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When to pray to the angels for funding: The seasonality of angel investing in new ventures

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ABSTRACT

Business angel (BA) investors – private individuals who make investments in new ventures – represent a significant economic impact contributing to the survival of new firms. BAs contribute billions of investment dollars to new ventures, positively influencing their growth, their ability to procure further financing, and their successful harvest. While recent research has examined BAs and their investment decision making, no research to date has examined the presence of a seasonal trend to their investment patterns even though research on other types of investments often follow seasonal trends. Utilizing a sample of 2558 independent early-stage angel investment deals over a nine-year period, we analyze the monthly total of investment deals, the average funding amount, and the monthly total volume of angel investment activity. Results suggest a seasonal trend in angel investment deals comprised of specific peaks and valleys in activity. Practical implications include a preparation time for entrepreneurs and new venture teams prior to seeking BA investment, optimal seasons for pitch competitions, and the importance of financial planning for new ventures. Theoretical implications include the potential for punctuated equilibrium in new venture teams. Finally, we contribute by identifying a novel phenomenon ripe for future research.

1. Introduction

Business angel (BA) investors are private individuals who make investments directly in unlisted companies in which they have no family connections (Mason and Harrison, 2000). Early and seed-stage investments made by BAs represent an important economic phenomenon as well as an essential resource for budding entrepreneurial firms hoping to scale their enterprise. Per the Center for Venture Research, the estimated size of the total angel investor market in the United States was \$24.6 billion in 2015, and this investment pool resulted in the creation of 270,200 new jobs (Sohl, 2015). BAs seek to invest in high-growth startup firms and their investments have considerable positive impacts on these firms. New ventures that attract BA financing exhibit higher survival rates, increased growth, more financing, more successful exits, and more employees compared to firms that cannot attract financing (Kerr, Lerner, and Schoar, 2010, 2014). BAs also fulfill a critical gap in funding that resides between initial startup funding (e.g., personal funds, friends and family) and traditional institutional funding (e.g., venture capital) (Lam, 2010; Riding et al., 1994, 2012). This important gap is sometimes referred to as the “valley of death” which accurately conveys the common outcome for firms which cannot attract funding during this essential phase (Frank, Sink, Mynatt, Rogers, and Rappazzo, 1996; Murphy and Edwards, 2003; Osawa and Miyazaki, 2006; Wessner, 2005). Finally, BAs contribute other resources to the ventures in which they invest, such as

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expertise, valuable social capital, and in some cases even emotional support (e.g. Ardichvili et al., 2002). Clearly, the role of BAs is important and in some cases essential to young ventures that require external financing.

However, the role of BAs was largely overlooked and poorly understood by most researchers and public policy makers until the phenomenon attracted explicit and consistent attention during the 1980s. Since that time, BA investment activity has received increasing research attention, most of which falls broadly within several general categories. First, the earliest research, focused on the sociodemographic characteristics of these investors and characteristics of the BA investor market (e.g., Hoffman, 1972; Wetzel, 1983), and this research continues today (e.g., Mitteness et al., 2012). A second body of BA research focuses more explicitly on BA's investment returns (Mason and Harrison, 2002; Wiltbank and Boeker, 2007; Wiltbank et al., 2009). Another area of research investigates the formation of BA investing groups and their operation (Carpentier and Suret, 2015; May, 2002; Sohl and Hill, 2007). A fourth stream of BA research focuses on how BAs operate as investors and managers (e.g., make investment decisions, manage portfolios, interact with entrepreneurs) (e.g., Maxwell et al., 2011). Finally, an area of research receiving increasing attention is the manner in which BA investment decisions are made, including stages of decision making in the deal making process (Mason and Harrison, 1996; 1996a; Maxwell et al., 2011; Jeffrey et al., 2016). We draw from this body of literature, inferences made by BAs, and comprehensive data to contribute to this existing understanding of BA investing.

To our knowledge, no previous research has explicitly investigated, and identified or verified, the existence of seasonal trends in BA investment deals. However, broader research focused more generally on many investment types provides evidence that many forms of investment exhibit seasonal trends (De Bondt and Thaler, 1987; Heston and Sadka, 2008; Keim, 1983; Loughran, 1997; Ng and Wang, 2004; Theobald and Price, 1984). There are identifiable seasonal trends across international markets (Corhay et al., 1987; Gultekin and Gultekin, 1983; Reinganum and Shapiro, 1987; Tinic et al., 1987), across investment sectors (Brauer and Chang, 1990; Colwell and Park, 1990; Hong and Yu, 2009; Lucey & Tully, 2006) and across time (Choi, 2015; Yao, 2012; Wachtel, 1942). Based upon the preceding literature and suggestions gathered directly from interactions and communication with BAs, we examine if seasonality characterizes BA investing. Put differently, we speculate that there may be *specific seasons for BA investing* which leads to the formation of our research questions: (1) is there a BA investor season (or seasons), and, (2) if so, when is it?

We seek to thoroughly investigate and establish the existence of the phenomenon thereby providing a robust foundation for future research which may focus more explicitly on the implications of this newly identified aspect of the BA investing behavior. Therefore, documenting and empirically validating this phenomenon is our fundamental purpose and primary contribution.

2. Relevant literature

As mentioned earlier, a body of research has elucidated the decision-making process by which BAs choose investment opportunities to pursue and structure deals with founders (and founding teams). Our examination in this paper focuses upon the deal between the BA(s) and the entrepreneur(s) as the unit of analysis. Within the body of literature focusing on the deal, research has indicated that the investment deal progresses through a multi-stage process, in which an opportunity is evaluated by the BA, examined during a due-diligence period, “consummated” between investor and founding parties, and then mutually enacted as the BA(s) become investment partners with the founder(s) (Landström and Mason, 2016; Maxwell, 2016). While these multi-stage models suggest a variety of different phases, all of these models suggest that BA investment deals are developed over a period of evaluation of different aspects of the business opportunity, from origination, to evaluation, to due diligence, to negotiation and consummation of the deal, to post-deal activity (Maxwell, 2016; Maxwell, Jeffrey, and Lévesque, 2011; Riding, Madill, & Haines Jr, 2007).

Research has found several contextual variables which can play a role in influencing the negotiation of the BA investment deal in the multi-stage process. The presence of various parties within the deal also play a role in BA investment decisions. Research indicates that BAs in formal investment groups make different investment decisions than individual BAs. For example, formal BA groups make larger investments, and structure different exits than individual BAs (Gregson, Mann, and Harrison, 2013; Mason and Harrison, 2015). Additionally, formal BA groups structure deals that are much more explicit, and complex than individual BAs (Carpentier and Suret, 2015; Kelly and Hay, 2003). Evidence indicates that formal BA groups are becoming more formalized, more centralized in regions, and more specialized (e.g., Tech Coast Angels and the Dinner Club) (Drover et al., in press).

Additionally, research has widely demonstrated different decision heuristics exist between more formal venture capital (VC) investors and less formal BA investors (Hsu, Haynie, Simmons, and Mckelvie, 2014; Kelly and Hay, 2003; Mason, Botelho, and Harrison, 2013; Van Osnabrugge, 2000), therefore the presence of VC investors within the deal can potentially impact deal structure and timing. For example, BAs place more emphasis on getting to know the investor in earlier stages of the deal process, and place more emphasis on economic factors of the opportunity later in the deal, compared to VC investors, who place more emphasis on economics in early stages (Hsu et al., 2014; Van Osnabrugge, 2000), and can take longer to conduct due diligence than BAs (Van Osnabrugge, 2000). Because economic factors, including business valuation and BA equity structure, are the primary reasons for deals ultimately failing, these factors are important considerations during the due diligence stage (Maxwell, 2016; Maxwell et al., 2011). Interestingly, Van Osnabrugge (2000) did not find a difference between the amount of equity stake contracted in the deal between VC investors and BAs. However, VCs can insist on different anti-dilution mechanisms and exit strategies compared to BAs (Mason et al., 2013; Peters, 2009).

In addition to the above mentioned contextual variables, the work of Jeffrey Sohl and others has shed light on the changing nature of BA investment through changing economic conditions (Mason and Harrison, 2015; Sohl, 2003a, 2011, 2012, 2003b, 2006). For example, evidence indicates that immediately following the economic recession period of 2008–2009, BAs began investing less in seed-stage funding and more in business growth funding (Mason and Harrison, 2015; Sohl, 2012). Such a change would merit an adjustment to the nature of the research performed throughout the multi-stage investment decision process by BAs.

The above literature demonstrates that several influences can impact the nature of the multi-stage process for the research and structuration of BA investment deals. These influences appropriately form the control variables examined in our study as we investigate whether BAs demonstrate any seasonality in their investments.

3. Methods

3.1. Sample

Our sample of BA deals was derived from the Privco database. Privco collects data on private companies. Companies and data are identified via the firms' verified financial activity and data is collected using a combination of technology-assisted data gathering combined with analyst research. Privco also relies on other trusted and validated sources of information (Security Exchange Commission filings, articles of incorporation, government contract awards, lawsuit documents, federal government agency documents, federal trade commission, direct contact with company and its investors for verification of key financial data, and hundreds of other sources). We sought and collected data on all available early and seed-stage deals (i.e., Series A and earlier) completed by BAs and/or BA groups between 2006 and 2014 for a total of nine complete years of data. This process yielded a total sample of 2558 independent early-stage deals completed by independent BAs or formal BA investment groups.

3.2. Variables

We aggregated all individual BA investment deals according to the month they were completed in order to assess the seasonality of the market. This resulted in 108 months of aggregated data. We were interested in three specific aspects of the deals required to evaluate the activity within the market: 1) total number of deals, 2) average funding amount, and 3) total volume of deals. Based upon our review of the literature presented above, a number of covariates were considered in the model. A full summary of these three dependent variables along with all of the covariates we have included based on our review can be found in Table 1. For each of the covariates, we have included specific citations we feel justify the inclusion of the variable in the model from a theoretical standpoint.

3.3. Analyses

We utilized multivariate analysis of covariance (MANCOVA) to assess whether or not there were significant differences in BA activity based on the specific month of the year. MANCOVA is an appropriate method as it evaluates means of multiple dependent variables across a categorical independent variable while controlling for other covariates. We analyzed the MANCOVA model in order to evaluate whether the total number of deals, average amount of deals, or total volume of all deals in a given month were statistically different depending on the month of the year. We then estimated the marginal means for each month and compared the main effects to determine which months were significantly greater than others to determine if there was any meaningful pattern in which BAs

Table 1
Definitions of variables.

Variable	Definition
<i>Dependent Variables</i>	
Total number of deals	Count of deals completed in a month
Average funding amount (thousands of dollars)	Average value of all deals in a month
Total volume of deals (millions of dollars)	Product of the number of deals and average funding amount for a given month
<i>Covariates</i>	
Location	Percentage of deals completed with companies in Boston, New York City, Northern California, or Southern California (dummy coded and aggregated for each city and month). (Drover et al., in press; Sohl 2003a, b; Maxwell, 2016)
Recession	Dichotomous variable indicating whether a deal was completed between December 2007 and June 2009 (1 = yes). (Sohl, 2010, 2012; Mason and Harrison, 2015)
Type of funding	Percentage of deals that were Series A funding rather than seed funding. (Hsu, Haynie, Simmons, and Mckelvie, 2014; Kelly and Hay, 2003; Van Osnabrugge, 2000)
Formal Angel Group	Percentage of deals that involved a formal angel group. (Gregson et al., 2013; Kelly and Hay, 2003; Mason and Harrison, 2015)
Number of investors	Average number of investors involved in deals for a given month (Gregson et al., 2013)
VC involvement	Percentage of deals that had a venture capital firm involved. (Hsu, Haynie, Simmons, and Mckelvie, 2014; Kelly and Hay, 2003; Van Osnabrugge, 2000)
Type of equity	Percentage of deals that were preferred equity rather than common equity (Maxwell, 2011, 2016; Van Osnabrugge, 2000)
Debt financing	Percentage of deals that involved any debt financing (Maxwell, 2011, 2016; Van Osnabrugge, 2000)
Liquidation preference	Percentage of deals that included investor liquidation options. (Maxwell, 2011, 2016; Van Osnabrugge, 2000)
Dilution protection	Percentage of deals that included investor dilution protection. (Maxwell, 2011, 2016; Van Osnabrugge, 2000)

Table 2
Means, standard deviations, and correlations.

		Mean	STDV	1	2	3	4	5
1	Total number of deals	23.470	16.127					
2	Average funding amount	3375.866	2134.361	−0.093				
3	Total volume of deals	76.056	66.479	0.797	0.321			
4	Boston	0.051	0.058	0.077	−0.098	0.044		
5	New York	0.143	0.106	0.132	0.404	0.156	0.103	
6	North California	0.383	0.151	0.132	−0.278	0.071	−0.058	−0.307
7	South California	0.057	0.069	0.011	−0.170	−0.063	−0.150	−0.110
8	Recession	0.176	0.383	−0.338	0.140	−0.205	−0.080	−0.136
9	Type of funding	0.558	0.206	−0.605	0.278	−0.327	−0.251	−0.196
10	Formal Angel Group	0.280	0.126	−0.244	−0.016	−0.189	−0.101	−0.136
11	Number of investors	4.040	1.158	0.750	−0.139	0.614	0.149	0.245
12	VC involvement	0.675	0.169	0.358	0.006	0.339	0.089	0.110
13	Type of equity	0.232	0.151	0.442	0.093	0.540	−0.020	−0.038
14	Debt financing	0.015	0.035	−0.071	−0.016	−0.038	0.093	−0.098
15	Liquidation preference	0.229	0.153	0.460	0.111	0.566	0.005	−0.020
16	Dilution protection	0.232	0.151	0.452	0.106	0.561	−0.006	−0.034

		6	7	8	9	10	11	12	13	14	15
6	North California										
7	South California	−0.236									
8	Recession	−0.029	−0.075								
9	Type of funding	−0.146	−0.159	0.295							
10	Formal Angel Group	−0.275	0.358	−0.008	0.167						
11	Number of investors	0.249	−0.056	−0.402	−0.599	−0.297					
12	VC involvement	0.282	−0.327	−0.121	−0.043	−0.202	0.560				
13	Type of equity	0.028	−0.165	−0.161	0.058	−0.142	0.313	0.316			
14	Debt financing	0.247	−0.065	−0.155	0.015	0.092	−0.048	0.022	−0.064		
15	Liquidation preference	−0.024	−0.145	−0.188	0.043	−0.134	0.318	0.286	0.983	−0.035	
16	Dilution protection	0.010	−0.149	−0.173	0.048	−0.152	0.313	0.302	0.991	−0.031	0.993

Correlation larger than $+/-0.247$ is significant at the 0.01 level (2-tailed).

Correlation larger than $+/-0.196$ is significant at the 0.05 level (2-tailed).

operated. Prior to all analysis, we evaluated our data for appropriateness of MANCOVA based on the assumptions presented by Stevens (2012).

4. Results

We evaluated the correlations and VIFs for each of the DVs and covariates respectively prior to conducting the main MANCOVA analysis. Means, standard deviations, and correlations are reported in Table 2. The type of equity (preferred versus common) variable was highly correlated with both liquidation preference and dilution protection and all three variables exhibited VIFs greater than 10 when entered into models together. We found that deals that provided investors with preferred equity also provided them with liquidation preference and dilution protection in almost every deal. Therefore, we dropped the liquidation preference and dilution

Table 3
MANCOVA Multivariate Tests Results.

	Roy's Largest Root	F-Test
Boston	0.110	3.030*
New York	0.389	10.773**
North California	0.041	1.148
South California	0.013	0.362
Recession	0.033	0.909
Type of funding	0.365	10.095**
Formal Angel Group	0.014	0.378
Number of investors	0.213	5.893**
VC involvement	0.030	0.823
Type of equity	0.503	13.927**
Debt financing	0.028	0.775
Month	0.329	2.540**

* significant at the 0.05 level

** significant at the 0.01 level

Table 4
MANCOVA Pairwise Comparison of Main Effects Results.

Dependent Variable	Month	Average ^a		Month	Average ^a	
Number of Deals	February	20.86	<	January	28.98	
	November	19.84				
	December	20.00				
Average Value of Deal (Thousands of \$'s)	February	\$2,007.90	<	April	\$4533.53	
	March	\$2,788.70				
	July	\$2,543.06		May	\$4709.17	
	November	\$2,161.45				
	December	\$3,141.74		<	August	\$3,875.80
	February	\$2,007.90				
	November	\$2,161.45				
	January	\$3,226.58				
	February	\$2,007.90				
	March	\$2,788.70				
June	\$3,228.24	October	\$4,914.67			
July	\$2,543.06					
September	\$3,379.56	<	January	\$93.42		
November	\$2,161.45					
December	\$3,141.74					
Total Volume of Deals (Millions of \$'s)	February	\$40.31	<	June	\$85.04	
	November	\$42.38		September	\$92.14	
	February	\$40.31		<	April	\$96.94
November	\$42.38	May	\$94.31			
December	\$58.01	October	\$100.30			

^aEstimated marginal means based on covariates

protection variables from the MANCOVA analysis.

The results of the MANCOVA multivariate tests analysis are displayed in Table 3. Based on the results in Table 3, we do find that the month a deal is completed is significantly related to the different values of at least one of the three DVs in the model. We then evaluated the results of the comparison of main effects of the month a deal is completed to determine the exact effects a month has on the three DVs of the model. These results are presented in Table 4. Each of the dependent variables is categorized on the left of Table 4, while the months that are significantly greater according to the pairwise comparisons of the MANCOVA analysis are displayed on the right side of the table. The months displayed in the middle of the table are the months that were shown to be significantly less than the months displayed on the right of the table. Thus, we do find significant evidence of annual seasonality in BA investment activity in terms of the number of deals, average value of deals, and volume of deals as depicted below in Table 4 and Figs. 1, 2, and 3.

5. Discussion

To our knowledge, while a growing body of literature has explored multi-stage models of BA investing decision patterns, no research has examined the seasonality of those processes. Our findings suggest that BA investing experiences a distinctly seasonal trend (see Figures 1–3). Specifically, the average number of deals is significantly greater in the month of January. The average dollar amount of deals is significantly greater during the spring months of April and May, and late summer/fall months of August and October. Overall, the total volume of deals is significantly higher in 3 seasons: January, in the spring months of April and May, and in the fall months of September and October. These results present interesting implications for practice and theory.

In contributing to theory, these results shed light on the body of research suggesting that BA investment occurs in a multi-stage process. Deals in our data signal the “consummation” (Maxwell, 2016) of the negotiation stage at which the entrepreneur or founding team and BA investor come to agreement about the valuation of the business, the economics of the business plan, the role of the BA,

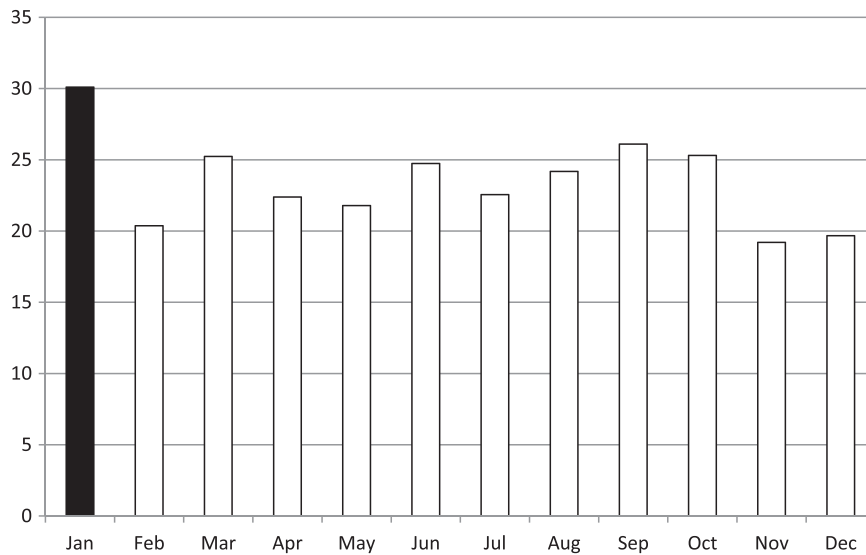


Fig. 1. Estimated marginal means of the number of deals.

and other contract stipulations. There are several interesting patterns in our data that suggest exciting opportunities for future research.

Consistent with research which indicates that BAs strongly consider the robustness of the economics of the business model, including the validity of revenue forecasting models and the valuation calculation of the opportunity (Hsu et al., 2014; Van Osnabrugge, 2000), two results suggest the possibility of seasonal influences upon the BAs decision process. First, we observe that there are likely institutional influences on BA investing. For example, the significantly increased numbers of deals in January could reflect the availability of year-end financial statements that provide evidentiary data of economic feasibility and the potential validity of forecasts for opportunities under consideration. Similarly, January represents a new year, psychologically and fiscally, in which BAs potentially have both the motivation and war chest of money to be invested replenished after the holidays and fiscal year have both ended. As BAs tend to be quite wealthy individuals, by January they may have had year-end meetings with their own financial advisors, updating them about their relative financial condition for further investment activity. Future research could examine the activities of BAs through year-end months, leading up to and including January, to discover the various antecedent influences to their decision to consummate a greater number of deals. Similarly, the US, tax ‘season’ culminates in mid-April, at the beginning of the ‘spring season’ of BA investment activity with regard to the average size of deals. Future research should investigate the seasonality, even if for institutional reasons, of financial information, and its influence upon the investment activity of BAs.

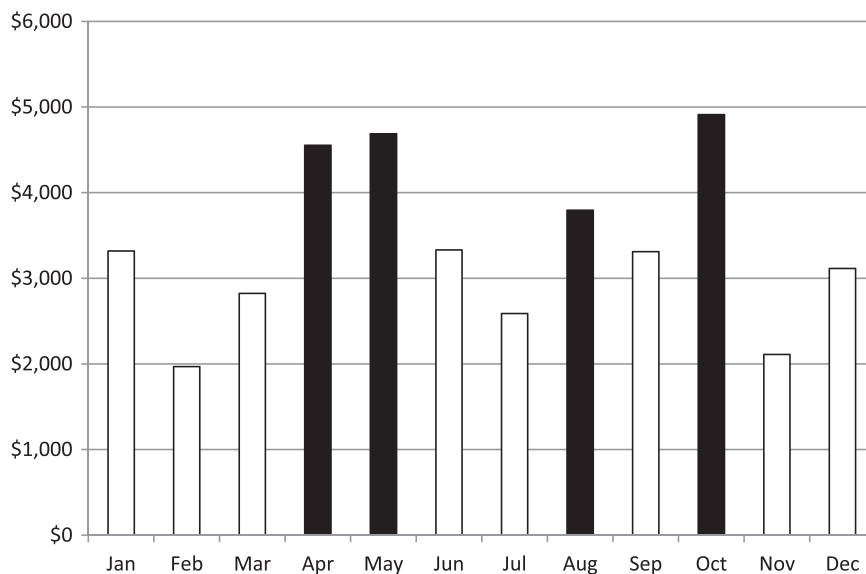


Fig. 2. Estimated marginal means of the value of deals (in thousands).

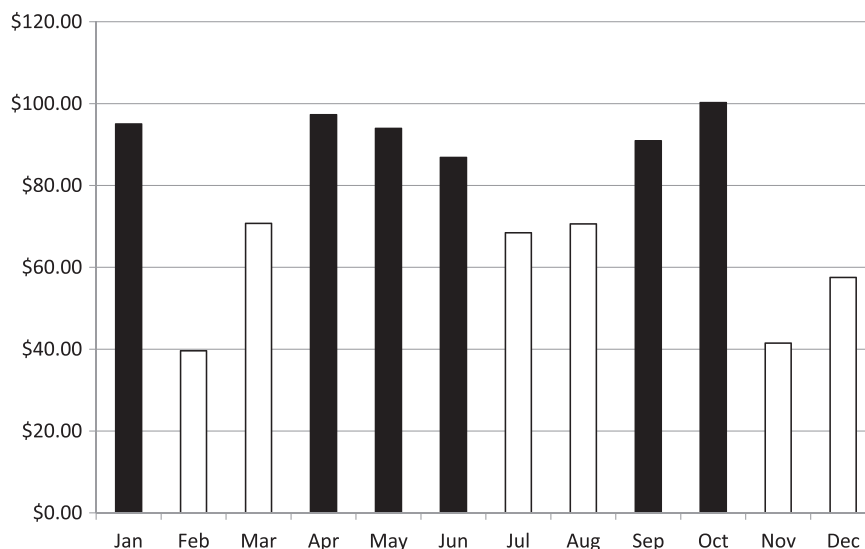


Fig. 3. Estimated marginal means of the total volume of deals (in millions).

Alternatively, another influence may be responsible for both of these seasons of BA investment activity. Many business idea pitch competitions and large multi-day festivals highlighting innovation and opportunities for investment, occur in (or around) March and November. The months of March and early April hosts cultural events like South by Southwest in Austin, Texas, and One Spark, an annual innovators' showcase. Both events attract audiences of hundreds of thousands of attendees each year. November is the month of Global Entrepreneurship Week, in which entrepreneurial activity is highlighted through innovation fairs and business idea pitch competitions at colleges, universities, creative foundries, and other institution supporting entrepreneurial activity. The seasonality of these events showcasing entrepreneurial activity allows for a period of due diligence to follow in which multi-stage models of BA decision making activity occur, leading to the eventual culmination in BA funding deals. It is reasonable to consider that January represents an influx of financial information combined with a seasonally renewed cognitive perspective and motivation on the part of the BA, leading to a significantly greater number of deals, while a greater number of cultural events showcasing innovation in early spring, combined with a greater awareness of the BAs financial condition explains the greater size of funding events in later spring months. Likewise, entrepreneurial activity including pitch competitions associated with Global Entrepreneurship Month in November allow for a two-month period of BA investment decision making and due diligence, explaining a greater number of deals in January.

We speculate that October signifies the time of the year when BAs attempt to finish all investment deals for the year thereby closing up their annual investment portfolio for the year prior to the natural breaks in activity around the holiday season in November and December. Since most BAs operate as individual investors and not as corporations, like VCs, the desire to avoid this type of work over the holidays makes sense intuitively and BAs appear motivated to complete as much work as possible in October.

Additionally, several covariates were significant in our analysis. Region plays a role along with seasonality. Our data suggests that the northeastern region of the United States contributes along with seasonality in BA investment decisions (14.3% of our sample consisted of deals closed for companies in the New York City area, while 5.1% of the sample represented deals closed with companies located in the Boston area). Neither region in California where another large segment of deals closed was a significant covariant. Future research should investigate influences that distinguish these two regions of investing activity and how they might specifically contribute along with seasonality to BA investment decisions.

The type of funding also plays a role along with seasonality. In our data, a greater percentage of Series A funding and a greater percentage of preferred equity were both significant covariates with differences in the three DVs of activity across different months. This feature in the data is consistent with the body of research which suggests that these deals are more complex, and requires a different intensity of due diligence in the multi-stage decision process. Consistent with this line of thought is the finding that the number of investors, which increases the complexity of the deal, also plays a role along with seasonality. Future research should investigate if, and how, the complexity of the multi-stage process may be related to seasonality, and what external influences affect the decision process in a seasonal manner. Understanding this may have potential implications for practice and policy.

From the perspective of practice, our results suggest that BAs are significantly more likely to make investments, and to make larger investments, in the months of January, a spring season of April and May, and a fall season of August, September, and October. This has implications for entrepreneurs who plan to utilize BA investment to grow their ventures. In the months leading up to these, entrepreneurs should be developing the strategic strength of their business plans, verifying and validating their economic forecasting models, calculating valuation, solidifying their pitch decks, practicing their elevator pitches, and beginning to locate and network with BA investment groups.

Additionally, theoretical models of group behavior, such as punctuated equilibrium (Gersick, 1988) may apply to investment patterns of BA groups. At the same time, understanding the seasonality of BA investment patterns could inform researchers investigating the group behaviors of founding teams. An interesting theoretical integration could use the findings of Okhuysen and

Waller (2002) in exploring the conditions in which such punctuation points could occur, and what outcomes emerge as a result. It could be that founding teams engaging in better quality planning and preparation for BA investment seasons may acquire greater investment capital than founding teams that fail to maintain their preparation activities. Further research should examine the factors contributing to this seasonality, potential antecedents, and processes that follow these investment seasons.

6. Conclusion

Angel investment is a necessary and impactful vehicle for capital flows and firm survival for many new ventures. Our results suggest that BA investment deals occur seasonally. Our findings provide preliminary evidence for the value of further research in the entrepreneurship and finance literatures into this new domain of inquiry involving early stage investments by BAs. These findings also point to potential practical implications for new venture founders and founding teams in both preparing for BA investment seasons, but also in planning for capital flow in their firms.

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