

BUSINESS FORUM

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Business Forum is dedicated to improving the effectiveness of business in contemporary society. We provide a forum for fresh ideas, impactful research, and possible solutions to business challenges. We strive to close the gap between research and practice and enable evidence-based business management.

Our peer-reviewed articles address specialized and interdisciplinary issues of interest to business practitioners. We accept manuscripts from all domains of business, usually themed by a particular journal issue. We also publish reviews of books and digital materials of interest to our audiences as well as important insights shared by business and civic leaders.

Business Forum is published semiannually as an educational service of the College of Business and Economics at California State University, Los Angeles. As such, papers addressing economic development in our region, or useful to its business managers or for the public good are especially welcome.

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EDITORIAL



Welcome to the current issue of the *Business Forum*. This issue features articles on “startups.” The *Business Forum* is a scholar-practitioner, peer-reviewed journal published by the College of Business and Economics at Cal State LA. The *Business Forum* has provided scholarly advice with application to business practices since 1975 and it is now revitalized in a modern print-online format. This is not a traditional academic journal. Our articles aim to advance business practice through application of research and theoretical synthesis of information relevant to business.

Our special issue on “Startups” features papers that look at startups from an academic and practitioner perspective. Startups operate in the entrepreneurial landscape and are interdisciplinary by nature. As such, we welcomed and encouraged articles from various disciplines with a focus on specific concerns related to startups and their managers.

Research has shown that the formation, attributes, and success of entrepreneurship are region-specific. Thus, we begin this issue with an article that examines the characteristics of startups in Los Angeles. In particular, the authors look at startups’ general business area, operating status, funding history, and key corporate actions. Also reviewed are characteristics within the national and state context. Recommendations to entrepreneurs and investors are made based on the findings.

In a 2017 Kauffman Index of Startup Activity report, California is ranked as the number one state for startup activity and Los Angeles is ranked as one of the high-performing metropolitan cities in the entrepreneurship ecosystem. However, in 2018, Los Angeles has experienced a drop by three spots in its ranking on Startup Genome’s global startup ecosystem list. In this paper, light is shed on the main characteristics of nascent entrepreneurs in the Los Angeles area and, more importantly, the individual and environmental factors that help or inhibit the growth of their startups. The article concludes with practical implications and recommendations for Los Angeles city government agencies and legislators.

Small and medium-sized enterprises (SMEs) in the United States and Europe have in recent decades developed and gone from being minor players in local markets to essential actors in the global market. The introduction of online-based global standards for communication and analytics has made it possible for SMEs to function in the international market. In this way, SMEs can promote themselves as full-fledged international companies and as niche suppliers, as they develop and execute company-wide trade strategies for use on the global market.

The unique issues faced by startups in the cannabis industry are examined in the next article. The elements that influence cannabis startups are examined by using the PESTLE framework which includes political, economic, social, technological, legal and ecological factors. Three types of

cannabis startups are identified. The article provides a brief analysis of differences between them as well as the challenges that they all face.

The next paper focuses on agile development in the software industry. Agile development methods have become very popular, specifically with software startups. Extant literature does not emphasize the decision-making processes of agile developers, particularly in startups. The goal of this research was to propose a framework where startup developers make these decisions and how those processes align with customer needs.

What business entity the owners of a startup business choose will determine the tax and non-tax consequences for both the owners and the startup. However, by understanding the similarities and differences of business entities, owners can choose the best business structure for their startup business. As an aid in the process of choosing a business entity for a startup, this paper provides an overview of the rules, requirements, advantages, and disadvantages of several business entities.

The final paper examines the accounting and financial aspects of startup companies. Because startup companies have shorter histories of past performance, both managers and investors face more uncertainty regarding future profitability and growth potential. For this study, data from U.S. firms for 1991-2015 was collected to determine whether firms in their early stages report different financial characteristics than those reported by mature firms.

We conclude this issue with a book review of *The Model Thinker* by **Scott Page**, Ph.D. The book provides a detailed treatise on the background, use of, and building of a wide variety of mathematical, statistical, and computational models. The models covered include game theory, random walks, linear regression, and many more. The models in the book are explained for the most part in non-mathematical terms. This should make model building accessible to a much wider audience than what has been the case before.

Paul M. Wendee

Issue Editor

STARTUPS IN LOS ANGELES

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SUMMARY: Research has shown that the formation, attributes, and success of entrepreneurship are region-specific. Thus, this study examines the characteristics of startups in Los Angeles. In particular, we look at startups' general business area, operating status, funding history, and key corporate actions. We also review these characteristics within the national and state context. Recommendations to entrepreneurs and investors are made based on our findings.

Introduction

The importance of entrepreneurship has been studied extensively. For instance, Holtz-Eakin and Kao (2003) find a positive impact of entrepreneurship on labor productivity growth in the US. Using data from 145 European regions, Boente et al. (2008) also find a positive relationship between total factor productivity and entrepreneurship capital. Kane (2010) argues that job creation in the US comes mainly from startups. Bunten et al. (2015) also show a positive effect of entrepreneurship on future employment growth at the county level in the US. Audretsch and Keilbach (2004) conclude that income per capita in Germany is directly related to various measures of entrepreneurship capital. Hence, as detailed in Kressel and Lanto (2012), startups are important for technological innovation, job creation, and economic growth.

Given its economic significance, researchers have been trying to identify the driving forces behind entrepreneurship. According to Saboe and Condliffe (2015), individuals are more likely to start new businesses in regions with a high presence of new and small firms and with institutions that promote entrepreneurial cultures. While spousal support from marriage makes financing startups more affordable, higher education suggests higher income and thus higher opportunity cost of starting new businesses. Using case studies in three Canadian cities, Spigel (2015) argues that interactions between cultural, social, and material elements in a region are important to entrepreneurial ecosystems. They impact entrepreneurs' motivation towards fast growth and acquisition or towards innovation and long-term investment in research and development.

Hence, there seems to be a strong regional effect on entrepreneurship and startup ecosystems. Indeed, a growing literature has been focusing on the causes and effects of geographic clustering of startups. For example, Delgado et al. (2010) find that new firm creation tends to accelerate in industries with access to or located within strong regional clusters. The presence of clusters is also conducive to the survival of startup firms. Glaeser and Kerr (2010) conclude that employment grows faster in areas with more small and independent firms. Thus, local governments should implement the quality of life policies that attract smart and entrepreneurial people instead of investing heavily in attracting large and mature firms. Florida and Mellander (2014) show that venture capital investments are moving away from suburbs and clustering again in urban centers with high levels of human capital.

All of these studies are interesting from academic and policymaking standpoints. They help us understand broadly how to foster and spread innovation. However, they fail to offer more region-specific information, especially given the importance of geographic clustering and regional cultural and social differences. Information more useful to entrepreneurs who are looking to start a business or investors who want to finance startups can include the following: the type of startups most popular in a particular region, their prospects for future acquisition and initial public offering (IPO), and the expectations on funding amount and structures.

Among the studies listed earlier, Florida and Mellander (2014) does provide statistics on venture capital investment at the state and city levels. Specifically, it finds that Southern California accounts for more than 11% of total venture capital investment in the US. As an urban center, Los Angeles is ranked 5th in the nation in terms of total venture capital investment and 16th in terms of per capita venture capital investment. Unfortunately, their paper does not go beyond venture capital investment and neither does it take a closer look at the industry level.

Against the above background, this study intends to fill the literature gap by looking into the characteristics of startups in Los Angeles. These characteristics include business areas, funding amount and rounds, key corporate actions such as IPO, acquisition, and shutdown. We examine them at both the city and the industry level, as well as compare and contrast them within the context of the US and California.

The above-listed characteristics reflect region-specific information about startups' industry types, funding sources, and survival statistics, all of which have been shown to correlate with the potential success of new entrants. As mentioned earlier, Delgado et al. (2010) find higher growth of new business formation and startup employment in industries with strong regional clusters. In other words, startups in a business area that is popular in the region are more likely to succeed. Pajunen and Jarvinen (2018) find that at least in biotechnology, public equity financing lowers a startup's failure rate while private equity financing increases the failure rate. Using a Danish data of wireless communication firms, Dahl et al. (2003) conclude that the performance of early entrants in the industry is positively associated with the success of the following entrants.

The rest of the paper proceeds as follows. We first describe our data source and then report the empirical results. Based on the results, we conclude with recommendations to entrepreneurs and investors who are interested in startups in Los Angeles.

Data

Crunchbase is a company that provides data on startups, including information of the organization, key people, product profile, funding amount and rounds, and events such as acquisition and IPO. Historical data collected by Crunchbase before December 2013 are freely available to applicants who have completed a simple online registration form. The present study takes advantage of this 2013 database, known as the Crunchbase 2013 Snapshot. All the analyses are based on the 2013 Snapshot.

This database consists of startups from 177 countries across the globe. Among all the countries, the US has the highest number of companies (51,637), followed by Great Britain (7,372), India (3,924), and Canada (3,728). There are 42 different categories for the type of business the startups are in. Some of the most popular industries are software (15%), web (12%), ecommerce (7%), games and video (6%), mobile (6%), advertising (5%), consulting (4%), enterprise (4%), and biotech (4%). This study only focuses on the companies located in the US. It is particularly interested in startups that list Los Angeles, California as their location region.

Results

An Overview of the US and California

Table 1 shows 12 states with the highest number of startups in the US. California is the leading state, boasting 32.46% of total startups in the country. It is followed by New York (11.28%), Massachusetts (5.7%), Texas (5.53%), and Florida (4.24%). For the remaining states not listed in the table, each of them has less than 2% share of total startups.

Table 1

Top States for Startups in the US, 2013

| State | Across State | | Within State | | | |
|-------|---------------|------------|--------------|----------|-------|--------|
| | # of startups | % of total | Operating | Acquired | IPO | Closed |
| CA | 16,447 | 32.46% | 83.59% | 11.24% | 1.66% | 3.51% |
| NY | 5,716 | 11.28% | 88.87% | 7.52% | 1.17% | 2.43% |
| MA | 2,933 | 5.79% | 80.94% | 13.06% | 3.51% | 2.49% |
| TX | 2,802 | 5.53% | 86.58% | 9.35% | 1.71% | 2.36% |
| FL | 2,149 | 4.24% | 91.02% | 5.91% | 1.44% | 1.63% |
| WA | 1,887 | 3.72% | 85.32% | 10.39% | 1.75% | 2.54% |
| IL | 1,736 | 3.43% | 87.33% | 8.76% | 1.73% | 2.19% |
| PA | 1,320 | 2.61% | 86.14% | 9.02% | 1.97% | 2.88% |
| NJ | 1,179 | 2.33% | 84.90% | 10.69% | 2.88% | 1.53% |
| CO | 1,172 | 2.31% | 84.64% | 10.67% | 1.96% | 2.73% |
| VA | 1,156 | 2.28% | 84.95% | 11.33% | 1.82% | 1.90% |
| GA | 1,119 | 2.21% | 88.03% | 8.40% | 1.70% | 1.88% |

In contrast, California (3.51%) has the highest percentage of businesses that are closed, compared to New Jersey (1.53%), the state with the lowest percentage. Meanwhile, Massachusetts has the highest percentage of firms that get acquired (13.06%), followed by Virginia (11.33%) and California (11.24%). Massachusetts (3.51%) and New Jersey (2.88%) lead in startup IPOs by a large margin.

Table 2 gives more regional details on California. Los Angeles is second to San Francisco in terms of the number of startups in California. Los Angeles also has the lowest percentage of firms that are closed (2.78%), compared to the highest in Santa Barbara (3.98%). More startups get acquired in San Francisco (13.63%), while more firms go public in San Diego (3.27%).

Table 2
Top Regions for Startups in California, 2013

| <u>Region</u> | <u>Across Region</u> | | <u>Within Region</u> | | | |
|---------------|----------------------|-------------------|----------------------|-----------------|------------|---------------|
| | <u># of startups</u> | <u>% of total</u> | <u>Operating</u> | <u>Acquired</u> | <u>IPO</u> | <u>Closed</u> |
| San Francisco | 9,942 | 60.48% | 80.88% | 13.63% | 1.62% | 3.87% |
| Los Angeles | 4,032 | 24.53% | 88.17% | 7.61% | 1.44% | 2.78% |
| San Diego | 1,191 | 7.24% | 84.72% | 9.15% | 3.27% | 2.85% |
| Sacramento | 211 | 1.28% | 88.15% | 7.58% | 0.95% | 3.32% |
| Santa Barbara | 176 | 1.07% | 89.77% | 3.98% | 2.27% | 3.98% |

A Closer Look at Los Angeles

According to Tables 1 and 2, startups in Los Angeles are more likely to be operating compared to the national and California averages. Specifically, while about 88% of startups in Los Angeles stay operating, about 84% of startups in California and 86% in the US stay operating. However, a smaller percentage of startups in Los Angeles get acquired (7.6%) or go public (1.4%), compared to the national (9.6% acquired, 1.8% IPO) and California (11.2% acquired, 1.7% IPO) averages.

As shown in Table 3, the top industries for startups in Los Angeles are web, software, games and video, advertising, ecommerce, mobile, consulting, biotech, hardware, and enterprise. For the remaining categories, each of them has less than 2% share of startups in Los Angeles. The only exception is “other” category, which has about 8% of startups in the region. Companies in business areas such as ecommerce (95%), consulting (94%), and advertising (92%) are more likely to stay operating. Those in hardware (13%), web (11%), software (10%), and enterprise (10%) are more popular with acquisition. Startups in biotech (10%) outperform everyone else in terms of IPO, followed by hardware (4%) and consulting (3%) as a distant second and third.

Table 4 shows the top industries for startup funding in Los Angeles by the amount of funding. The majority of the startups (about 81%) have funding less than or equal to \$1 million US dollars. Among the startups that receive more than \$1 million US dollars in funding, those in biotech, cleantech, games and video, semiconductor, software, and web are more attractive to investors than others.

Table 5 shows the top industries for startup funding in Los Angeles by the number of funding rounds. Among the startups that receive funding, about 62% of them only receive one round of funding and about 22% receive two rounds of funding. For firms who receive three and more rounds of funding, those in biotech and enterprise are able to attract the highest number of funding rounds. Startups in advertising, semiconductor, software, and web are also popular among investors for multiple rounds of funding.

Table 3
Top Industries for Startups in Los Angeles, 2013

| <u>Industry</u> | <u>Across Industry</u> | | <u>Within Industry</u> | | | |
|-----------------|------------------------|-------------------|------------------------|-----------------|------------|---------------|
| | <u># of startups</u> | <u>% of total</u> | <u>Operating</u> | <u>Acquired</u> | <u>IPO</u> | <u>Closed</u> |
| Web | 472 | 11.71% | 81.57% | 11.44% | 0.85% | 6.14% |
| Software | 420 | 10.42% | 85.95% | 9.76% | 0.95% | 3.33% |
| Games & video | 340 | 8.43% | 84.12% | 8.53% | 1.47% | 5.88% |
| Advertising | 263 | 6.52% | 91.63% | 6.46% | 0.76% | 1.14% |
| Ecommerce | 255 | 6.32% | 94.51% | 2.75% | 0.00% | 2.75% |
| Mobile | 185 | 4.59% | 88.11% | 6.49% | 2.16% | 3.24% |
| Consulting | 133 | 3.30% | 93.98% | 2.26% | 3.01% | 0.75% |
| Biotech | 122 | 3.03% | 79.51% | 9.02% | 9.84% | 1.64% |
| Hardware | 104 | 2.58% | 78.85% | 13.46% | 3.85% | 3.85% |
| Enterprise | 103 | 2.55% | 88.35% | 9.71% | 1.94% | 0.00% |

Table 4
Top Industries for Startup Funding in Los Angeles by Amount, 2013

| <u>\$1m – \$5m</u> | <u>\$5m – \$10m</u> | <u>\$10m – \$50m</u> | <u>\$50m – \$100m</u> | <u>Above \$100m</u> |
|----------------------------|---|--------------------------------------|---|----------------------|
| Biotech Software Web | Biotech Games & video Software Web | Biotech Games & video Software | Biotech Games & video Semiconductor | Biotech Cleantech |

Table 5
Top Industries for Startup Funding in Los Angeles by Number of Rounds, 2013

| <u>3–5 Rounds</u> | <u>5–10 Rounds</u> | <u>More Than 10 Rounds</u> |
|--------------------------------|---|----------------------------|
| Advertising Software Web | Advertising Biotech Semiconductor | Biotech Enterprise |

Conclusion

This paper examines the characteristics of startups in Los Angeles, California. Its main findings can be summarized as follows.

1. Los Angeles is the second most popular region for startups in California, which is the most popular state for startups in the US.
2. Startups in Los Angeles are more likely to stay operating but less likely to get acquired or go public.
3. In Los Angeles, firms in advertising, consulting, and ecommerce are more likely to stay operating. Meanwhile, those in enterprise, hardware, software, and web are more likely to get acquired. Biotech, consulting, and hardware are the leading industries for IPO.
4. The majority of the startups in Los Angeles receive less than or equal to \$1 million US dollars in funding, and the number of funding rounds is usually smaller than three.
5. Among startups who receive funding, those in biotech, cleantech, games and video, semiconductor, software, and web attract more funds. At the same time, companies in advertising, biotech, enterprise, semiconductor, software, and web take the lead in the number of funding rounds.

Based on the results above, we make the following recommendations to entrepreneurs and investors. For entrepreneurs looking to start a business in Los Angeles, advertising, biotech, consulting, ecommerce, enterprise, hardware, software, and web are good industries to consider. Typically, one should expect to receive less than \$1 million US dollars in funding and fewer than three rounds of funding, with the exception of industries such as advertising, biotech, cleantech, enterprise, games and video, semiconductor, software, and web.

For investors interested in startups in Los Angeles, companies in advertising, consulting, and ecommerce are good for long-term investment. Meanwhile, those in enterprise, hardware, software, and web are better acquisition candidates. The prospect of IPO is highest in biotech firms, followed by those in hardware and consulting. Typically, the total amount of funds needed is less than \$1 million US dollars within 1–2 rounds. The outliers are startups in advertising, biotech, cleantech, enterprise, games and video, semiconductor, software, and web.

In general, advertising, biotech, and IT-related industries are better for entrepreneurship in Los Angeles. The success of advertising and IT startups might be attributed to economies of agglomeration (Romer, 1986). For example, one can easily find actors, actresses, and film production services to make a commercial thanks to Hollywood. Also, the city is becoming the next tech hub as tech elites start leaving Silicon Valley and moving to Los Angeles (Peltz and Pierson, 2018). This makes finding workers, partners, and investors for IT-related enterprises easier and cheaper. For biotech, firm alliances with universities and research institutes have been found conducive to the success of startups (Pajunen and Jarvinen, 2018). Los Angeles is not only a big city with diverse talents but is home to many well-known universities and research institutes such as USC, UCLA, and RAND Corporation.

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A QUALITATIVE ANALYSIS of NASCENT ENTREPRENEURS and STARTUP GROWTH FACTORS in LOS ANGELES

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SUMMARY: In a 2017 Kauffman Index of Startup Activity report, California is ranked as the number one state for startup activity and Los Angeles is ranked as one of the high-performing metropolitan cities in the entrepreneurship ecosystem. However, in 2018, Los Angeles experienced a drop by three spots in its ranking on Startup Genome's global startup ecosystem list. In our research study, we shed light on the main characteristics of nascent entrepreneurs in the Los Angeles area and, more importantly, the individual and environmental factors that help or inhibit the growth of their startups. We conclude the article with practical implications and recommendations for Los Angeles city government agencies and legislators.

Keywords: nascent entrepreneurs, startup growth, startup ecosystem.

Introduction

The percentage of new job seekers starting their own businesses is on the rise (Darrow, 2017). According to the 2017 Kauffman Index of Startup Activity: State Trends report, California is ranked as being the #1 state for startup activity (Ewing Marion Kauffman Foundation [EMKF], 2017a). The report measures startup activity based on three dimensions: the rate of new entrepreneurs, the percentage of entrepreneurs driven primarily by opportunity (as opposed to necessity) and the rate at which businesses with employees are created in the economy (startup density) (EMKF, 2017a). Los Angeles is noted as being one of the high-performing metro areas (EMKF, 2017a). The 2017 Kauffman Index of Startup Activity: Metropolitan Area and City Trends report lists Los Angeles as being #3 for startup activity, trailing Miami and Austin (EMKF, 2017b). The report states that in a given month, Los Angeles has 560 new entrepreneurs for every 100,000 adults.

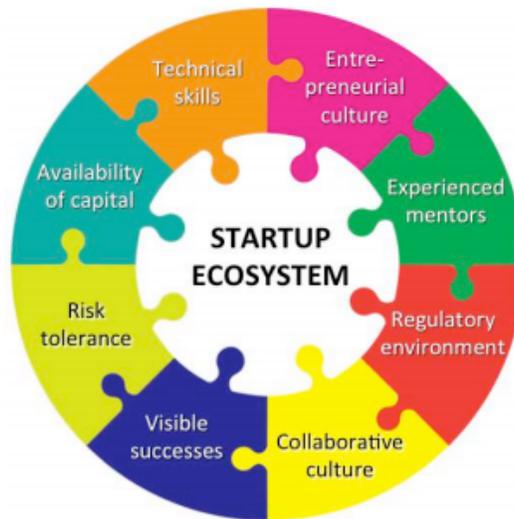
While these statistics highlight the budding startup economy in Los Angeles, it is critical to gain an understanding of the individuals behind the surge in startup growth. Shane and Venkataraman (2000) present a conceptual framework that states that the decision to exploit entrepreneurial opportunities depends on the characteristics of the opportunity and individual differences. In this qualitative study, we examine how individual and environmental factors drive or inhibit the startup growth process of nascent entrepreneurs in Los Angeles. Delmar & Davidsson (2000) describe a nascent entrepreneur as an individual who is trying to start an independent business. Some individual characteristics that can drive or inhibit nascent entrepreneurs include

the presence of role models, impressions of self-employment, age, education and founder mindset (Delmar & Davidsson, 2000; Stangler, 2018).

In addition to individual differences, environmental factors also affect nascent entrepreneurs (Shirokova, Osiyevskyy & Bogatyreva, 2016; Stangler, 2018). One such environmental factor is the startup ecosystem of business locations. Oracle proposes (see Figure 1) that the elements of a vibrant startup ecosystem are entrepreneurial culture, experienced mentors, regulatory environment, collaborative culture, visible successes, risk tolerance, availability of capital and technical skills (Oracle, 2018).

Figure 1

Elements of a vibrant startup ecosystem



It appears that Los Angeles has a vibrant startup ecosystem because it is experiencing an uptick in startup activity (EMKF, 2017b). However, the U.S. Small Business Administration Office of Advocacy cautions that one in 12 U.S. businesses close every year (Headd, 2018) and an investigation of startup growth factors in Los Angeles is timely as Maack (2018) indicates that the city has dropped (three spots) in its ranking on Startup Genome's global startup ecosystem list. Our study provides a qualitative analysis of startup drivers and inhibitors that nascent entrepreneurs are experiencing in the Los Angeles area.

Where are the New Startups?

Witnessing the rise of nascent entrepreneurs aged as young as eleven years old, Marinova (2016) discusses the importance of investigating new startups' founders and locations. While possible and yet rare at that early age, more successful entrepreneurs emerge during college years where young entrepreneurs are more exposed to useful tools and opportunities to develop entrepreneurial skills and knowledge (Hand, 2018). In this qualitative study, we focus on the nascent entrepreneurs among the students at a large public university in Los Angeles. We interviewed eight upper-level business students in a focus group setting. To protect the

confidentiality of the research participants, we assigned each participant an alphabetic name. The demographic data of the participants is presented in Table 1.

Table 1
Demographics of L.A. Entrepreneur Participants

| | <i>Age</i> | <i>Gender</i> | <i>Race/Ethnicity</i> | <i>Marital Status</i> | <i>Type of Startup</i> |
|----------------------|------------|---------------|---|-------------------------------|------------------------|
| Participant A | 32 | Male | African-American or Black | Divorced | Services/ Professional |
| Participant B | 29 | Male | Hispanic or Latino | Single | Fashion |
| Participant C | 29 | Female | Hispanic or Latino | Married or Common Law Partner | Health and Wellness |
| Participant D | 22 | Male | Hispanic or Latino | Single | Film and Photography |
| Participant E | 21 | Male | Native Hawaiian or other Pacific Islander | Single | Health and Wellness |
| Participant F | 23 | Male | Asian | Single | Health and Fitness |
| Participant G | 22 | Male | White | Single | Fashion |
| Participant H | 21 | Female | African-American or Black | Single | Social Enterprise |

The research participants are mostly senior students and on track to graduate within six months at the time of the interview. Two out of eight student participants are women, which shows that our sample is almost representative of the national sample where 39% of all U.S. businesses are owned by women (Stockton, 2018). The majority of the student participants are keeping a good academic standing with a GPA above 2.9 out of 4.0. These nascent entrepreneurs are just starting or at the early stages of their startups. Most of these students are struggling financially while trying to balance work, study, their startup and family. Five students are currently employed part-time or full-time, while three students are not employed and looking for a job. Half of the participants' income is in the mid-level range of \$30,000 and above, whereas the other half of the participants earn less than \$20,000 annually which is more expected of students. Not only are most of these students self-funding their education and living independently, some of them even support family members financially. It seems that being engaged in a family business is more relevant as motivation for the students to start their own businesses than having professional experience. Two students have more than 10 years of professional experience, while others have less than 14 months. Three students are involved in family-related businesses. We discuss the participants' characteristics as important findings in the next two sections of this study.

What are the Drivers of Startup Growth?

According to our study’s nascent L.A. entrepreneurs, the principal elements of a vibrant entrepreneurial ecosystem (as depicted in Figure 1) are (a) an entrepreneurial culture, (b) a collaborative culture, (c) visible successes, (d) availability of capital and (e) availability of technical skills. In our study, we examine these elements as key drivers of startup growth in the Los Angeles area. Similar to Shirokova et al. (2016), our examination is divided into individual and environmental factors. Table 2 displays a summary of both drivers and inhibitors to startup growth for our study’s sample.

Table 2

Drivers and Inhibitors of Startup Growth for L.A. Entrepreneur Participants

| Drivers | | Inhibitors | |
|--|---|---|---|
| Individual Factors | Environmental Factors | Individual Factors | Environmental Factors |
| <ul style="list-style-type: none"> • History of family-owned businesses • Receiving social support • Independent and high achiever personality • Small victories | <ul style="list-style-type: none"> • Access to funding • Access to strong startup ecosystem in L.A. • Undergraduate education plays a role in decision to pursue entrepreneurship • Undergraduate education prepares for a career in entrepreneurship | <ul style="list-style-type: none"> • Challenges with startup formation • Ongoing startup challenges • Not receiving social support • Self-funding startup | <ul style="list-style-type: none"> • Lack of visibility of local incubators • Low visibility of resources for minority-owned small businesses |

Three individual factors that are discovered as being common characteristics among the nascent entrepreneurs include: (1) having family members who own their own businesses, (2) receiving social support from family, friends and community and (3) having independent and high achiever personality traits. A common theme that emerges during our focus group interview with the nascent L.A. entrepreneurs is that they have family members who own family businesses. Half of the entrepreneurs have a family member who has owned or currently owns a business. Stewart (2003) describes how the anthropology aspect of kinship theory influences family business. In our study, we assert that having family members who manage their own businesses is a driver of startup growth for nascent entrepreneurs. A second factor of startup growth for these entrepreneurs is having social support from their family, friends and communities. Social support can be tangible or intangible. All of the entrepreneurs in our study note that they receive encouragement from either their spouses, family members, roommates, friends, social media or monthly startup webinars. A third factor of success for these nascent L.A. entrepreneurs is having an independent, competitive and high achiever personality trait (Edelman, Brush, Manolova & Greene, 2010). A similar pattern of personality type is evident among all of the participants as they state how strongly

they feel about working for themselves, not intending to make someone else rich, creating value by being innovative and helping other people by creating jobs. This individual characteristic is compatible with the risk tolerance factor in Figure 1.

As illustrated in Figure 1, visible successes are an element of a vibrant startup ecosystem. A fourth individual factor relates to small victories that the nascent L.A. entrepreneurs encounter during their current startup stages. We ask the entrepreneurs to describe the victories they have had with their startups. Some of their victories are obtaining a website domain, trademarking logos, building relationships with social media influencers, securing people to help with prototype creation and selling out a first design.

Two environmental growth factors consist of the nascent entrepreneurs having access to funding and L.A.'s strong startup ecosystem. Availability of capital is an important environmental driver of startup growth. A majority of the entrepreneurs in our sample (75%) state that they will fund their startups on their own (via savings, residual income from investments, pre-orders or loans). Other sources of capital include family and friends, while 50% of the entrepreneurs say that they will use crowdfunding later during the more mature stage of their startup. A second startup environmental growth factor is entrepreneurial culture, which in our study is assessed by asking the entrepreneurs if they think that Los Angeles has a strong startup ecosystem. A majority (88%) of the nascent entrepreneurs believe that L.A. has a strong startup ecosystem in the form of supportive community, social connections and networking opportunities.

The last two environmental factors relate to the nascent L.A. entrepreneurs' undergraduate education. We ask the entrepreneurs two questions about their undergraduate education: (1) Do you think that your undergraduate education played a role in your decision to be an entrepreneur? and (2) Do you think that your undergraduate education prepared you for becoming an entrepreneur? In playing a role in their decision to become entrepreneurs, the students describe obtaining useful influences from studying finance, taking business classes, sharing free flowing ideas and having professors as mentors. In terms of preparation for entrepreneurial pursuits, the students state that their undergraduate education equips them with the technical skills to look at a business as an entity, write business plans, coordinate marketing campaigns, understand the accounting side, manage deadlines and build social capital.

What are the Inhibitors of Startup Growth?

For our qualitative study, we ask the nascent L.A. entrepreneurs questions regarding startup challenges, social support, funding sources, knowledge of incubators and awareness of resources available for minority-owned small businesses. The entrepreneurs' responses to these questions reveal startup growth inhibitors. Adapting Shirokova et al. (2016), we classify these inhibitors into individual and environmental factors as shown in Table 2.

The individual inhibitors include: (1) experiencing challenges in forming their startups, (2) facing ongoing startup challenges, (3) not receiving social support from close circles and (4) raising funding on their own. Some of the challenges that nascent L.A. entrepreneurs face in forming their startups involve raising capital from outside investors, forming the legal structure of their businesses, accessing resources on how to start their businesses, finding low-cost manufacturers, overcoming the growth obstacle of their business market share and increasing their social media influence. Furthermore, examples of nascent entrepreneurs' ongoing startup challenges include solidifying value propositions, obtaining tax advice, finding mentors, compiling research, creating content and managing time.

The third startup inhibitor is receiving discouragement from family and friends. Davidsson and Honig (2003) highlight how having encouragement from family and friends is a good predictor of nascent entrepreneurs' ability to carry their startup processes further. Discouraging social support affects a few of this study's nascent entrepreneurs in the form of their families telling them that business ownership is too risky or not providing them with financial assistance. The fourth startup growth inhibitor of this study is the desire for most of the entrepreneurs (75%) to raise funding on their own. The desire for nascent L.A. entrepreneurs to be independent is not surprising as discussed by Edelman, Brush, Manolova and Greene (2010) but this independence in relation to raising capital can slow down startup growth potential concerning obtaining additional external financing.

The inhibiting environmental factors consist of the lack of visibility of local L.A. incubators and resources that are available for minority-owned small businesses. Davidsson and Honig (2003) provide evidence that bridging social capital, specifically being a member of a business network, has a positive effect on achieving a first sale and profitability for nascent entrepreneurs. An incubator is an example of a business network that caters to startup companies by offering free resources (such as management training and office space) in order to speed up startups' growth and success. There are numerous incubators in the Los Angeles area including GRID110, Hub101, LA CleanTech Incubator and Viterbi Startup Garage (Built in Los Angeles, 2017). However, none of the participants in our study are a part of an incubator and only a few of them know what incubators are. Thus, the low visibility of this startup resource is an environmental growth inhibitor for the startups in our study.

The second inhibitor for the nascent entrepreneurs in our sample is low visibility of the resources available to minority-owned small businesses (minorities comprise 88% of our study's sample). Despite the fact that the Minority Business Development Agency Business Center of Los Angeles and the U.S. Small Business Administration offer services tailored for minority business owners, half of our study's sample do not know about these resources. One of the entrepreneurs even comments about traveling to another city (San Diego) to obtain resources for women startup founders.

Conclusion and Practical Implications

Overall Findings

Building on the model of the entrepreneurial process (Shane & Venkataraman, 2000) and Oracle's vibrant startup ecosystem diagram (Figure 1), our research sheds light on both individual characteristics and environmental factors as the key drivers or inhibitors of the growth of nascent startups in the Los Angeles area (Table 2). The findings of our qualitative research show that individual factors that can help the nascent startups grow include being involved in a family-owned business, receiving strong social support, being risk tolerant and experiencing visible victories. Moreover, environmental factors that can help the new startups' growth include awareness of and access to capital in L.A.'s startup ecosystem and having exposure to a strong educational program that allows them to develop technical skills and provides opportunities for relationships with mentors.

While these individual and environmental factors help the nascent startups grow, other individual and environmental factors may inhibit their growth. As the findings of this study illustrate: experiencing challenges in all startup stages (introduction, growth and maturity), not

receiving social support from close circles and struggling with self-funding are among the most important individual inhibiting growth factors. Despite L.A.'s strong startup ecosystem, it appears that the research participants do not have access nor the knowledge of how to gain access to local incubators and resources available for minority-owned small businesses. This lack of awareness and mentorship are environmental factors that inhibit the growth of this study's nascent L.A. entrepreneurs and their startups.

Practical Implications and Recommendations

The Los Angeles entrepreneurship ecosystem is developing strong environmental factors like those depicted in Figure 1 by trying to enrich the entrepreneurial culture, collaborative culture and regulatory environment. However, L.A. legislators and government agencies must consider other important factors that help or inhibit the success of nascent startups like those listed in Table 2. For example, results of this study indicate that the local government needs to find innovative ways to connect the city's entrepreneurship resources with nascent entrepreneurs. One suggestion would be to leverage academic programs and educational institutions as potential connector platforms. Another finding of this study is that there is a lack of knowledge about the resources available to minority-owned businesses. L.A.'s local government and city agencies need to have better targeting plans for minority entrepreneurs to increase awareness and bridge resources. Another suggestion would be to utilize local incubators in minority-serving cities and areas in L.A. County. Furthermore, one pressing dilemma that the nascent entrepreneurs have is how to use venture capital to grow without losing too much control and business ownership. Consequently, our policy recommendations include regulating lower interest rates for startup loans and offering alternative startup financing methods for nascent entrepreneurs to boost the entrepreneurship culture and foster a truly vibrant startup ecosystem in Los Angeles.

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NEW INTERNATIONAL SMES IN THE PHARMA–NUTRACEUTICAL MARKET

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SUMMARY: This study reflects upon the need for small and medium-sized enterprises (SMEs) in pharma–nutraceuticals to embrace business intelligence (BI) data analysis. SMEs in this field can best establish themselves as international SMEs and when a company first enters the market, it should be “born global” and have direct interactions with the global market, all while embracing the use of BI. Taking the case of the Swedish company MediTec International FairLife Group, this study examines how startup pharmaceutical SMEs in the United States and Europe can enter a market by taking a “born global” perspective that leverages online facilities.

Introduction

Small and medium-sized enterprises (SMEs) in the United States and Europe have in recent decades developed and gone from being minor players in local markets to essential actors in the global market. The introduction of online-based global standards for communication and analytics has made it possible for SMEs to function in the international market (Aspelund & Moen, 2001). In this way, SMEs can promote themselves as full-fledged international companies and as niche suppliers, as they develop and execute company-wide trade strategies for use on the global market (Loane, 2006).

It has become essential that SMEs in the pharmaceutical field set up a “born global” business intelligence (BI) strategy for marketing online and embrace international market expansion from their very inception (Emden et al., 2006). As e-market ownership structures remain open, a small-scale brand can make its way into a buyer’s consciousness (Freeman, Edwards, & Schroder, 2006). Perhaps more importantly, by following this strategy, an international SME (ISME) can preclude failure or mitigate the risk of being sold to investor conglomerates (Luostarinen & Gabrielsson, 2006).

Building a Knowledge-Based Organization and Business Intelligence

Alnoukari (2011) asserts that “Business Intelligence (BI) is a set of tools and techniques that can help organizations to collect, clean, and integrate all their data.” By leveraging BI, says Alnoukari (2011), “Organizations can then be able to analyze, mine, and dig more into their data in order to make the right decisions at the right time.”

MediTec International FairLife Group (MediTec Group), a Sweden-based ISME in the nutraceutical field, works with a variety of BI systems; for this company, these systems represent “the linking between competitive advantage and BI [that] appears as a critical point in company strategy and info systems” (Chen, Chiang, & Storey, 2012).

■ To optimize its BI management, MediTec Group makes a point of minimizing its number of stakeholders. BI supports business management by optimizing client relationships, controlling business ventures, and informing strategic decision-making wherever BI applications can be used in order to maintain distinct operations and leverage BI data usage (Negash, 2004).

Corporations use BI as a means of providing calculable and accurate data that will inform strategic decision-making, based on pressures seen in the business environment (Lönnqvist & Pirttimäki, 2006); various technologies and methods are used to understand company data and drive interactions between company partners and in-house divisions. Among those divisions, MediTec Group undertakes design collaboration with regard to business analysis work and analysis strategies involving suppliers and third-party partners; it also makes use of various in-house MediTec Group analytical results (Parenteau et al., 2016).

Building a Competitive Advantage

A competitive advantage derives from various resources and capacities that put a company in a position of performing better, relative to its competitors, in a specific market. To compete in international markets, transnational companies like MediTec Group need to enhance themselves in terms of three factors that can give a company a competitive advantage in the global market: a company and its products must be of value; the products are preferably unique; and the products are not easily copied or substituted, which allows them to withstand pressure from other companies and brands (Barney, 1991; Collis, 1991). These values and unique resources can bestow upon a company competitive advantages and serve as core competencies (Prahalad & Hamel, 1990), dynamic capabilities (Eisenhardt & Martin, 2000), and strategic assets (Amit & Shoemaker, 1993).

International companies continuously enforce strategies by which they can better position themselves and their products to create stronger fundamentals for expansion. In line with international organization theory, they may encourage—through the use of better BI—inter- and/or intra-organizational cooperation to achieve this advantage (Child, Faulkner, & Tallman, 2005).

MediTec Group creates its core products by leveraging raw and unique in-house materials; doing so constitutes a company advantage. Furthermore, MediTec Group has in recent years worked towards the creation of a competitive advantage in the form of reorganizing the company structure so as to site locations in countries and regions that have a distinct importance for the company. This reconstruction management, as part of an in-house international marketing strategy, can create an appropriate presence in multiple areas to build business environments where the company is active. For example, MediTec Group has opted to site its headquarters (HQ) in Dubai instead of Sweden (as was previously the case) because much of MediTec Group's business takes place in the Middle East, Africa, and Asia. The Dubai area is central to MediTec Group's business and is an international hub for BI management.

Dubai has in 20 years grown from a figurative “business desert” to a universal center for international trade; this has occurred on the basis of its cost-based logistical advantages, which foster a business environment in which companies can set up a central trade node for transnational business. MediTec Group maintains full ownership of its business in the free zones and this offers the company the highest standards of infrastructure and business environment. It also gives MediTec Group a competitive advantage, as 90% of trade in the United Arab Emirates comes from international business (MENA, 2017).

In MediTec Group, the introduction of marketing and sales efforts in the East Africa subsidiary has increased the need for the company to build a knowledge base to elevate its BI. This

BI will, in particular, relate to marketing efforts in the region but also aim to interlink with the HQ's manufacturing, logistics, and research and development (R&D) efforts with respect to the company's products to support them as well.

MediTec Group realizes that integrated intelligence on the business and the overall market from the perspective of a manufacturer derives from the knowledge base that the company collects from on-the-ground sales and marketing input. For this reason, MediTec Group has established the use of strict planning and reporting tools that capture general opinions on their products; the company also captures product responses from doctors, pharmacists, and end users. In this way, the company has been able to form an overall understanding of the market response from crucial opinion leaders, as well as responses from the market and reactions to sales initiatives.

MediTec Group has, based on these data, built a knowledge-based response system geared towards company-wide organizational improvement. This system has undergone constant development since September 2017, which has occurred in three distinct stages. In the first stage, the company used data to discover ways in which it could support marketing personnel on how to best expand into the existing market and reach virgin market segments. In the second stage, the company established new raw-material and production sites to accommodate needs anticipated by interpreting BI data. In the third stage, the company reconstructed its international organizational presence and set up its HQ in Dubai to synchronize BI management and establish better strategies by which it can support future logistics and company decision-making.

A Competitive Advantage: Cultural Differences In Meditec Group Global Markets

As much as cultural differences in various markets do not hinder MediTec Group as it evolves, it is most challenging to understand how to leverage intercultural business aspects to perform better as a company (Hofstede, 2002). On this point, MediTec Group understands that by approaching other cultures with humility and great respect, many problems that could otherwise arise can be handled and translated into market growth.

Building a Knowledge-Based Organization and Business Intelligence

MediTec Group is undertaking business performance management through the use of analytics and data mining (i.e., through the processing of records used primarily in in-house marketing and sales efforts). The on-the-ground sales teams of MediTec Group's subsidiaries use these data in tandem with rigid weekly planning formats and daily reporting structures. From these data, the company extracts statistics that are used to develop effective sales-oriented interactions with marketing and manufacturing divisions; these statistics are also used in in-house communications. These data are supplemented with datasets drawn from Amazon Analytics, Akida, Power BI, Google Analytics, and local stakeholders.

Setting Up Global Business Intelligence

To better establish its presence among local daughter companies and distribution partners, MediTec Group exercises polycentric management with the intention of creating a global environment in which BI stakeholders can interact and find common ground in optimizing interactions within the global BI team (GBIT). The company's R&D and manufacturing teams practice an ethnocentric strategy to minimize the risk of competitors learning in-house product and

manufacturing secrets. The company's GBIT, meanwhile, takes a geocentric approach to consciously optimize all parts of the company architecture and develop a more finely structured transnational BI management system (Korbin, 1994). In choosing candidates for a virtual BI management team, companies need to address cross-cultural issues and hire self-initiated people with good mental stability, empathy, and the ability to handle cultural discrepancies while holding a global mindset (Hill, 2016).

Establishing links among between the various parts of a company (i.e., R&D, manufacturing, international marketing, regional marketing, daughter companies, local production, and marketing efforts) is crucial in developing a global strategy that involves executive management (Daily, Certo, & Dalton, 2000).

To continuously educate itself, the GBIT uses Black and Mendenhall's (1990) three-dimensional typology to elevate cross-cultural competencies. The GBIT embraces both practical and theoretical training for expatriate management, which supports openness to new experiences and the development of the stable mindset needed to optimize BI management competencies (Leiba-O'Sullivan, 1999). Furthermore, training enhances previous cross-cultural work experiences, which may translate into certain desirable traits, such as cultural flexibility, less ethnocentrism, and a tolerance for ambiguity. These qualities form a stable foundation for an individual in performing well within a transnational group setting as a BI leader (Caligiuri & Tariqueb, 2012).

Internet Trade and E-Commerce

International trading facilitated by better logistics and communications—in addition to global marketing via websites, email lists, and social media—has revolutionized ISME capabilities and capacity. The result has been better-functioning businesses that operate and succeed in the global market (Luostarinen & Gabriellson, 2006). In the past 10 years, internet trade has taken a formidable position in international trade; this has been especially the case in China and the United States but internet trade is also growing elsewhere. People prefer to have goods sent directly to their home, as this allows them to conserve the energy they would otherwise spend in collecting products in a shop and transporting it home. The new understanding that shopping is something that can be done online and not in bricks-and-mortar shops is growing among the general public to the extent that e-commerce now represents about 10% of all retail sales in the United States and Europe (IPC, 2017). For an ISME to take part in the international market and secure its role in future trade routes, it must consider crafting and adhering to a strategy that considers the best approaches to online sales (i.e., e-commerce). There is a plethora of ways in which pharmaceutical ISMEs can partake in e-commerce but they must choose ways from which they will benefit in the long term. The MediTec Group leverages data from Akida, Google Analytics, and Power BI software to analyze the status quo and set up strategies by which it can make further improvements in its current-day markets; in this way, it can also improve its performance in terms of expanding to new markets.

International E-Commerce

Creating solutions with regard to ISMEs' e-commerce BI strategies—and for introducing new product sales—is challenged by differentiation in data inflows from local markets characterized by a variety of business cultures. Frequently, when setting up a company homepage

for e-trade purposes, higher costs often accrue with the introduction of products to local e-commerce markets or with price discriminations among various markets.

The solution promoted in this paper relates to e-commerce business analysis and sales in the context of an international e-commerce marketplace. By using an international trading platform, the marketing efforts already managed through an ISME's marketing strategy (through, for example, a global homepage, email lists, and regular updated social media postings) are enforced by commercializing the products through a distributor devoted specifically to international e-commerce. There are numerous e-commerce marketplace platforms but ISMEs in the pharma–nutraceutical field tend to opt for a marketplace that discriminates among markets in terms of both pricing and market approach; the ability to do so is essential to adaptive market differentiation.

Conclusion

The current study examined how startup pharmaceutical small and medium-sized enterprises (SMEs) in the United States and Europe can enter a market while taking a “born global” perspective—namely, by focusing on enhanced communication capacities, online logistics and marketing proficiencies, email lists, and social media.

Furthermore, this study highlighted that pharma–nutraceutical international SMEs (ISMEs) must consider the capacity of e-commerce business analysis management and adapt a BI strategy by which they can react to market responses and generate market growth in the future.

This study also examined business analysis in e-commerce and proposed that the use of business analytics in the e-commerce platform be considered a solution by which to offset the comparative disadvantages of being a new and minor player entering the market. This is especially the case for ISMEs, which can involve both in-house subsidiaries and distribution partners when reaching a fuller understanding of markets and how to integrate upcoming e-business market capacities.

The assertion is that ISMEs build competitive advantages by forming a global company BI structure that features cultural competence teams and by positioning the headquarters in an area that supports long-term strategies, which, in turn, support decision-making needed to make the company competitive.

The final recommendation is that smaller companies in the pharma–nutraceutical field set up a global strategy from the start based on marketing and sales networks that are fundamentally integrated. These networks can be integrated through business analysis management and transplanted into internet marketing and trade that support traditional sales networks (i.e., through distributors and in-house marketing) to build up company BI on a global scale.

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THE HIGHS AND LOWS OF STARTUPS IN THE CANNABIS INDUSTRY: A PESTLE ANALYSIS OF THE CURRENT ISSUES

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SUMMARY: With recreational cannabis now legal in ten US states, illegal cannabis growing operations are increasingly being replaced with regulated, taxed, and licensed businesses. Sales are predicted to increase roughly 35% from 2017, to more than \$8 billion by the end of 2018, and to \$22 billion by 2022. Projections like these have contributed to a startup boom in the cannabis industry unseen since the tech boom of the late 1990s. The aim of this paper is to highlight the unique issues faced by startups in the cannabis industry. We examine the elements that influence the cannabis startups by using the PESTLE framework which includes political, economic, social, technological, legal and ecological factors. We identify three types of cannabis startups and provide a brief analysis of differences between them as well as the challenges that they all face.

Introduction

With recreational use of cannabis currently legalized in ten US states, illegal cannabis growing operations are steadily being supplanted with regulated, taxed, and licensed businesses. Companies operating in these states are now able to legally produce and sell marijuana in their respective states. The 2018 Marijuana Business Factbook predicts sales to increase roughly 35% from 2017, to more than \$8 billion by the end of the year (Marijuana Business Daily, 2018). By 2022, sales in the United States are projected to increase by 250%, to \$22 billion. Projections like these have contributed to a startup boom in the cannabis industry unseen since the tech boom of the late 1990s.

A startup is defined as “a human institution designed to create a new product or service under uncertain conditions” (Ries, 2011, p. 8). The aim of this paper is to highlight the uncertain conditions faced by startups in the cannabis industry. Thus far, 33 states have some version of legalized cannabis (i.e., recreational and medical) and at least a half dozen more states expect to legalize cannabis within the next two years. Even with this current mass trend toward legalization, cannabis remains a Schedule I substance - equal to drugs like heroin and LSD - under the Controlled Substances Act, meaning it is prohibited under federal law to possess, use, manufacture, distribute, or sell cannabis. This means that growers, processors, and retailers cannot open accounts or access lines of credit from federally insured banks. They cannot write off business expenses when filing their taxes, and it is difficult to purchase crop insurance. As a result, this makes starting and operating a cannabis business arguably more challenging than other kinds of business. Among

many unexplored areas in the business literature on this topic are the classification of cannabis startups and the unique challenges they face.

Inspired by Gartner's (1985) framework for new venture creation we conducted a PESTLE (Political, Economic, Social, Technological, Legal, Environmental factors) analysis of the cannabis industry in an effort to determine the factors that affect cannabis startups and to discuss challenges that cannabis entrepreneurs should consider. In the absence of much rigorous academic research on the topic of the cannabis business we relied on business trade publications, newspaper articles, and online sources for this paper. We also interviewed two informants from the industry: a director of marketing for a large cannabis company and the CEO of a media agency that specializes in business-to-business cannabis marketing. We synthesize their views with our secondary sources.

Cannabis and Its Legalization in the United States

Cannabis is a tall plant with a stiff upright stem, divided serrated leaves, and glandular hairs that is indigenous to Central Asia and the Indian subcontinent (keytocannabis.com). It is used to produce hemp fiber and as a psychotropic drug. "Marijuana refers to the dried leaves, flowers, stems, and seeds from the *Cannabis sativa* or *Cannabis indica* plant which contains the mind-altering chemical tetrahydrocannabinol (THC) and other similar compounds" (NIDA, 2018). Throughout this paper we use cannabis and marijuana interchangeably to break monotony. Cannabis can be consumed in many different ways. Cannabis-based products include the broad categories of flower, edibles (e.g., candy, popcorn, cookies), topicals (e.g., lotion, pain relief, sunscreen, transdermal patch), dabbing (e.g., oils for use in bong), and concentrates (e.g., vape pens, tinctures). Price varies based on product category and other attributes, such as quality, supply, and THC content. Prices for flower are between \$200-300/ounce at a dispensary and \$250-300/ounce on the street. Prices for edibles range between \$10-15/100mg, topicals \$10-100/gram, dabs \$20-60/gram, and concentrates \$10-50/mg. Cannabis products can be purchased at legal dispensaries and through illegal street sales. There are strict restrictions to the way marijuana is promoted legally, and promotion regulations vary for other cannabis-based products like cosmetics and edibles. Social media, especially Instagram is widely used by illegal businesses to showcase their products.

In 1973, Oregon decriminalized and legalized recreational cannabis, and throughout the years other states including Alaska, California, Colorado, Maine, Massachusetts, Nevada, Vermont, Washington, and Michigan also legalized its use as of November 2018. One of our informants stated that only 10% of businesses selling cannabis flower are legal, the rest preferring to avoid the hefty and cumbersome legal work and licensing. These last two issues are among the many challenges legal cannabis startups face.

Cannabis Startups

Gartner (1985) introduces a conceptual framework for new venture creation which "integrates four major perspectives in entrepreneurship: characteristics of the individual(s) who start the venture, the organization which they create, the environment surrounding the new venture, and the process by which the new venture is started" (1985, p. 696). First, the individual differences refer to the differences in human capital such as knowledge, education, and skills (Deakins and Whittam, 2000) and in psychology such as personality characteristics (e.g., locus of control, need for achievement, risk-taking), cognitive approaches (i.e., how information is perceived, processed,

and communicated), and motivational patterns (i.e., the impetus for the startup) (van Gelderen, Thurik, Bosma, 2005). Second, the process refers to “how aggressively people pursue the completion of start-up activities,” (van Gelderen, Thurik, Bosma, 2005, p. 368) whether they work on their start-up full-time or part-time, and whether they work with a business plan or not. Third, *organization* refers to the structure of how the business will be set up. Lastly, the environmental factors that affect startups can be classified into network, financial, and ecological. Here Gartner’s (1985) use of the word *environmental* is a more encompassing term than a narrow understanding of the climate, and refers to the “relatively fixed conditions imposed on the new venture from” the outside of the business (p. 700). *Network* refers to the relationships between individuals (van Gelderen, et. al., 2005). Successful entrepreneurs have a diverse network of strong relationships with various people who can help them access resources (Aldrich, 1999; van Gelderen, et. al., 2005). *Financial* refers to the source and size of capital of the startup (van Gelderen, et. al., 2005). For example, a startup may have access to funds from a bank but may be exposed to too much risk from lenders which could limit the startup’s success and growth. *Ecological* refers to the environmental conditions that impact startups.

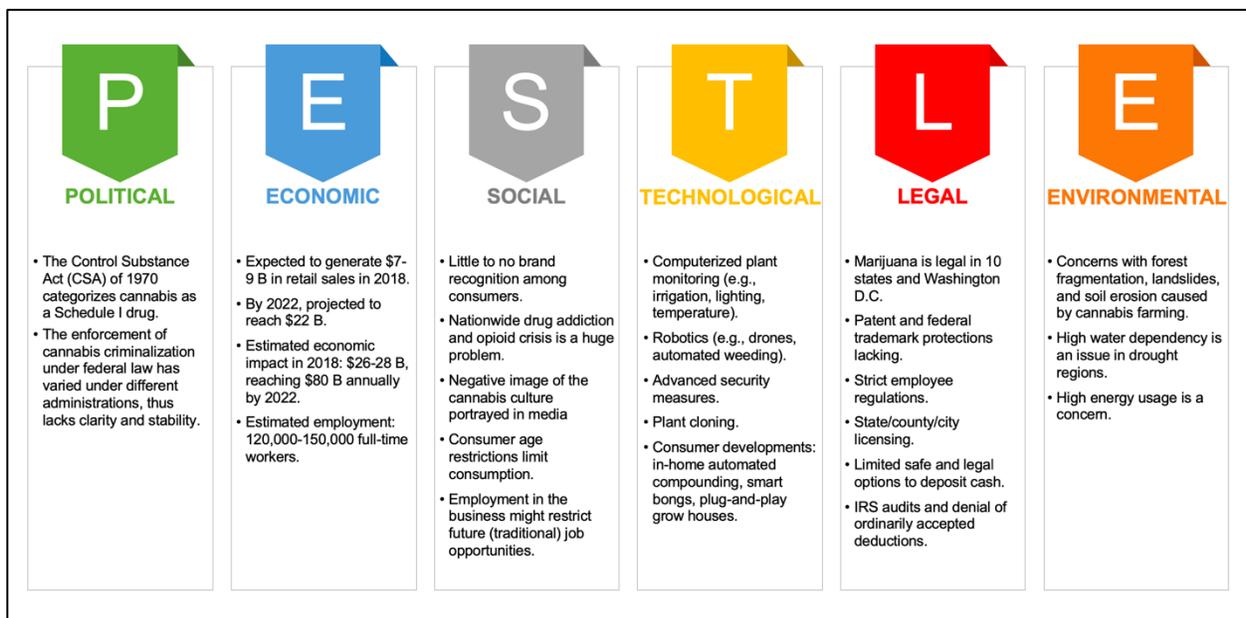
Due to recent decriminalization and legalization of recreational cannabis, we focus our analysis on the environmental factors within Gartner’s (1985) framework that affect cannabis startups. We use the PESTLE analysis to organize our findings.

PESTLE Analysis for Cannabis Startups

PESTLE is the acronym for a framework which analyzes the Political, Economic, Social, Technological, Legislative, and Environmental (mostly in the ecological sense) factors that have direct and indirect impacts on a business. In this section, we present a brief analysis of each element in relation to the cannabis industry. For an overview of the analysis, please see Figure 1.

Figure 1

A PESTLE Analysis of Cannabis Startups



Political

The political landscape around marijuana appears to be divisive with no signs of reconciliation. The Control Substance Act (CSA) of 1970 categorized various plants, drugs and chemicals into five “schedules” depending on the medical use and potential for abuse and addiction (Titus, 2016). Marijuana remains as a Schedule I drug which indicates that it has no medical benefits and high potential for abuse. One path to legalizing marijuana is to demonstrate its medical benefits through extensive research and large-scale clinical trials. Unfortunately, the illegal status of cannabis makes it highly problematic for researchers to conduct such studies. The Federal Government and its administration could be the catalyst to spearhead this process. Based on the current political milieu, it seems unlikely that Congress will reschedule marijuana. Various new acts have been proposed by both Democratic and Republican senators and congressmen but have all been rejected by the Senate and House Committees (Titus, 2016).

The enforcement of cannabis criminalization under federal law has varied under different administrations and lack clarity and stability. These mixed messages threaten new and existing cannabis industries, as well as individual users, within each legalized state. For instance, under the Obama administration, the federal government was generally more relaxed and did not pursue prosecution among states that have legalized cannabis, but instead issued federal memorandums that serve as guidelines and advice to federal prosecutors and law enforcement agencies. In contrast, under the Trump administration, Attorney Jeff Sessions rescinded the previous memorandums (Gurman, 2018) and began a “new war on marijuana legalization” (Lopez, 2018). While the Trump administration has publicly dismissed the Justice Department’s threat to interfere with the marijuana-related affairs of each state (Halper, 2018), “White House documents and interviews reveal the Trump administration has formed a committee tasked with objectives including smearing public support for marijuana” (Blake, 2018, para. 2).

Economic

The marijuana industry continues to grow exponentially. According to the 2018 Marijuana Business Factbook (Marijuana Business Daily, 2018), the industry is expected to generate \$7 billion to \$9 billion in retail sales in 2018, up from approximately \$1 billion in 2011. It is on pace for a 35% increase over 2017. Sales in the United States are projected to reach \$22 billion by 2022, a 250% increase from 2017. However, the rate of growth is abating in some key markets, including Colorado and Washington. The size and structure of cannabis companies run the gamut from single mom-and-pop dispensaries generating \$200,000 in annual revenue to the large, multimillion-dollar retail chains running commercial-scale grow facilities and operating dozens of stores. In 2018, the industry is projected to create \$26 billion-\$32 billion in economic impact, reaching \$80 billion annually by 2022. Employment in the cannabis industry is estimated at 120,000-150,000 full-time workers. This number is expected to reach 375,000 by 2022, a year-over-year growth rate of 22% (Marijuana Business Daily, 2018).

Social

As more marijuana startups enter the marketplace, entrepreneurs face unique marketing challenges. It has been only six years since recreational cannabis has been legalized in the states of Colorado and Washington and barely a month in Michigan at the time of our analysis. This is a very short time for brand recognition and brand loyalty to be formed among consumers, especially

when the promotion of the products is highly regulated with social media accounts routinely being shut down.

Because of the disparate feelings that consumers have towards marijuana, there are concerns that working in the cannabis industry may stigmatize those who might want to pursue ‘traditional’ professions in the future (e.g., politics, law enforcement). However, as the cannabis industry gains mainstream acceptance, the stigma around working in the industry will likely dissipate (Furore, 2018).

Moreover, marijuana is reported to be the most-abused drug in the United States, particularly among young people (SAMSHA, 2016). The National Institute on Drug Abuse (NIDA) (2016) reports that marijuana use has short- and long-term effects and despite being rare, it is possible to overdose on marijuana. While hallucinations, delusions and psychosis are among short-term effects when taken in high doses, marijuana affects brain development in the long run (NIDA, 2016).

Technological

There have been wide-ranging technological developments targeting both companies and consumers within the marijuana industry. Examples of developments targeting companies include computerized plant monitoring (i.e., irrigation, lighting, temperature), robotics (e.g., drones, automated weeding), advanced security systems, and plant cloning. Consumer developments include in-home automated compounding, smart bongos, and plug-and-play grow houses.

Legal

Despite the growing movement towards state legalization, marijuana remains illegal at the federal level. For example, the Federal Government (i.e., the Department of Justice and the Drug Enforcement Administration) continues to crack down on marijuana dispensaries by way of raids and arrests (Fishman, 2018). Currently, the Internal Revenue Service (IRS) is getting involved and this is affecting marijuana-related businesses. Federal regulations regarding money-laundering and criminal activity, for instance, deter most banks from accepting deposits from marijuana business owners. While banks are not prohibited from working with cannabis businesses, the requirements necessary to avoid penalties and charges outweigh the benefits. For instance, banks must submit lengthy and detailed “suspicious activity reports” to the government and adhere to a laundry list of regulations set by the IRS and the Financial Crimes Enforcement Network (Klein, 2018). Despite this, “more than 360 banks and credit unions work with marijuana-related businesses, filing more than 2,000 suspicious activity reports a month (Klein, 2018).” However, major banks and credit card companies remain cautious and refuse to service marijuana-related businesses to avoid penalization and loss of business (Staggs, 2017). As such, many cannabis businesses are limited in their options to safely and legally deposit their cash.

The IRS has also “begun enforcing a little-known law adopted in the 1970s that bars tax deductions for business expenses incurred by drug dealers” (Fishman, 2018). Because marijuana dispensaries are considered illegal and seen as drug dealers, the IRS does not allow these owners to deduct business expenses that are permitted for other businesses such as cost of goods sold (related to the trafficking of marijuana), rent, advertising, depreciation, legal fees, wages, utilities, and security services. Since 2008, the IRS has audited major marijuana dispensaries and denied them these deductions (Fishman, 2018).

Environmental

Bauer et. al (2015) report that “[t]he environmental impacts associated with marijuana cultivation appear substantial, yet have been difficult to quantify, in part because cultivation is clandestine and often occurs on private property” (abstract). While it has been difficult to measure the environmental impacts of the marijuana industry precisely since many farming practices have been underground, according to Wang et. al. (2017), cannabis agriculture has been found to be detrimental to the livelihood of diverse ecosystems surrounding it. Due to its illegal nature, the cannabis crop has been traditionally grown in remote locations such as forests, which are hard to reach by law enforcement agencies. This has led to forest fragmentation, stream modification, soil erosion, and landslides (Wang et. al. 2017).

Moreover, cannabis agriculture has a high ecological footprint with its high demand for electricity and water necessary to grow the crops indoors under lamps, ventilate and air condition the farms as well as grow the water-hungry plants. It has reported that “[a] study by scientist Evan Mills, with the Lawrence Berkeley National Laboratory, revealed that legalized indoor marijuana-growing operations account for 1% of total electricity use in the US, at a cost of \$6 billion per year. Annually, such consumption produces 15 million tons of greenhouse gas emissions (CO₂), equal to that of three million average cars” (Sevcenko, 2016, para. 5).

A Typology of Cannabis Startups

Once we gained a better understanding of the macro environmental factors affecting cannabis startups, we sought more insight from those within the industry. We interviewed two business professionals: a director of marketing for a large cannabis company and the CEO of a media agency that specializes in business-to-business cannabis marketing. The interviews lead us to identify and define three types of cannabis startups.

Existing and Pursuing Licensing (EPL)

EPLs are businesses with an existing license to operate in the medical marijuana industry prior to the date that recreational cannabis was approved in their respective state. These companies are currently going through the legal process to sell recreational cannabis. EPL companies know the business intimately. They have an advantage because they are used to operating in this quasi-legal environment. For years, and in some cases, decades, EPLs operated their businesses in an environment where cannabis was tolerated but unregulated. EPL companies rely heavily on established trust networks. Having survived, they have mature marketing skills. They know the industry and their consumers well; however, they often practice more traditional branding and marketing techniques.

New and Pursuing Licensing (NPL)

NPLs are businesses without a license to operate in the medical marijuana industry before the date that recreational cannabis was approved in their respective state. Like EPLs, these companies are currently going through the legal process to sell recreational cannabis. Many NPL companies enter the marketplace with no prior cannabis experience. However, they bring with them advanced marketing and business skills. NPL companies focus on the financing, regulations,

and marketing before entering the industry or manufacturing products. Their lack of experience requires a learn-by-doing strategy. Hence, NPL firms rely heavily on consultants and experts.

Guerilla Operator (GO)

GOs are businesses that operate outside of the current regulations in states where cannabis is legal or illegal. GOs do not want to go through the licensing process. Reasons for noncompliance include punitive regulations, cost, effort, and time. Because of state track and trace programs, these firms routinely sell their goods in states where recreational cannabis remains illegal; however, they remain staunch competitors to EPL and NPL firms in states where recreational cannabis is legal. Guerilla operators often use “burner phones” that cannot be traced back to the caller and Gmail to communicate with consumers. They use social media accounts, generally Instagram, to market products. GOs display products, but do not indicate that they are for sale. Rather, they write “DM (direct message) for details” on product posts. GOs cater to those who do not want to buy cannabis from legal outlets or in states where recreational use remains illegal.

Figure 2

Typology and Comparison of Cannabis Startups

| |  |  |  |
|-----------------------------|--|---|--|
| TYPE OF STARTUP | EXISTING & PURSUING LICENSING | NEW & PURSUING LICENSING | GORILLA OPERATORS |
| MAIN CHARACTERISTICS | Existing license to operate in the medical cannabis industry prior to the date that recreational cannabis was approved in their respective states. | No existing license to operate in the medical cannabis industry prior to the date that recreational cannabis was approved in their respective states. | Operate outside of the current regulations in states where cannabis is legal or illegal. |
| MARKETING | Tried-and-true marketing techniques. | Advanced marketing techniques. | Use burner phones, email, and social media. Do not list products for sale. |
| CONSUMERS | Appeal to long-standing cannabis users who know these companies and their products. | Appeal to consumers new to cannabis. | Cater to those who do not want to buy cannabis from legal outlets or in states where cannabis remains illegal. |
| STRENGTHS | Have developed large trust networks. Know their customers well. Are used to operating in a quasi-legal environment. | Focus on financing, regulations, and marketing before entering the industry or manufacturing product. | Have developed large trust networks. Lower operating costs and higher margins. |
| WEAKNESSES | Often practice dated branding, marketing strategy, and business techniques. | Many enter the industry with no prior cannabis experience. Learn-by-doing strategy. Rely on consultants and experts. | Marketing and business strategies limited by decision to operate illegally. |
| CHALLENGES | Surviving with staunch competition from NPL and GO companies. | Surviving while establishing themselves in a crowded industry with little experience. | Surviving while skirting federal and state regulations. |

Challenges Facing Cannabis Startups

Based on the PESTLE analysis and interviews, we present some of the major challenges cannabis startups face, how they are affected by these factors, and how they operate within these constraints. We summarize these under the categories of laws and regulations, business operations,

and marketing. The challenges cannabis startups have, in many ways, are different from other startups. In particular, the fact that marijuana is illegal at the federal level and yet legal only in some states creates its unique problems when it comes to operating the business and marketing the products.

Laws and Regulations

Federal illegality, a myriad of state, county, city regulations, and licensing issues are the key challenges in the cannabis industry; however, there are several others. The principal challenge is that the federal government defines cannabis as a Schedule I drug under the Controlled Substances Act. Although the federal government has mostly refrained from intervening in states that allow legal marijuana businesses, its ambiguous legal status creates unique legal challenges and an uncertain future. As of 2015, the latest available data shows 12.4 % (11,533) of the 94,678 federal inmates incarcerated for a drug violation as their most serious offense are serving time for violating cannabis laws, with an average sentence of 88 months (Taxy, et.al., 2015).

The number of state agencies regulating the cannabis industry range between one in Oregon and Washington and seventeen in California. Most states have decided to divide oversight among numerous agencies, each of which requires a separate permit and fee. Additionally, there are county and city cannabis regulations, which may vary drastically within a particular state. Separate licenses are required for each of the following business types: growers, manufacturers, wholesalers, testing facilities, retailers, distributors, and microbusinesses. In some states (e.g., Washington), one business cannot hold all types of licenses available.

Business Operations

Security procedures are generally regulated at the state level. These procedures include employee background checks, roles and responsibilities of all employees, inventory management systems, how access points (i.e., doors and windows) will be secured and types of locks used, types of cameras and video storage equipment, the number and placement of cameras, the security alarm company, and the number and hours of on-site security personnel.

Conventional banking is often inaccessible to cannabis companies. Growers, processors, and retailers cannot open accounts or access lines of credit from federally insured banks. Many dispensaries struggle with payroll issues. It is still common for cannabis companies to pay employees in cash, which can potentially create dangerous situations for both companies and workers. However, electronic payroll options that cater to the cannabis industry are becoming more prevalent (Mihelich, 2017).

Waste removal is a challenge generally not associated with startups. Because waste byproducts may still contain federally regulated substances, cannabis waste is currently considered a medical byproduct or hazardous waste. Waste removal companies must be specifically licensed to transport, handle, and process cannabis material.

Marketing and Promotion

Many types of startups attempt to protect their intellectual property with patents. Moreover, startups use federal trademarks to protect branding elements. Because of the federal illegality, cannabis companies are not afforded these protections. However, cannabis startups can obtain trademark protection at the state level.

The process of getting product to market is protracted. In many states, manufacturers cannot introduce product directly into the market. The process will often resemble this: 1) manufacturer sends product to distributor, 2) distributor sends product to testing, 3) lab tests product and returns product to distributor, and 4) distributor sends the product to retailers. If a manufacturer operates a distribution operation, it must be physically separate from the manufacturing facility. Labs cannot be owned by the manufacturer. Regulations often restrict the dollar amount of product onboard any one vehicle.

Promotion and packaging present challenges. Retail products must be child-proofed. The amount of THC in edibles cannot exceed established limits per piece (e.g., 10 mg). In the case of multipacks (e.g., six brownies), each item in the pack must be at or below the established limit.

Restrictions on promotion vary by state, but share several commonalities. Generally, products cannot represent curative or therapeutic use, specifically target individuals under the age of 18-21, including cartoon characters or similar images, be located within 500-1000 feet of child centers, on a public facility or vehicle, and post-secondary campuses. Retail outlet signage and product labels must convey the detrimental effects of cannabis usage. Social media accounts are routinely shut down due to platform-specific violations, making it difficult to present a consistent message across platforms.

Conclusion

As laws regulating the cannabis industry are rapidly changing, they are creating new challenges to the various types cannabis startups. In this paper, we analyzed the industry based on a number of factors and provided a typology of cannabis startups. The topic is ripe for future academic research to provide new theories for startups operating in unchartered territories where the legality of the product changes depending on the state and federal governments.

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A NEW PROJECT MANAGEMENT FRAMEWORK FOR STARTUPS: AGILE WORKSYSTEMS

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SUMMARY: Agile development methods have become very popular, specifically with software startups. Extant literature does not emphasize the decision-making processes of agile developers, particularly in startups. The goal of this research is to propose a framework where startup developers make these decisions and how those processes align with customer needs.

Introduction

Despite the growth in startups, the Bureau of Labor Statistics claims that more than half fail in the first few years (Mansfield, 2016). Surprisingly, more startups fail for management issues such as bad teams, miscommunication with customers, and incompatible product design than technical issues (Cantamessa et al., 2018), highlighting the need for startups to balance technological issues with management issues. Startups have been adopting a newer project management methodology called Agile, which has become very popular over the last ten years, especially when it comes to rapidly changing business requirements (Giardino et al., 2014).

Models for comparing software development life cycle methods have been well established (Davis et al., 1988), and methods for assessing the personalities of agile developers have been developed (Balijepally et al., 2006). But there has been scant literature focusing on the decision-making processes of agile developers, particularly in analysts working in startups.

In traditional software development approaches, analysts developed detailed requirements to satisfy customer needs, and then programmers implemented those, with little decision-space of their own. Programmer decisions were usually limited to technical implementation details. However, in agile development, programmers are given very high-level, brief descriptions of user needs and are given significant leeway to implement them as they see fit (Anwer et al., 2017). Startups seek to balance the technological and managerial aspects of startup project management (Devadiga, 2017); and startups need a lens through which to examine complex decision-making processes engaged in by developers participating in agile software development teams. The following sections will describe the agile development and examine the Work System Theory as a way of understanding how agile developers make decisions.

Agile Development

Even with the tremendous strides made in software development, as evidenced by the rich array of methods, tools, and techniques, about 19 percent of all software projects are never completed, while another 46 percent are categorized as “challenged.” These challenged projects are operational, but over budget, missed deadline, and completed with fewer features and functions than originally specified (Hughes et al., 2016; Hughes et al., 2017). With the growing frustration spurred by the low success rates of software projects, in addition to the imperative for

responsiveness and agility, developers are obliged to think about and invest in an array of development methods that differs appreciably from traditional software practices.

These new methods, labeled Agile Development Methodologies, aim to expeditiously deliver software of high-quality and value to customers by emphasizing the following: (1) collaborative and empowered teams unfettered by rigorous processes; (2) simplicity of design and minimal critical specifications, while documenting only what is absolutely necessary; (3) active involvement of preferably collocated customers; and (4) inevitability of change and an understanding that it may be leveraged through rapid iterations, feedback, and constant reflection on the consequences of actions (Cockburn et al., 2016; Cockburn and Highsmith, 2001). A singularly distinctive feature of these methods is the premium they place on collaborating and self-organizing teams (Cockburn, 2006). The popularity of Agile has been growing for more than ten years. In a survey of software developers conducted during March 2007, 69 percent of respondents indicated that their organizations were using agile methods and another 7.3 percent hinted that they should be going agile within the next year (Boehm, 2007). Since then, Agile methodologies have become widespread in the industry (Bonner et al., 2016).

The goal of agile methods is to help software development organizations to quickly develop and change their products and services, thereby providing the ability to adapt to dynamic market conditions (Boehm, 2002). Agile methods such as Extreme Programming (XP) advocate iterative development, frequent consultation with the customer, small and frequent releases, and rigorously tested code (Ambler, 2002).

Challenges to adopting agile methods

When startups seek to use agile methodologies, they face the following challenges.

1. Development Process-related Challenges

Agile methods value a working system over documents. No formal architecture design is included in a typical agile approach. However, the lack of architectural scalability can raise a serious concern for relatively large projects. Without a formal design phase, many design problems may be ignored (Erickson et al., 2005). For example, agile development teams may make irrecoverable architectural mistakes due to inadequate attention paid to architectural design (Boehm, 2002).

2. Customer-related Challenges

Agile methods rely on inputs from on-site customers instead of predefined requirements documents (Beck and Gamma, 2000). The focus is rather on how to better handle inevitable changes throughout the life cycle than to minimize changes in a project. Agile methods respond to this expectation by adopting strategies designed to reduce the cost of change throughout a project (Cockburn and Highsmith, 2001). The team can obtain immediate feedback and information by closely working with on-site customers. However, customers' insufficient knowledge of the requirements due to the complexity and size of the system poses significant challenges (Cao and Ramesh, 2008). These challenges are even more pronounced when customers are not available or not willing to commit to the project (Fitzgerald et al., 2006).

3. *Developer-related Challenges*

As agile methods rely heavily on tacit knowledge embodied in development teams, all team members co-locate in the same room and stand-up meetings among team members take place daily, but critical decisions may be left undocumented. There is a lack of formal history of the project for team members to trace and understand the evolution of the system. Communication strategies adopted by agile methods work well for small, highly cohesive teams. However, their use in large, complex projects may result in several challenges. Informal communication may not be effective when dealing with a large number of stakeholders and vast amounts of information (Fitzgerald et al., 2006).

4. *Organization/Management-related Challenges*

Agile methods recommend decentralized decision-making. Every team member is informed of the progress of the project and is empowered to make decisions on his/ her own. Agile methods work well in organizations that have a flat organizational structure. However, in organizations that are used to deep hierarchical and centralized decision-making structure, they may conflict with the organizational culture, causing resistance between top management and team members (Boehm and Turner, 2003).

5. *Agile Work Systems*

Agile methods are described as lightweight processes that employ short iterative cycles that actively involve users (Boehm and Turner, 2005). The agile developers' involvement fosters the environment for collaboration to establish, prioritize, and verify requirements. Development process relies on a team's knowledge and collaboration as opposed to documentation. The Agile method must be iterative, incremental, self-organizing, and emergent (Williams, 2010).

Work System Framework and Agile Development

Given these persistent challenges, this study proposes that Agile methodologies, especially in startups, utilize a fundamentally different lens of work system theory (Alter, 2010). Instead of agile being seen as a "development" methodology, it can be viewed as a "work system." A work system is a system in which human participants and/or machines perform work (processes and activities) using information, technology, and other resources to produce specific products/services for specific internal and/or external customers (Alter, 2018). Thus, human participants are viewed as part of a work system rather than as users of a work system. From this definition, it can be seen that in an agile delivery, a team is performing some kind of "work." Applying this work system theory to agile startup teams would bind all involved stakeholders more clearly.

This work system can easily be adapted to agile environments for startup teams. Note that WorkSystem does not require a detailed requirement or any other traditional methodology. In terms of WorkSystem Theory (WST), an agile can be seen as an "agile work system" in which agile developers in startups perform sprints using the information gathered from customers for those customers.

Figure 1:

WorkSystem Framework Components (Alter, 2013; Alter, 2018)

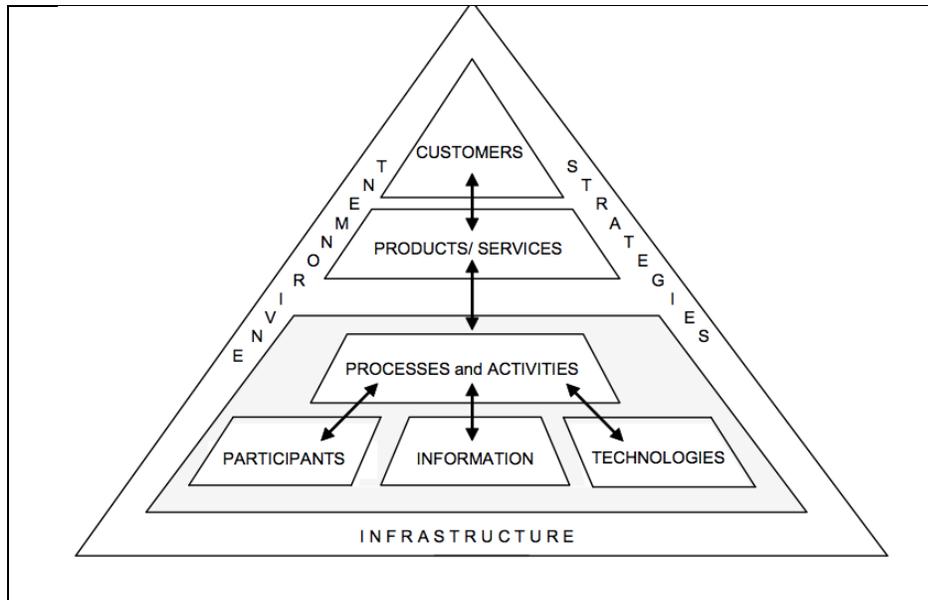


Figure 1 describes the nine main components of the WorkSystem. Table 1 summarizes the work system framework components and provides the description and matches the similar concepts from agile manifesto as discussed in Fowler and Highsmith (2001) as guidelines for startup teams.

Table 1

WorkSystem Components Mapping to Agile Startups

| Framework Component | Description and example (adapted from Alter (2013)) | Agile Example (Adapted from Agile Manifesto (Fowler and Highsmith, 2001)) |
|--------------------------|--|--|
| Processes and activities | Processes and activities occur in a work system to produce products/services for its customers. Many important work systems perform organized activities that rely heavily on human judgment and improvisation (e.g., Hall & Johnson, 2009; Hill, Yates, Jones, & Kogan, 2006) | Agile processes harness change for the customer's competitive advantage. For startup projects, processes would be customer-centric rather than technology-centric. |
| Participants | Participants are people who perform work within the work system, including both users and non-users of IT. | Developers and Customers work together in an agile environment. Forces startup teams to view customers as participants. |

| | | |
|--------------------|--|---|
| Information | All work systems use or create information, which in the context of work system analysis is expressed as informational entities that are used, created, captured, transmitted, stored, retrieved, manipulated, updated, displayed, and/or deleted by processes and activities. | The most efficient and effective method of conveying information with and within a development team is face-to-face conversations. |
| Technology | Almost all significant work systems rely on technology to operate. Work systems are not all about the tools (Alter, 2013) | Deploy all the tools, technologies and processes, but even in agile processes, in the end, it is people who make the difference between success and failure. |
| Products/ services | Work systems exist to produce things for their customers. Ignoring what a work system produces is equivalent to ignoring its effectiveness. Products/services consist of information, physical things, or actions produced by a work system for the benefit and use of its customers. | The main priority for agile is to satisfy the customer through early and continuous delivery of valuable software. Customer-centric product development would lead to more success for startups. |
| Customers | Customers are recipients of a work system's products/ services for purposes other than performing work activities within the work system. Since work systems exist to produce products/services for their customers, an analysis of a work system should consider who the customers are, what they want, and how they use whatever the work system produces. | The volatility associated with today's projects demands that customer's value be re-evaluated frequently, and meeting original project plans may not have much bearing on a project's ultimate success. |
| Environment | The Environment includes the relevant organizational, cultural, competitive, technical, regulatory, and demographic environment within which the work system operates, and that affects the work system's effectiveness and efficiency. | Build projects around motivated individuals, give them the environment and support they need and trust them to get the job done. |
| Infrastructure | Includes human infrastructure, informational infrastructure, and technical infrastructure | Agile processes promote sustainable development; sponsors, developers, and users should be able to maintain a constant pace indefinitely. |
| Strategy | In general, strategies at the three levels (work, department, enterprise) should be in alignment, and work system strategies should support department and enterprise strategies. | Giving people a simple set of rules and encouraging their creativity will produce far better outcomes than imposing complex, rigid regulations. |

As can be seen from Table 1, the main elements from agile manifesto can be represented in WorkSystems and used by startup teams. Both agile and WorkSystem framework are customer-centric systems. By combining these two approaches, startup teams can manage projects better via agile methodology and bridge the technology-business gap via WorkSystem Theory. Many managers or organizations may feel trepidation in using agile because of the perceived lack of control and processes. However, adapting WorkSystem components in agile would provide some structure while allowing the main elements of agile to function efficiently.

Conclusion and Future Directions

Agile project management methodology has become mainstream over the last decade. Several studies have outlined the benefits of Agile over traditional project management, such as greater customer involvement and better cohesion in teams. In startups, teams need to quickly become acclimated to become business environment and offer customer-centric products. Hence, in addition to a project management methodology, startups need a business/customer management primer that bridges the technology-business gap. This short study proposes WorkSystem framework as a tool for startup agile teams.

This study has a number of limitations. This study does not distinguish different variations of Agile methods such as Scrum, Feature Driven Development (FDD), and Crystal. Similarly, this study applies the generic term *startups* ignoring differences between tech startups and non-tech startups. Future studies could focus on implementing these frameworks in different agile methodologies as well as in various types of startups. The framework illustrates how startups can involve customers during the product development lifecycle. Follow up studies could validate and refine the framework further.

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WHAT BUSINESS ENTITY SHOULD A STARTUP CHOOSE?

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SUMMARY: What business entity the owners of a startup business choose will determine the tax and non-tax consequences for both the owners and the startup. However, by understanding the similarities and differences of business entities, owners can choose the best business structure for their startup business. As an aid in the process of choosing a business entity for a startup, this paper provides an overview of the rules, requirements, advantages, and disadvantages of several business entities.

Introduction

Should a startup business be structured as a sole proprietorship or as a partnership? What are the tax consequences if a startup business is a C corporation instead of an S corporation? Will the startup's owners be personally responsible for the startup's debts, if it is structured as a limited liability company? The choice of a business entity for a startup is an important decision, because which entity is chosen will determine the tax and non-tax consequences for the startup business and its owners. In this paper, the rules, requirements, advantages, and disadvantages of several business entities are discussed and illustrated through examples.

Business Entities

Sole proprietorships

A sole proprietorship is a business organized under state law and is owned by one individual. Because sole proprietors have unlimited personal liability for the proprietorship's debts, obligations, and other liabilities, claims can be filed against both the proprietorship's and the proprietor's personal assets (Treas. Reg. § 301.7701-3(b)(2)(ii)).

A sole proprietorship does not pay tax on its income, rather its income, losses, deductions, and credits pass through to the sole proprietors, who are taxed on the proprietorship's income at their individual tax rates (26 U.S. Code §§ 1(j)(1) and (2)). For federal tax purposes, sole proprietors can deduct from their proprietorship's income an amount equal to the lesser of 20 percent of their taxable income or 20 percent of the sole proprietorship's qualified business income (Q.B.I.), which is income effectively connected with a U.S. trade or business. Therefore, by claiming the 20 percent pass-through deduction, 80 percent, not 100 percent, of a sole proprietorship's Q.B.I. is subject to tax. (26 U.S. Code § 199A).

Sole proprietors can use the proprietorship's losses, deductions, and credits to offset other income reported on their own tax returns, such as offsetting a capital gain realized from selling their own capital asset with a capital loss realized by the sole proprietorship.

Under the Self-Employment Contributions Act, sole proprietors pay self-employment taxes of 15.3 percent on the sole proprietorship's income, which is a combined 12.4 percent tax for Social Security old age, survivors, and disability insurance and a 2.9 percent tax for Medicare hospital insurance. An additional Medicare tax of 0.9 percent may also apply if the sole proprietor's total self-employment income exceeds certain limits. (26 U.S. Code §§ 1401(a) and (b)). Because sole proprietors are not considered employees of a sole proprietorship, they do not pay the 6 percent Federal Unemployment Tax (F.U.T.A.) on their income. (26 U.S. Code § 3301).

C corporations

A corporation (referred to as a C corporation for federal tax purposes) is a business entity organized under state law with its own rights and privileges and is separate and distinct from its owners, the shareholders (26 U.S. Code § 7701(a)(3); Treas. Reg. §§ 301.7701-2(a) and (b)). A corporation is formed by investors, who become shareholders of the corporation, contributing cash, property, and/or services in exchange for stock in the corporation (26 U.S. Code § 351(a)). A corporation can have one shareholder or an unlimited number of shareholders. Shareholders can be U.S. citizens and residents, domestic and foreign corporations, partnerships, and other entities (e.g., California Corp. Code §§ 162 and 200).

A corporation can issue different classes of stock, such as common stock with voting rights and preferred stock with rights to receive dividends from the corporation (e.g., California Corp. Code § 400). A corporation's stock can be privately held or following an initial public offering, traded on a stock exchange, like the New York Stock Exchange.

A corporation's shareholders, board of directors, and officers have limited personal liability, referred to as the corporate veil, for the corporation's debts and liabilities. However, in certain circumstances, such as when a corporation is engaged in fraudulent activities or is a sham corporation, the corporate veil can be lifted and the shareholders, board of directors, and/or officers will be held personally liable for the corporation's debts and obligations. However, the shareholders' personal liability is limited to the amount they invested in the corporation.

A C corporation's income is subject to double taxation because it is taxed at both the corporate (or entity) level and at the shareholder level. A C corporation pays tax on its earnings and profits at the current flat corporate income tax rate of 21 percent (26 U.S. Code §§ 11(a) and (b)). And, if its earnings and profits are distributed to its individual shareholders as a qualified dividend, meaning that the shareholders received the dividend from domestic or certain foreign corporations and held the stock for a certain number of days, the shareholders pay tax on the dividend at the current dividend income tax rates of either 0, 15, or 20 percent (26 U.S. Code §§ 1(h)(11)(B), 61(a)(7), 301(c)(1), and 316(a)). A shareholder's distributive share of a corporation's earnings and profits are not subject to employment taxes. However, under the Federal Insurance Contributions Act (F.I.C.A.), both C corporations and their shareholders are required to pay employment taxes of 15.3 percent on distributions to shareholders for providing services to the corporation with the corporation and shareholders each contributing 6.2 percent for Social Security and 1.45 percent for Medicare. (26 U.S. Code §§ 3101 and 3111). Also, C corporations pay the 6 percent F.U.T.A. tax on distributions to shareholders for performing services for the corporation. (26 U.S. Code § 3301).

Because corporations can classify distributions to shareholders as wages or amounts not subject to employment taxes, such as dividends and loans, corporations cannot avoid employment

taxes by paying shareholders dividends or other amounts in lieu of reasonable compensation for services performed for the corporation. The I.R.S. may re-classify distributions to a shareholder as wages subject to income and/or employment taxes if in reality the payments were for services the shareholder provided to the corporation. Or, if the shareholder was compensated, the I.R.S. may determine that it was not reasonable. Factors used by the I.R.S. and courts to determine reasonable compensation include: training and experience, duties and responsibilities, time and effort devoted to the corporation, and payments to non-shareholder employees. (*Gale W. Greenlee, Inc. v. United States*, 1985 and I.R.S. Fact Sheet FS-2008-25).

Partnerships, limited liability companies, and S corporations Pass-Through Entities

For federal income tax purposes, there are three types of pass-through business entities: partnerships, limited liability companies (L.L.C.s), and S corporations (26 U.S. Code § 1(h)(10)). Like sole proprietorships, pass-through entities do not pay federal taxes on their income, rather their income, losses, deductions, and credits pass through to their respective owners, the partners, L.L.C. members, and S corporation shareholders, who pay tax on their share of the pass-through entity's income at their own income tax rates (26 U.S. Code §§ 701, 702, 703, and 704). Similarly to sole proprietors, owners of pass-through entities can use their share of the pass-through entity's losses, deductions, and credits to offset other income.

Like sole proprietors, individual owners of domestic pass-through entities can claim a deduction equal to the lesser of 20 percent of the pass-through entity's Q.B.I. and 20 percent of the owner's taxable income, thereby reducing the amount of the entity's Q.B.I. subject to federal tax by 20 percent. However, except for engineers and architects, traditional service providers, such as doctors, attorneys, and accountants, whose business is organized as a pass-through entity, cannot claim the 20 percent pass-through deduction (26 U.S. Code §§ 199A(a), (b), (c), and (d)).

For federal income tax purposes, a pass-through entity can elect, under the "check-the-box regulations" to be taxed like a C corporation, rather than taxed like a pass-through entity. By electing to be taxed as a C corporation, the pass-through entity's income will be taxed at both the entity level and at the owner level, rather than taxed only at the owner level (26 U.S. Code § 7701; Treas. Reg. §§ 301.7701-1 to -3). For example, an L.L.C. with one owner is generally taxed like a sole proprietorship, but under the check-the-box regulations, it can elect to be taxed like a C corporation. Therefore, like a C corporation, the L.L.C.'s income would be taxed at both the L.L.C. level and at the member-owner level when the L.L.C. distributes its income as a dividend to its members (Treas. Reg. §§ 301.7701-1 to -3).

Partnerships

A partnership is an association formed under state law by two or more individuals, corporations, or other entities to carry on a trade or business with each contributing cash and/or property in exchange for an ownership interest in the partnership and a share of the partnership's income and losses based on the percentage of their partnership interest (26 U.S. Code §§ 761(a), (b), and (c); Treas. Reg. §§ 301.7701-2(a) and (c); U.P.A. §§ 201(a) and 202(a)).

There is no limit as to the number of partners in a partnership and partners can be U.S. citizens or residents, foreign individuals, domestic and foreign corporations, other partnerships, L.L.C.s, and other organizations. There are two types of partners, general partners and limited partners. Usually, general partners, not limited partners, participate in managing the partnership.

Because general partners have unlimited personal liability for the partnership's debts, obligations, and other liabilities, claims can be filed against both the partnership's assets and the general partners' own assets. Unlike general partners, limited partners have limited liability protection, but if they are held liable for a partnership's debts and obligations, their liability is limited to the amount they invested in the partnership (Treas. Reg. § 301.7701-3(b)(2)(ii)).

There are also several different types of partnerships. In a general partnership, there are only general partners, who are all jointly and severally liable for the partnership's debts, obligations, and liabilities. In a limited partnership, there is at least one general partner and one limited partner. In a limited liability partnership, the partnership, not the partners, are solely responsible for its debts, obligations, and other liabilities and the partners are liable for their own malpractice, but not for other partners' own malpractice (U.P.A. § 306(a)).

General and limited individual partners pay self-employment, but not F.U.T.A. taxes, on amounts they receive for providing services to a partnership. General partners also pay self-employment taxes on their distributive share of a partnership's income. But, limited partners do not pay self-employment taxes on their distributive share, except to the extent that their share is a guaranteed payment, which is an amount paid to limited partners for providing services to the partnership without regard to their partnership interest. (26 U.S. Code §§ 1401 and 1402(a)(13)).

Limited Liability Companies

A limited liability company is a business entity organized under state law and is formed by investors, who become members of the L.L.C., contributing cash and/or property in exchange for a share in the L.L.C. and the right to a percentage of the L.L.C.'s profits and losses. An L.L.C. can have one member or an unlimited number of members and members can be U.S. citizens, U.S. residents or foreign individuals, domestic and foreign corporations, partnerships, other L.L.C.s, and other entities, except certain banks and insurance companies. (e.g., California L.L.C. Act §§ 17701.02(k), 17701.04, and 17701.05). An L.L.C. can have member classes with different rights, such as one member class having more decision making rights than another member class.

An L.L.C. is a hybrid entity because it has partnership and corporate characteristics. Like a partnership, an L.L.C.'s income, losses, deductions, and credits pass through to its members, who report their share of the L.L.C.'s income and pay any taxes due on the income at their own tax rate. As with corporations, L.L.C. members have limited liability protection, but if they are held liable for an L.L.C.'s debts and obligations, their liability is limited to the amount they invested in the L.L.C.

L.L.C. members pay self-employment, but not F.U.T.A. taxes on both the amounts they receive for providing services to the L.L.C. and on their distributive share of the L.L.C.'s income. (I.R.S. Private Letter Ruling 9432018).

S corporations

An S corporation is a small business entity that is formed as a C corporation under state law, but for federal income tax purposes, elects to be taxed like a partnership. (26 U.S. Code §§ 1361(a) and (b)). An S corporation is a hybrid entity, because like a C corporation, the S corporation's shareholders, board of directors, and officers have limited liability protection and like a partnership, its income is taxed only at the shareholder level. If S corporation shareholders are held

responsible for the S corporation's debts and liabilities, their liability is limited to the amount of their investment in the S corporation.

An S corporation cannot issue more than one class of stock, be a foreign corporation, or a subsidiary of a C or S corporation. An S corporation generally can have only 100 shareholders, who must all be U.S. citizens, U.S. residents, or domestic trusts, estates, or tax-exempt organizations. However, the number of shareholders can exceed 100 without jeopardizing the S corporation's tax status, because for federal tax purposes, certain S corporation shareholders, who are related to each other, such as a father and his daughter, are treated as one shareholder.

In certain circumstances, such as an S corporation issuing a second class of stock, an S corporation can involuntarily lose its S corporation tax status, resulting in it being taxed as a C corporation, rather than as a partnership. Except in certain situations, such as the termination of its S corporation status was not within its control, an S corporation that loses its tax status must wait five years before re-electing to be taxed like a partnership. (26 U.S. Code §§ 1361(a) and (b), 1362(a) and 1363(a) and (b)).

Like C corporation shareholders, S corporation shareholders pay F.I.C.A. and F.U.T.A. taxes on distributions for providing services to the S corporation, but not on their distributive share of the S corporation's earnings profits, whereas general partners pay self-employment taxes on both distributions for providing services to the partnership and their distributive share of the partnership's income. Also, similarly to C corporations, the Internal Revenue Code (I.R.S.) could determine that an S shareholder was not reasonably compensated for their services or may classify a shareholder's distribution as wages subject to income and employment taxes. (*Joseph Radtke, S.C. v. United States*, 1990; I.R.S. Rev. Rul. 59-221 and I.R.S. Rev. Rul. 74-44).

Choice of Entity Example

Betty knows that choosing the form of business entity for her startup business, Pelican Publishing (Pelican), is one of her most important business decisions. Because she does not know what would be the best business structure for Pelican, she is seeking advice about choosing a business entity. Betty is concerned about employment taxes and being personally liable for Pelican's debts and would like to have complete control over Pelican's management and avoid double taxation on its income.

If Pelican is a sole proprietorship, Betty would be in control of Pelican and would avoid double taxation, but she would be personally liable for Pelican's debts. For federal income tax purposes, as a sole proprietorship, an amount equal to the lesser of 20 percent of Betty's taxable income or 20 percent of Pelican's Q.B.I. could be deducted from Pelican's taxable income, thus reducing the amount of Pelican's Q.B.I. subject to tax by 20 percent. As a single shareholder C corporation, Betty would be in control of Pelican and not personally liable for Pelican's debts. However, Pelican's income would be taxed twice, first at the entity level, then at the shareholder level when Pelican distributes its income to Betty as a dividend.

Although Betty generally would have limited liability protection, in certain circumstances, such as Pelican is found to be a sham corporation, the corporate veil could be pierced and Betty would become personally liable for Pelican's debts up to the amount of her investment in Pelican.

For Pelican to be a partnership, Betty would have to partner with at least one other individual, corporation, or entity, because a partnership must have at least two partners. As a general partner,

Betty could manage Pelican's daily operations, but she would be personally liable for Pelican's debts. As a partnership, Pelican's income would not be taxed twice, but in contrast to a sole proprietorship or a single shareholder C corporation, its income would be divided between Betty and the other partners.

If Pelican is either a single member L.L.C. or a single shareholder S corporation, Betty would be in control of Pelican, would avoid double taxation, and except in certain circumstances, she would not be personally liable for Pelican's debts. Also, as pass-through entities, a 20 percent pass-through entity deduction could be claimed, thus reducing the amount of Pelican's Q.B.I. subject to tax by 20 percent.

However, because of the limits on the number of S corporation shareholders and who can be S corporation shareholders, it could be more difficult for Pelican to grow as an S corporation, than as an L.L.C., and therefore, an L.L.C. may be a better entity choice. For example, if Pelican is an L.L.C., instead of an S corporation, the number of members could exceed 100 and the members could be foreign individuals and both domestic and foreign C corporations, rather than only U.S. citizens and residents, domestic trusts, estates, or tax-exempt organizations.

Although Betty wants to avoid double taxation, with the current 21 percent flat federal corporate income tax rate, for federal tax purposes, a C corporation, rather than a sole proprietorship or a pass-through entity, could be a better entity choice for Pelican. For example, if Pelican is a C corporation with \$1,000 of taxable income, it would pay \$210 of taxes on the \$1,000 ($\$1,000 \times 21\% = \210). If Betty's federal dividend tax rate is the lowest current rate of zero percent and she receives a \$790 dividend from Pelican ($\$1,000$ taxable income - \$210 taxes paid by Pelican = \$790 dividend), she would not pay taxes on the dividend.

If instead Pelican is a single member L.L.C. and Betty's federal income tax rate is the current highest rate of 37 percent, Pelican would not pay taxes on its taxable income of \$1,000 and Betty would pay \$370 of taxes on it ($\$1,000 \times 37\% = \370). Therefore, for tax purposes, a C corporation would be a better structure for Pelican, because the total amount of taxes paid on its taxable income would be less than if it was an L.L.C.

However, if Betty's federal income tax rate is lower than her dividend tax rate, a sole proprietorship or a pass-through entity would be a better option for tax purposes, because the total amount of taxes paid on Pelican's taxable income would be less than if Pelican was a C corporation. For example, if Pelican is a single member L.L.C. with taxable income of \$1,000 and Betty's individual tax rate is the lowest current rate of 10 percent, Pelican would not pay taxes on the \$1,000 and Betty would pay \$100 in taxes on it ($\$1,000 \times 10\% = \100).

If Pelican instead is a C corporation and distributes a \$790 dividend ($\$1,000$ taxable income - \$210 taxes paid by Pelican = \$790 dividend) to Betty and her dividend tax rate is the highest current rate of 20 percent, Pelican would pay \$210 of taxes on its taxable income ($\$1,000 \times 21\% = \210) and Betty would pay \$158 on her dividend ($\$790 \times 20\% = \158). Thus, an L.L.C., rather than a C corporation, would be a better structure for tax purposes, because less taxes would be paid on Pelican's \$1,000 of taxable income.

If Pelican is a sole proprietorship, Betty would pay self-employment, but not F.U.T.A. taxes on Pelican's income. If Pelican is a partnership, as a general or limited partner, Betty's compensation for her services to Pelican would be subject to self-employment taxes, but not F.U.T.A. If Betty was a limited, not general partner, her distributive share of Pelican's income would be exempt from self-employment taxes except to the extent her share was a guaranteed payment. As an L.L.C., Betty would pay self-employment, but not F.U.T.A. taxes on her share of Pelican's income and on compensation for her services to Pelican.

If Pelican is a C or S corporation, neither Pelican nor Betty would pay employment taxes on Betty's share of Pelican's earnings and profits, but distributions to Betty for providing services to Pelican would be subject to F.I.C.A and F.U.T.A. Also, the I.R.S. could question whether Betty was reasonably compensated for her services to Pelican or classify distributions to her as wages subject to income and employment taxes.

Conclusion

As discussed and illustrated above, what business entity the owners of a startup business choose will determine the tax and non-tax consequences for both the owners and the startup. However, by understanding the similarities, differences, advantages, and disadvantages of different business entities, owners can choose the best business structure for their startup business.

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THE IMPLICATIONS OF ACCOUNTING VARIABLES ON FUTURE PROFITABILITY AND THE VALUATION OF STARTUP COMPANIES

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SUMMARY: This paper examines the accounting and financial aspects of startup companies. Because startup companies have shorter histories of past performance, both managers and investors face more uncertainty regarding future profitability and growth potential. For this study, we collect data from U.S. firms for 1991-2015 to determine whether firms in their early stages report different financial characteristics than those reported by mature firms. Test results show that current cash flows from operating activities are less persistent in the prediction of one-year-ahead earnings for early-stage firms than for mature firms. The firm's financing capacity is more positively associated with future earnings for early-stage firms. From the stock price-to-book value of the equity ratio, we find that research and development expenses are valued less for early-stage firms. The findings of this paper suggest that the managers of startup companies need to consider such differences in their planning for future operations.

Introduction

Startup companies operate in unique situations that involve more uncertainty about future growth, cash flows, and market valuations than firms operating in mature stages. Such unique situations affect how accounting variables are interpreted to predict future earnings for startup companies. The motivation of this paper is to identify a set of accounting variables that show different characteristics in different stages and to examine how such variables affect future earnings and firm valuation for startup companies. A sample of U.S. firms for the period of 1991 to 2015 was selected from the COMPUSTAT annual data. As a proxy to represent startup companies, we identify early-stage firms and compare such firms with nonearly-stage firms based on the IPO age. Test models are constructed to compare the relative coefficients of accounting variables in the prediction of one-year-ahead earnings. The implications of accounting variables for firm valuation are tested using the price-to-book (PB) ratios of the firms. The price-to-book ratio captures the implications of accounting variables not yet reflected in the current book value

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of equity. A high PB ratio may indicate that investors assign more value to the future expected cash flows of the firm.

We find that accounting variables show different financial characteristics for early-stage and nonearly-stage companies. The test results also show that stock market investors place varying emphases on the accounting variables of early-stage companies than those of nonearly-stage companies. The remainder of this paper is organized as follows. Section 2 reviews prior research and develops research questions for this work. Test models and sample selection are presented in sections 3 and 4. Section 5 reports descriptive statistics for the sample. The regression results are provided in section 6. Section 7 presents conclusions and suggestions to the managers and investors of startup companies.

Literature Review and Research Questions

Prior research on startup companies addresses various factors that affect the success of startup businesses. Gelderen et al. (2006) examine the factors that shape the success of a business in the pre-startup phase. Sommer et al. (2009) present evidence on how startup companies manage uncertainty. Another area of research on startup companies focuses on the impacts of venture capital on the success of startup companies (Hellmann and Puri, 2002; Davila et al., 2003; Ivanov and Xie, 2010). Cassar (2009) reports that the importance of the cash flow statement varies in different stages of development. Archibald et al. (2002) find that startup and established companies apply different criteria to their operating decisions.

Prior research in accounting reports that the roles of accounting variables in the prediction of future profitability vary at different stages of the life cycle of a firm (Oskouel and Zadeh, 2017). Jenkins and Kane (2004) examine the value relevance of accounting variables and find a higher level of valuation emphasis placed on the growth of a firm in earlier life cycle stages. In the management accounting research literature, it is reported that the characteristics of a firm affect the adoption of management accounting systems (Granlund and Taipaleenmaki, 2005; Davila and Foster, 2005, 2007).

Differential roles of the cash flow and accrual components in the prediction of future earnings have been previously reported (Sloan, 1996; Richardson et al., 2005; Hewitt, 2009). Dichev and Tang (2008) report that earnings persistence declines as the volatility of earnings increases. Call et al. (2015) show that using firm-specific estimates of earnings persistence provides incremental information for forecasting and valuation. Using the book-to-market ratio, Lev and Sougiannis (1999) show that research and development (R&D) capital provides value-relevant information to stock investors. Beaver and Ryan (2000) show how book-to-market ratios are associated with future book returns on equity. Nezlobin et al. (2016) find that the price-to-book (PB) ratio and the price-to-earnings (PE) ratio are affected by various factors, such as anticipated future growth and economic profitability.

To examine whether accounting variables have different implications for future earnings and firm valuations for startup companies, we address the following research questions: (1) are accounting variables generally different for firms in an early business stage after IPO than for firms in a more mature stage? (2) do the accounting measures exhibit different abilities to predict future earnings for firms in an early business stage after IPO than for firms in a more mature stage? (3) finally, do accounting variables have different valuation implications for firms in an early business stage after IPO than for firms in a more mature stage?

Test Models

To examine our first research question, we compare descriptive statistics for several accounting measures across the early-stage and nonearly-stage subsamples. The results are presented in Table 1. To examine our second research question, we first apply Model 1 to the early-stage and nonearly-stage subsamples separately (the coefficients are reported in Table 3 Columns 1 and 2); then, we use Model 2 to examine differences in coefficients across these two subsamples:

Model 1: Prediction of one-year-ahead earnings

$$ROA_{t+1} = \beta_0 + \beta_1 ROA_t + \beta_2 CFOA_t + \beta_3 CFFOA_t + \beta_4 REVOA_t + \beta_5 TLTA_t + \beta_6 RNDOA_t + \varepsilon_{t+1}$$

where,

Return-on-asset ratio (ROA) is net income divided by average total assets for the current period.

Asset turnover ratio (REVOA) is the total revenue divided by average total assets.

R&D expenditure level (RNDOA) is the Research and Development (R&D) expenses divided by average total assets for the current period.

Leverage level (TLTA) is total liabilities divided by total assets.

We also include two cash flow ratios: **CFOA**, which equals cash flow from operating activities divided by average total assets; and **CFFOA**, which equals cash flow from financing activities divided by average total assets.

Model 2: Regression model to test whether two age groups (early-stage and nonearly-stage) report different coefficients

$$ROA_{t+1} = \beta_0 + \beta_1 EarlyStage + \beta_2 ROA_t + \beta_3 ROA_t * EarlyStage + \beta_4 CFOA_t + \beta_5 CFOA_t * EarlyStage + \beta_6 CFFOA_t + \beta_7 CFFOA_t * EarlyStage + \beta_8 REVOA_t + \beta_9 REVOA_t * EarlyStage + \beta_{10} TLTA_t + \beta_{11} TLTA_t * EarlyStage + \beta_{12} RNDOA_t + \beta_{13} RNDOA_t * EarlyStage + \varepsilon_{t+1}$$

where,

Early-stage indicator (EarlyStage) is equal to 1 when a firm's IPO_AGE is less than or equal to two, and equal to 0 otherwise. IPO_AGE is calculated as the number of fiscal years that have passed since the IPO year. IPO_AGE is zero when the current fiscal year is the IPO year. IPO_AGE is one when the current fiscal year is the first year following the IPO year.

All other variables are as defined above. Model 2 is estimated for early-stage and nonearly-stage subsamples combined. Coefficients on the interaction terms are reported in Table 3 Column 3.

To examine our third research question, we first separately apply Model 3 to the early-stage and nonearly-stage subsamples (the coefficients are reported in Table 4 Columns 1 and 2); then, we use Model 4 to examine differences in the coefficients between these two subsamples:

Model 3: Price-to-book (PB) ratio as a dependent variable

$$PB_t = \beta_0 + \beta_1 ROA_t + \beta_2 CFOA_t + \beta_3 CFFOA_t + \beta_4 REVOA_t + \beta_5 TLTA_t + \beta_6 RNDOA_t + \varepsilon_t$$

where, **Price-to-book (PB) ratio** is the stock price per share divided by the book value per share. All other variables are as defined above.

Model 4: Regression model to test whether two age groups (early-stage and nonearly-stage) report different coefficients

$$PB_t = \beta_0 + \beta_1 \text{EarlyStage} + \beta_2 ROA_t + \beta_3 ROA_t * \text{EarlyStage} + \beta_4 CFOA_t + \beta_5 CFOA_t * \text{EarlyStage} + \beta_6 CFFOA_t + \beta_7 CFFOA_t * \text{EarlyStage} + \beta_8 REVOA_t + \beta_9 REVOA_t * \text{EarlyStage} + \beta_{10} TLTA_t + \beta_{11} TLTA_t * \text{EarlyStage} + \beta_{12} RNDOA_t + \beta_{13} RNDOA_t * \text{EarlyStage} + \varepsilon_t$$

All other variables are as defined above. Model 4 is estimated for the early-stage and nonearly-stage subsamples combined. The coefficients on the interaction terms are reported in Table 4 Column 3.

Sample Selection

The COMPUSTAT North America Fundamentals Annual data is provided by Wharton Research Data Services (WRDS, <https://wrds-web.wharton.upenn.edu/wrds/>). This data was used to select the sample companies for the fiscal years of 1991 to 2015. Companies with an ISO Country Code of Incorporation of USA and a Currency Code of USD were selected. The IPO age of a firm is calculated as 0 when the COMPUSTAT Company Initial Public Offering date falls within the fiscal year. IPO age is coded as 1 for the following fiscal year. IPO age n refers to the fiscal period, which is n years after the IPO year. For certain companies, COMPUSTAT reports data for fiscal years preceding the IPO year. Fiscal years preceding the IPO year are excluded from the sample.

For fiscal years 1991 to 2015, 71,741 firm-years are included in the sample. From this sample, extreme values for each variable are defined as less than the 1st percentile or as greater than the 99th percentile. For statistical analyses, we transformed extreme values as missing values. In the calculation of the price-to-book (PB) ratio, which is defined as the stock price per share divided by the book value per share, when the book value of equity is zero or negative, it is difficult to interpret implications of the PB ratio. Therefore, additional requirements were imposed on sample selection by excluding firm-years reporting a zero or negative PB ratio. In the final sample, 63,177 firm-years reported positive PB ratios.

We divided the sample into two sub-samples: an early-stage subsample and nonearly-stage subsample. The early-stage subsample includes firm-years with IPO age from 0 to 2 (i.e., 3 years including the IPO years). Nonearly-stage subsample includes firm-years with IPO ages of equal to or greater than 3. In the regression analyses, we require that no accounting variables are missing from the regression model.

Descriptive Statistics

To answer our first research question, we compare accounting variables of the early-stage and nonearly-stage subsamples. Table 1 presents descriptive statistics for all accounting variables of interest for the IPO sample companies in their early-stage (Table 1 Column 1) and their nonearly-stage (Table 1 Column 2). Table 1 Column 3 compares the means of all accounting variables of interest for the early-stage and nonearly-stage subsamples.

Table 1

Summary Statistics

| Accounting Variables | (1) Early-stage | | | (2) Nonearly-stage | | | (3) Diff. in Mean | |
|----------------------|--------------------|--------|-------|-----------------------|--------|--------|----------------------|---------|
| | N | Mean | SD | N | Mean | SD | Diff. | P-value |
| PB | 17,607 | 4.017 | 4.695 | 45,570 | 3.252 | 4.259 | 0.765 | <.0001 |
| ROA | 14,565 | -0.114 | 0.342 | 44,196 | -0.051 | 0.2616 | -0.063 | <.0001 |
| CFOA | 14,101 | -0.053 | 0.264 | 43,070 | 0.016 | 0.2073 | -0.069 | <.0001 |
| CFFOA | 14,110 | 0.302 | 0.471 | 43,017 | 0.074 | 0.2545 | 0.228 | <.0001 |
| REVOA | 14,486 | 0.914 | 0.837 | 44,264 | 0.949 | 0.8211 | -0.036 | <.0001 |
| TLTA | 17,335 | 0.433 | 0.258 | 45,004 | 0.500 | 0.2507 | -0.067 | <.0001 |
| RNDOA | 8,521 | 0.138 | 0.166 | 25,527 | 0.101 | 0.1443 | 0.037 | <.0001 |

Note. Table 1 separately presents the number of nonmissing values (N) and the means and standard deviations (SD) of all accounting variables of interest for the two subsamples (Column 1: Early-stage subsample, Column 2: Nonearly-stage subsample). Column 3 presents differences in means observed between the Early-stage and Nonearly-stage subsamples and the t-test p-value for the significance of differences.

Table 1 shows that early-stage companies generally report lower levels of profitability (i.e., smaller *ROA*) than do their nonearly-stage counterparts. Consistently, early-stage companies tend to generate more cash flow from financing activities (*CFFOA*) than from operating activities (*CFOA*). However, mature companies report higher leverage levels. As one possible explanation, as profitability levels are generally low in early business stages, companies mainly finance by issuing shares rather than by borrowing money from banks. We also find that early-stage companies tend to have more Research and Development expenditures (*RNDOA*) than their nonearly-stage counterparts, which is consistent with higher R&D intensity levels observed in earlier stages (Park, 2017; Lev and Sougiannis, 1999). Price-to-book (*PB*) ratio is generally higher in the companies' early years than in their later stages

We find that the mean *ROA* is negative for our sample. According to the prior literature, negative and positive earnings may have different implications for future earnings and market prices (e.g., Collins, Pincus and Xie, 1999; Brown, 2001; Barnhart and Giannetti, 2009; Dorminey, Sivakumar and Vijayakumar, 2018; Hayn, 1995; Hu, Ke and Yu, 2018; Joos and Plesko, 2005; Klein and Marquardt, 2006; Pinello, 2008; Sadka and Sadka, 2009). Thus, we first estimate regression Models 1-4 without restrictions on *ROA* and then with a restriction of $ROA_t > 0$ to focus on positive-earnings firms.

Table 2 presents correlation coefficients for the early-stage subsample in Panel 1 and for the nonearly-stage subsample in Panel 2. Overall, we find that almost all accounting variables are correlated with one-year-ahead *ROA* and *PB* ratios with only one exception: for the early-stage subsample, the leverage levels are not correlated with *PB* ratios. We mainly rely on the regression results of Models 1-4 to analyze the association between *ROA* (*PB*) and the accounting variables of interest.

Table 2

Correlation Table

| Panel 1. Pearson Correlation for the Early-stage Subsample | | | | | | | |
|--|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | PB_t | ROA_{t+1} | ROA_t | $CFOA_t$ | $CFFOA_t$ | $REVOA_t$ | $TLTA_t$ |
| PB_t | 1.00 | | | | | | |
| ROA_{t+1} | -0.18 | 1.00 | | | | | |
| ROA_t | -0.20 | 0.70 | 1.00 | | | | |
| $CFOA_t$ | -0.15 | 0.67 | 0.78 | 1.00 | | | |
| $CFFOA_t$ | 0.19 | -0.32 | -0.38 | -0.47 | 1.00 | | |
| $REVOA_t$ | 0.04 | 0.28 | 0.31 | 0.29 | -0.21 | 1.00 | |
| $TLTA_t$ | 0.00 | 0.20 | 0.13 | 0.16 | -0.27 | 0.05 | 1.00 |
| $RNDOA_t$ | 0.20 | -0.44 | -0.54 | -0.54 | 0.33 | -0.33 | -0.24 |

| Panel 2. Pearson Correlation for the Nonearly-stage Subsample | | | | | | | |
|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | PB_t | ROA_{t+1} | ROA_t | $CFOA_t$ | $CFFOA_t$ | $REVOA_t$ | $TLTA_t$ |
| PB_t | 1.00 | | | | | | |
| ROA_{t+1} | -0.23 | 1.00 | | | | | |
| ROA_t | -0.27 | 0.71 | 1.00 | | | | |
| $CFOA_t$ | -0.23 | 0.69 | 0.79 | 1.00 | | | |
| $CFFOA_t$ | 0.28 | -0.43 | -0.51 | -0.58 | 1.00 | | |
| $REVOA_t$ | 0.02 | 0.19 | 0.22 | 0.26 | -0.19 | 1.00 | |
| $TLTA_t$ | 0.02 | 0.12 | 0.07 | 0.06 | -0.08 | -0.06 | 1.00 |
| $RNDOA_t$ | 0.31 | -0.48 | -0.56 | -0.59 | 0.42 | -0.26 | -0.21 |

Note. Table 2 presents Pearson correlations for the early-stage subsample in Panel 1 and for the Nonearly-stage subsample in Panel 2. Significant correlation coefficients are bolded at the 0.05 level. All dependent and independent variables used for the regression analyses are included in Panels 1 and 2.

Regression Results

Table 3 presents regression results on the predictability of accounting measures to future earnings (i.e., ROA_{t+1}). The regression was separately estimated for the early-stage and nonearly-stage subsamples. Column 1 presents estimations of coefficients and t-statistics for the early-stage subsample, in which we include data for 2 years after an IPO and for the year of an IPO. Column 2 presents our estimation of coefficients and t-statistics for the nonearly-stage subsample, in which we include all available years beyond the second fiscal year after a firm's IPO. Column 3 presents the difference in coefficient estimations observed between the two subsamples and the t-test p-

value of their significance level.*† We first present regression results without any restrictions on ROA_t in Table 3 Panel 1; we then present regression results with the $ROA_t > 0$ restriction in Table 3 Panel 2. We can see that for our early-stage subsample, only about 46% of firm-years have positive earnings. For our nonearly-stage subsample, about 56% of firm-years have positive earnings.

The results presented in Table 3 Panel 1 demonstrate that, in general, ROA_t positively predicts future earnings, and the level of predictability is not significantly different across early-stage and nonearly-stage subsamples. The asset turnover ratio ($REVOA_t$) is more positively associated with future earnings for early-stage firms than for nonearly-stage firms. As one possible explanation, in early stages, the ability to generate revenue reflects the ability of a company to survive, which is crucial to an early-stage company. Cash flows from both operating ($CFOA_t$) and financing activities ($CFFOA_t$) predict future earnings. The predictability of $CFOA_t$ is stronger for nonearly-stage companies, while that of $CFFOA_t$ is stronger for early-stage companies. These results are consistent with the fact that early-stage companies do not usually have an ability to generate large sums of cash through operating activities, while cash flows from financing activities may help them succeed in business. We also find that the leverage ratio is positively associated with future earnings while predictability levels are higher for early-stage firms than for nonearly-stage firms, suggesting that the capacity of early-stage companies to borrow money is an important predictor of their future profitability. We find that R&D expenses ($RNDOA_t$) do not positively predict future earnings, suggesting that investors should not rely too heavily on this variable in predicting one-year-ahead earnings.

We re-estimate the regression with $ROA_t > 0$ as a restriction, and we present the results in Table 3 Panel 2. The results suggest that when focusing on profitable companies, cash flows from financing activities no longer positively predict one-year-ahead earnings. We also find that for profitable early-stage firms, the predictability of ROA_t is stronger than it is for nonearly-stage firms.

Table 3

The Predictability of Accounting Variables to Future Earnings

| Panel 1. The Predictability of Accounting Variables to Future Earnings without ROA_t Restriction | | | | | | |
|--|--------------------|---------|-----------------------|---------|------------------------|---------|
| Variables | (1) Early-stage | | (2) Nonearly-stage | | (3) Diff. in Coeff. | |
| | Coeff. | T-stat. | Coeff. | T-stat. | Diff. | P-value |
| ROA_t | 0.42*** | 27.30 | 0.43*** | 48.79 | -0.01 | 0.376 |
| $CFOA_t$ | 0.51*** | 26.20 | 0.58*** | 49.91 | -0.07*** | 0.000 |
| $CFFOA_t$ | 0.04*** | 5.90 | 0.02*** | 3.45 | 0.02** | 0.040 |
| $REVOA_t$ | 0.03*** | 7.59 | 0.01*** | 2.75 | 0.03*** | <.0001 |
| $TLTA_t$ | 0.11*** | 7.35 | 0.06*** | 9.14 | 0.05*** | 0.001 |

* The t-test statistics are generated from interaction terms in a regression analysis of the whole sample (i.e., Model 2).

† The untabulated robustness test suggests that including year or industry-fixed effects does not significantly affect our results. Our regression results are also robust to different standard error adjustments.

| | | | | | | |
|---------------------|----------|--------|----------|--------|-------|-------|
| $RNDOA_t$ | -0.06*** | -2.79 | -0.07*** | -5.42 | -0.00 | 0.848 |
| Intercept | -0.15*** | -19.22 | -0.09*** | -22.52 | | |
| N | 8,127 | | 24,287 | | | |
| Adj. R ² | 0.54 | | 0.58 | | | |

Panel 2. The Predictability of Accounting Variables to Future Earnings with $ROA_t > 0$ Restriction

| Variables | (1) Early-stage | | (2) Nonearly-stage | | (3) Diff. in Coeff. | |
|---------------------|--------------------|---------|-----------------------|---------|------------------------|---------|
| | Coeff. | T-stat. | Coeff. | T-stat. | Diff. | P-value |
| ROA_t | 0.57*** | 15.15 | 0.34*** | 18.24 | 0.23*** | <.0001 |
| $CFOA_t$ | 0.26*** | 13.39 | 0.39*** | 34.31 | -0.14*** | <.0001 |
| $CFFOA_t$ | -0.01* | -1.81 | -0.03*** | -4.02 | 0.01 | 0.134 |
| $REVOA_t$ | 0.00 | -0.11 | 0.00 | -1.12 | 0.00 | 0.699 |
| $TLTA_t$ | 0.03** | 2.26 | 0.00 | -0.93 | 0.03*** | 0.008 |
| $RNDOA_t$ | -0.28*** | -9.96 | -0.30*** | -19.9 | 0.02 | 0.523 |
| Intercept | -0.03*** | -4.27 | -0.01** | -2.17 | | |
| N | 3,743 | | 13,681 | | | |
| Adj. R ² | 0.16 | | 0.18 | | | |

Note. Table 3 presents regression results on the predictability of accounting variables to future earnings without ROA_t restriction (Panel 1) and with $ROA_t > 0$ restriction (Panel 2). The dependent variable is the one-year-ahead return on assets (ROA_{t+1}). Column 1 presents the estimations of coefficients and t -statistics for the Early-stage subsample, in which we include data for 2 years after an IPO and for the year of an IPO. Column 2 presents the estimation of coefficients and t -statistics for the Nonearly-stage subsample, in which we include all available years following the second fiscal year after a firm's IPO. ***, **, * indicate variables significant at the 0.01, 0.05 and 0.1 levels, using two-sided t -test. Column 3 presents the difference in coefficient estimations observed across the two subsamples and the t -test p -value of their significance level from Model 2.

Table 4 presents regression results on the market valuation of accounting variables of interest. The dependent variable is the current year PB ratio. Without any restrictions on ROA_t we find that ROA_t is negatively associated with PB_t (Table 4 Panel 1). Thus, we re-estimate Models 3 and 4 with the restriction that $ROA_t > 0$, and we present the results in Table 4 Panel 2. When $ROA_t > 0$, ROA_t is positively associated to PB_t , which is consistent with the prior valuation literature (i.e., Beaver and Ryan, 2000; Feltham and Ohlson, 1995; Olson, 1995). We also find that $REVOA_t$ is only priced by the market when there is a loss and is not priced when net income is positive. Interestingly, even though Research and Development expenses do not predict one-year-ahead earnings, they are priced by the market, suggesting that the valuation market recognizes the potential long-term benefits of Research and Development expenditures.

From Table 4 Panel 2, we find that the market prices of all accounting variables are similar across profitable early-stage and nonearly-stage firms, while the results given in Table 3 suggest that the predictability of ROA_t , $CFOA_t$, and $TLTA_t$ for future earnings significantly varies between early-stage and nonearly-stage firms. These results suggest that investors may overlook differences in the implications of financial variables for early-stage and nonearly-stage firms.

Table 4

The Valuation of Accounting Variables

Panel 1. The Valuation of Accounting Variables without ROA_t Restriction

| Variables | (1) Early-stage | | (2) Nonearly-stage | | (3) Diff. in Coeff. | |
|------------|--------------------|---------|-----------------------|---------|------------------------|---------|
| | Coeff. | T-stat. | Coeff. | T-stat. | Diff. | P-value |
| ROA_t | -0.99*** | -3.74 | -1.80*** | -10.66 | 0.81*** | 0.007 |
| $CFOA_t$ | 1.24*** | 3.66 | 1.88*** | 8.44 | -0.64* | 0.095 |
| $CFFOA_t$ | 1.97*** | 17.16 | 3.27*** | 27.91 | -1.29*** | <.0001 |
| $REVOA_t$ | 0.28*** | 3.59 | 0.20*** | 5.38 | 0.07 | 0.374 |
| $TLTA_t$ | 4.52*** | 17.99 | 4.23*** | 33.96 | 0.30 | 0.258 |
| $RNDOA_t$ | 5.85*** | 14.68 | 8.67*** | 36.11 | -2.83*** | <.0001 |
| Intercept | 1.03*** | 7.32 | 0.45*** | 6.09 | | |
| N | 8,175 | | 24,474 | | | |
| $Adj. R^2$ | 0.10 | | 0.18 | | | |

Panel 2. The Valuation of Accounting Variables with $ROA_t > 0$ Restriction

| Variables | (1) Early-stage | | (2) Nonearly-stage | | (3) Diff. in Coeff. | |
|------------|--------------------|---------|-----------------------|---------|------------------------|---------|
| | Coeff. | T-stat. | Coeff. | T-stat. | Diff. | P-value |
| ROA_t | 15.81*** | 15.08 | 16.63*** | 35.21 | -0.82 | 0.421 |
| $CFOA_t$ | 4.82*** | 9.02 | 5.55*** | 19.16 | -0.72 | 0.185 |
| $CFFOA_t$ | 1.80*** | 9.27 | 2.21*** | 13.09 | -0.41* | 0.091 |
| $REVOA_t$ | -0.05 | -0.58 | -0.01 | -0.24 | -0.04 | 0.613 |
| $TLTA_t$ | 5.24*** | 16.54 | 5.13*** | 39.18 | 0.11 | 0.709 |
| $RNDOA_t$ | 10.86*** | 13.92 | 11.88*** | 31.25 | -1.02 | 0.186 |
| Intercept | -0.83*** | -3.96 | -1.44*** | -16.46 | | |
| N | 3,763 | | 13,763 | | | |
| $Adj. R^2$ | 0.18 | | 0.23 | | | |

Note. Table 4 presents regression results on the valuation of accounting variables without ROA_t restriction (Panel 1) and with $ROA_t > 0$ restriction (Panel 2). The dependent variable is the current year price-to-book ratio (PB_t). Column 1 presents estimations of coefficients and t -statistics for the Early-stage subsample, in which we include data for 2 years following an IPO and for the year of an IPO. Column 2 presents the estimation of coefficients and t -statistics for the Nonearly-stage subsample, in which we include all years following the second fiscal year after a firm's IPO. ***, **, * indicate variables significant at the 0.01, 0.05 and 0.1 levels, using two-sided t -test. Column 3 presents the difference in coefficient estimations between the two subsamples and the t -test p -value of their significance level in Model 4.

In this paper we use IPO age as a proxy to identify early-stage companies. Firm-years with IPO ages of 0, 1 and 2 were selected to measure early-stage companies. Due to data availability limitations, test results provided in this paper are based on the number of years since the IPO and

not on the number of years of operation. Compared to mature-stage firms, we believe that early-stage firms share some financial characteristics with startup companies. To determine whether the test results are sensitive to the increase in IPOs occurring among tech industry companies in the late 1990s and early 2000s, we identified high-tech industries based on the SIC code classifications used by Chen, DeFond and Park (2002). Test results for the high-tech industry and for other industries still show that the implications of accounting variables are different for early-stage and nonearly-stage firms.

Conclusions and Suggestions

Based on our analyses of U.S. firms for 1991 to 2015, we find that early-stage firms after an IPO present different financial characteristics from those of mature firms. The implications of accounting variables for the prediction of one-year-ahead earnings and for firm valuation are also different for early-stage and nonearly-stage firms. Based on these findings, it is suggested that the managers and investors of startup companies not overlook the fact that financial characteristics of startup companies are different from those of mature companies. More specifically, we make following suggestions to the investors and managers of startup firms based on the results of this paper.

Suggestions to Investors

- (1) Accounting variables are significantly different between new startup companies and more mature companies.
- (2) The predictability of accounting variables for future earnings also differs between startup and mature companies. Investors should consider these differences in their investment decisions.

Suggestions to Managers

- (1) Investors treat gain and loss companies differently.
- (2) Asset turnover ratio and cash flow from financing activities are more important for startup companies to succeed than they are for mature companies.
- (3) Even though Research and Development expenses do not provide a short-term benefit, they are priced by the market, suggesting that the valuation market recognizes the potential long-term benefits of Research and Development activities.

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BOOK REVIEW

THE MODEL THINKER: WHAT YOU NEED TO KNOW TO MAKE DATA WORK FOR YOU BY SCOTT E. PAGE, PH.D.

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The understanding of and ability to use models is important for researchers, academics, economists, and others. It is especially important for people in business to understand and be able to use models; but people in business often don't have the background in model building that people in the academic and scientific disciplines have.

In *The Model Thinker* (2018), Scott Page, Ph.D. provides a detailed treatise on the background, use of, and building of a wide variety of mathematical, statistical, and computational models. The models covered include game theory, random walks, linear regression, and many more. For the most part, Dr. Page explains the models in non-mathematical terms. This should make model building accessible to a much wider audience than what has been the case before.

Dr. Page is the Leonid Hurwicz Collegiate Professor of Complex Systems, Political Science, and Economics at the University of Michigan. He also teaches a popular course on model building at *Coursera*, a “massive open online course (MOOC)” provider.

The purpose of writing the book on model building is, as Dr. Page likes to say, to help people become better thinkers and to become more informed citizens of the world. Page seeks to help people see the beauty of models and that modeling can be fun. The book's overall aim is to make models accessible to more people and to illustrate the practical uses of models. It serves as a very useful dictionary of the various models in use today. It does not cover hundreds of models – just a few of the more important models from a variety of disciplines. The models fall into three general categories: (1) simplifications of the world, what he calls an *embodiment approach*, that strips away unnecessary dimensions and attributes; (2) mathematical analogies, the *analogy approach*, which tries to capture the essence of a process – not the exact process itself; and (3) exploratory, artificial constructs, the *alternative reality approach*, which intentionally does not represent reality, but provides a place where people can experiment and think outside of our current reality.

A main point of the book is that no one model is good enough to be used alone; and that no one model can be used in all circumstances. Accordingly, Page advocates a multi-model approach which he calls “many model thinking.” In his view, many model thinking leads to better decision-making; more robust designs of problem-solving models; and better predictions of business, social, and scientific phenomena. As Page (2018) states: “The logic behind the many-model approach builds on the age-old idea that we achieve wisdom through a multiplicity of lenses.” In an extension of this idea, Page (2018) notes that “...any collection of diverse models (or people) will be more accurate than its average member, a phenomenon referred to as the *wisdom of crowds*.”

Page even provides a theorem in the book to explain why he believes the wisdom of crowds is a valid construct. Overall, Page shows in the book that using more than one model permits one to look at problems through multiple lenses.

The world is awash in data. By means of the Internet, anyone can access a vast amount of data on almost any topic. The rationale for building models is that data alone is not enough. One needs models to organize the data and to make sense of it.

Models also help in understanding complexity; in other words, understanding the complex nature of the world (and universe) in which we live. One of Page's goals in writing this book is to give his students and readers of this book tools to improve their abilities to reason, explain, design, communicate, act, predict and explore (a construct which Page has formed into an acronym, REDCAPE, to help people remember the benefits of many-model thinking). Page (2018) quotes Charlie Munger, the Vice-Chairman of Berkshire Hathaway and a renowned thinker, as saying: "To become wise, you've got to have models in your head. And you've got to array your experience – both vicarious and direct – on this latticework of models."

A further benefit of models is that they impose a cognitive discipline on us that helps to counter our inherent cognitive biases – such biases as overweighting recent events and loss aversion (Kahneman, 2011, p. 282), to name a couple. Such biases result from our limited capacity as humans to store and process data in our heads; as well as the emotional factors that inhibit our ability to think reasonably. Models help us overcome these limitations and become better thinkers.

In *The Model Thinker*, we are introduced to a paradigm of how models transform data into wisdom. The process is combined into a *wisdom hierarchy* and works this way: (1) at the bottom of the wisdom hierarchy lie *data*; (2) *information* names and partitions data into categories; (3) *Knowledge* organizes information; and (4) *wisdom* is attained when one is able to identify and apply relevant knowledge. Dr. Page maintains that many-model thinking is required to attain wisdom.

Dr. Page (2018) defines models as "formal structures represented in mathematics and diagrams that help us to understand the world." In his book, *Theory Building*, which is a complete treatise on constructing theories, Dubin (1978) provides a similar perspective on model building: "Most theoretical models are presumed to represent a complex portion of the real world..." (p.8).

The course that Dr. Page teaches at *Coursera* is a massive open online course (MOOC). MOOCs provide for unlimited participation and open access via the web. The course is free or can be taken by paying a small fee and getting a certificate upon completion. There are more resources available to the course participant who pays the fee. I found the course to be generally helpful in further understanding the material in the book. Reading the book and taking the Coursera course together is a good combination.

Dr. Page has provided a useful and practical treatise on models and model building. He has provided a convincing argument that many-model thinking is superior to using just one model to understand a phenomenon. While Page has attempted to use a non-mathematical, easy-to-understand approach to understanding models, it is nonetheless a difficult field of study. Many

people may come away from having read this book (and/or taking the accompanying Coursera course) a little frustrated in their lack of understanding of the material. But given the importance of model thinking in today's complex world, I believe that those involved in business, academia, the sciences, and other fields and disciplines involving rigorous study and application, should at least give the book and/or course a try. One may ultimately have to obtain expert advice on model building, but knowing the uses and limitations of various models will help in finding the right expert advice and being able to critique and effectively use the advice given.

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Call for Paper Submissions and Reviewers

The *Business Forum*, a scholar-practitioner, peer-reviewed journal published by the College of Business and Economics at Cal State LA, invites submissions and reviewers for its Spring 2020 “Sustainability” Issue.

Target timeline:

- October 15, 2019: All submissions are due electronically via the link below:
<https://submissions.scholasticahq.com/login>
- Winter 2020: Issue is published in print and online

The *Business Forum* has provided scholarly advice with application to business practices since 1975 and it is now revitalized in a modern print-online format. This is not a traditional academic journal. Our articles aim to advance business practice through application of research or theoretical synthesis of information relevant to business. We adhere to The American Psychological Association (APA) style and our target article length is from 2000 to 3000 words, inclusive of all artifacts such as tables, figures, and references.

The “Sustainability” issue welcomes original manuscripts on a wide range of topics related to Sustainability from a business perspective. Sustainability-related opportunities and issues operate in the entrepreneurial landscape and are interdisciplinary by nature. As such, we welcome and encourage articles from various disciplines with a focus on specific concerns related to Sustainability. Examples of issues that can be addressed include:

- How to foster enhanced sustainability in small and midsize entities
- What motivates companies to invest in sustainable options
- What role does renewable energy play in environmental and economic sustainability
- Does social sustainability provide long-term benefits to stakeholders? What are those benefits and time frames?
- Which stakeholders benefit most from comprehensive sustainability projects? Why?
- Is reporting of sustainability results unbiased? What information is conveyed and how is it used?
- Which companies/industries report on sustainability and what do they report on most frequently?
- How has sustainability benefited healthcare or healthcare facilities?
- Strategic steps to enhance sustainability in healthcare
- How useful is sustainability reporting to various stakeholders?
- What are the best ways to fund Sustainability?
- What governmental incentives are there for Sustainability?
- What role do investors play in Sustainability?
- What is the global impact of Sustainability on people?
- How do LA region companies excel in Sustainability?

Whether your paper is about synthesizing theory and practice, applying interesting research to contemporary business issues related to Sustainability, or illustrating both in a rigorous and vivid case, all submissions must curb academic jargon in favor of incorporating research findings in accessible language for non-specialist business audiences. Each submission should include practical insights and recommendations for managers.

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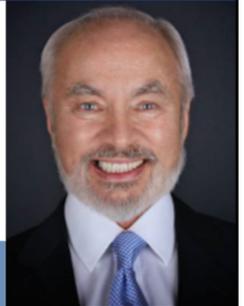
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