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Gender, ethnicity and entrepreneurship in initial public offerings: illustrations from an open database*☆

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ABSTRACT

This paper describes the variables in a freely available database of all emerging growth firms (EGF) that made an initial stock offering (IPO) on US public markets from 1990 through 2010. Our expectation is that researchers from a variety of disciplines can use this data to answer a wide variety of social science questions and combine it with other databases. To illustrate how the data can be used, we describe the gender and nationality of the top management teams (TMTs) and board of directors (BoDs) of these firms. We confirm that women are under-represented in all functional positions, but, in contrast to much of the popular press, we find that statistically Silicon Valley firms perform better than the national average. Gender ratios differ by function with women most prevalent at the CFO position and are most prevalent in the biomedical industry. Using undergraduate education, as an identifier for nationality, we find that, contrary to the popular press, there are more European than Asian immigrants in the TMTs. This suggests that European immigrants are more likely to immigrate with advanced degrees, while the Asian immigrants have only Bachelor's degrees. In the immigration literature, it has been observed that specific immigrant groups concentrate in particular occupations. To test for this effect, we study the backgrounds of all identifiable Taiwanese immigrants. A remarkably high concentration of Taiwanese TMT members were from two Taiwanese universities' electrical engineering departments, then received U.S. graduate degrees, particularly from UC Berkeley, and entered semiconductor-related industries. This database will contribute to reproducible social science as the same quality-controlled data is now available to all researchers.

1. Introduction

In the U.S. political economy, the life-cycle of the most successful entrepreneurial firms usually contains an initial public offering (IPO). From a macro-political economy perspective these firms, while a highly select population, are inherently significant, because they include nearly all of the largest firms created in the last two decades. From an analytical perspective, studying IPO firms is advantageous because U.S. legal requirements mandate that the listing firm provide detailed information on its operations and key persons. Their importance, combined with the level of detailed information revealed at their public offering, make these firms of great inherent interest to scholars and policy-makers, alike. New entrepreneurial firms, many of which are funded by venture capital, are an important component of the U.S. national innovation system (on U.S., see Mowery 1992 on venture capital, see Kenney, 2011). In this innovation model, particularly in information, communication, and biomedical technology-related entrepreneurship, an initial public stock offering is an important step in the firm's life. With a few notable exceptions, such as SAS and Epic Systems, over the last five decades successful U.S. technology-based firms have either been acquired or have undertaken IPOs.

This paper describes a freely available database of all entrepreneurial firms undertaking an initial public stock offering during the twenty-one year period from 1990 through 2010.[1] We

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[1] Since 2010 we have provided data to more than 150 researchers. Most of the requests have come from doctoral students in business schools, including UC Berkeley, MIT, Harvard, Yale, and Wharton, but we have also had requests from university faculty and research staff as well as numerous research institutes such as Brookings and the World Bank. Data has been provided to the venture capital-financed firm Findthebest.com and The Private Capital Research Institute.

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select a few salient variables regarding gender and national origin to illustrate potential uses of the database to answer a number of scholarly questions, especially in regards to entrepreneurship in a variety of sectors, but particularly the science and technology-based firms that make up more than 50 percent of the entire firm population.

Because the database is an Excel format, the ability to combine it with other databases, public or private, should accelerate further research on entrepreneurship in the social and management sciences. The value of this database is not only intrinsic, but also in the fact that it can be rather easily linked to a wide variety of other databases including Starmetrics database described by Lane et al. (2015) and the patent database described by Li et al. (2014). The database can also be extended by using other commonly available databases such as VenturExpert, CRISP stock price data, the NETS database, and other commercial databases providing data extracted from financial filings. Other uses could be to examine the effects of policies such as the SBIR Program in creating successful firms or the fate of university spinoffs. In essence, this is a resource that others can build upon in their research.

This brief contribution describes the database and undertakes some simple illustrations of how it might be used. The first section discusses IPOs and previous usage of the data from IPOs in academic papers. This is followed by a description of the publicly available variables in the database. The first illustration of the uses of the database is an exploration of gender issues in these firms by various managerial and directorial functions and differences based upon industry or geography. The second illustration is a description of the national origin of the managers of these firms, including a discussion of the education of these managers with particular emphasis on foreign PhDs. To further demonstrate the value of the database we examine aspects of the career trajectories of all Taiwanese university graduates serving on the TMTs. The concluding section suggests some benefits that such an open-source database may provide to the scholarly community

2. IPOs

An IPO is a singular event in a new firm's life-cycle when its transitions from being private to being publicly held. Because of the high bar for undertaking a public offering, IPO firms are among the most successful and for this reason alone are of great interest. The other attraction is the level of detailed information that encompasses key personnel, firm promoters, significant business contacts (such as alliances with other organizations) and various other disclosures. Naturally, its uses for scholarly purposes have not gone unnoticed. Of particular interest has been the attributes of top managers and board members (e.g., Amason et al., 2006; Beckman et al., 2007; Chen et al., 2008; Cohen and Dean, 2005; Higgins and Gulati, 2006; Kim and Higgins, 2007). Another field of research has exploited the disclosures to examine the affiliations of IPO firms and their backers with other organizations (Pollock and Gulati, 2007; Hochberg et al., 2007). For example, Gulati and Higgins (2003) extracted data from a sample of biotechnology IPO firms to explain the signaling value of different types of interorganizational partnerships in the contexts of different types of uncertainty and found that venture capital endorsements were most important during "cold" markets, while investment bank endorsements were more beneficial during "hot" markets.

Founder retention in entrepreneurial firms is of interest both in finance and general management. The employment of one or more of the founders at the time of the IPO has been found to increase a firm's value by sending a positive signal to investors (Certo et al., 2001; Fischer and Pollock, 2004; Jain and Tabak, 2008; Nelson, 2003). Little is known about whether function affects founder retention. There is evidence that retention may also be higher for the technical founders than for the general managers, though this has not been tested on a large sample of IPOs (Boeker and Karichalil, 2002). Pollock et al. (2009) found that CEO-founders were more likely to be present at the IPO when there was greater business certainty in the particular sector. Put differently, when the sector was competitive and uncertain the founder was less likely to be CEO at the time of the IPO. The addition of high-prestige CEO replacing the founder may be the result of the firm wishing to create the perception of legitimacy among public investors (Chen et al., 2008; Cohen and Dean, 2005).

Despite the intense interest in entrepreneurship, and the fact that many of best known U.S. technology firms including Microsoft, Intel, Oracle, Google, and Yahoo! retained their founders in key positions through the IPO and beyond, there has been minimal research on the persistence of founders from the firm's inception to a liquidity event such as an IPO and its impact on firm performance (for exceptions, see Beckman and Burton 2008; Beckman et al., 2007; Liu et al., 2012).

IPOs have also been used in agency theory studies, because the firms are undergoing a transition from privately held firms with principals such as venture capitalists closely monitoring the firm's behavior, to a situation where they are being monitored by less engaged actors such as securities analysts. This interest unleashed a wave of studies regarding the board composition at the time of the IPO (Beatty and Zajac, 1994; Certo, 2003; Filatotchev et al., 2006; Bruton et al., 2010).

While there has been significant use of IPO data to ask questions specifically related to IPOs, there is a much larger research community that should be able to use portions of the database in ongoing projects in which IPOs only play a small part. For example, industry studies students might find it useful to extract data on IPOs in specific industries, or just identify the IPOs in a particular industry. Studies of the spatial agglomeration or specializations of venture capital firms could utilize IPOs as a success measurement. A cross-national comparison of high-impact entrepreneurship is receiving more attention through venues such as the Global Entrepreneurship Monitor, but there have been fewer comparisons between IPOs in different markets (Doidge et al., 2013).[2] The information in our database could simplify conducting such comparisons because the U.S. data is now available in an easily usable form. Because U.S. stock markets are the mecca for foreign EGFs, it is possible to compare U.S., Chinese, and Israeli EGFs that list on U.S. markets.[3]

there is a list and description of the data that we have extracted and is already provided or in the future will be provided on request. In addition to the firm data, we have assembled a database of all the managers and directors of these firms as listed in IPO prospectus, where each unique individual is given an ID as some individuals were involved in more than one IPO (this is a unique feature of the database and will save substantial time for researchers).

Because this is a database of EGF IPOs, it is a subset of all firms that have gone public. The database currently contains 3939 firms and 43,695 individuals who were managers and directors of these firms. However, because some portions of the 1990–1996 data are not yet fully completed, we confine the substantive illustrations to the 2028 firms that conducted an IPO between 1996 and 2010 and that were under 30 years of age at the time of their IPO. We are now expanding the database through 2014. For the years from 1990 to

[2] Jay Ritter has eased this comparison process as his website http://bear.warrington.ufl.edu/ritter/ipodata.htm has information on where data for IPOs in other nations can be accessed.

[3] This may be particularly interesting in the case of China, as many key Chinese Internet firms have listed on US markets. For example, Sina.com is an analog of Yahoo!, Baidu resembles Google, 51 Jobs resembles Monster.com, etc.