters to our economic future. *Beyond the Numbers: Employment & Unemployment, 5*(8). Washington, DC: Bureau of Labor Statistics.

Wright, M., Robbie, K., & Ennew, C. (1997). Serial entrepreneurs. *British Journal of Management, 8*(3), 251-268.

Zakrzewska-Bielawska, A. (2009). *High technology company – Concept, nature, characteristics.* In

N. Mastorakis, V. Mladenov, A. Zaharim, & C. A. Bulucea (Eds.). Recent Advances in Management, Marketing and Finances Proceedings of the 8th WSEAS International Conference on Management, Marketing and Finance (MMF '10) (pp. 93-98) USA: WSEAS Press.

Zulu-Chisanga, S., Boso, N., Adeola, O., & Oghazi, P. (2016). Investigating the path from firm innovativeness to financial performance: The roles of new product success, market responsiveness, and environment turbulence. *Journal of Small Business Strategy, 26*(1), 51-68.