IPOs and Employment

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ABSTRACT

This paper studies the relation between the going public decision and employment growth experienced by IPO firms. We find that a typical IPO firm in our sample hires twice more employees around its IPO than during its life as a private firm. The number of employees increases by 31% during the two-year period around the IPO. Evidence shows that the most likely channel through which IPO firms increase their employment levels is the relaxation of their financial constraints, allowing firms to access both equity and debt markets resulting in better funding of their growth opportunities and an increase of the firm's human capital. We also examine the relation between employment growth and firm performance: IPO firms with greater employment growth exhibit better performance and lower delisting probability. Overall, these results highlight the importance of the IPO event and access to public capital markets for job creation by US firms.

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1. Introduction

Two of the most important economic debates in the aftermath of the Great Recession are the slow employment growth and the significant decline in the number of small companies making the decision to list on a stock exchange. Two important facts emerge when broad economic trends in the last three decades are analyzed. First, firms less than five years old have been by far the largest contributors to net job growth in the U.S. Importantly, 92 percent of job growth occurs soon after a company's decision to make an initial public offering.[1] It is clear that, as the IPO Task Force Report (2011) concluded, the "role of these emerging growth companies in creating American jobs cannot be understated." Over the same period, we have also witnessed waves of IPOs but in the last decade the U.S. economy has experienced a significant declining trend in the number of IPOs: after the one-year high in 1996 with 791 IPOs, in 2008 the number of IPOs was only 45 companies, with an average of 157 firms per year over the 2001-2008 period. The potential connection between the number of firms making the IPO decision and employment growth has led the current U.S. administration to introduce the Jumpstart Our Business Startups (JOBS) Act that was signed into law in April 2012. The objective of the bill is to make it easier for private companies to go public and raise the capital they need to hire new employees and put Americans back to work.

Despite the growing interest and concern among policymakers about the importance of IPOs in generating new jobs for the economy, there has been little research so far addressing this potential role of IPOs. This paper investigates -for the first time, as far as we know- the relation between the going public decision and employment growth experienced by IPO firms. Existing literature (for example, Pagano, Panetta and Zingales (1998)) has found that an IPO is not a stage that is automatically reached by all firms, but rather a choice made by each firm. Most importantly, there are competing theories that

[1] See Venture Impact (2007) by IHS Global Insight.

aim to explain the IPO decision and, as a consequence, there are significant differences in the predictions of these theories on the expected impact of the IPO decision on employment growth.

One of the most cited reasons for an IPO, present explicitly or implicitly in some theoretical models, is access to capital markets. This is a very important advantage for firms that have large current and future investments, growth opportunities and high leverage. Importantly, an IPO does not simply give a firm access to the stock market: by disseminating information across different investors, a firm can increase its funding opportunities beyond bank loans that are mostly used when a firm is privately-held. This means that an IPO gives a greater bargaining power to the firm vis-à-vis its lenders and can thus attract a larger supply of external finance, or lower cost of credit (or both) as suggested by Rajan (1992). As an IPO provides a firm with an infusion of cash through IPO proceeds and a subsequent access to debt and equity capital markets, one may expect IPO firms to use these funds to grow through organic investment as well as inorganic channels such as mergers and acquisitions (M&As). It is also plausible to expect that an IPO allows a firm to increase human capital by hiring new employees, to complement its capital growth through physical investment, and to generate new jobs for the economy. In other words, theories that explain the IPO decision as largely driven by the need to access new sources of funding should predict employment growth in the post-IPO period.

However, there are other theories about the IPO decision that should predict no impact on employment growth. If the IPO is driven by a desired change of ownership and control, such as an exit mechanism, then we should not expect any impact on firm-level employment growth. For example, in Zingales (1995) the IPO is the outcome of a value-maximizing decision on the part of the founder who wants to eventually sell out either her entire ownership stake or part of it. It is well known that in many countries where venture capital (VC) finances privately-held firms, the IPO is an important mechanism through which venture capitalists exit the firm. Ritter (1991) also proposes that IPOs are decided by

founders to exploit a window of opportunities when the shares in their industry are perceived to be overvalued. Furthermore, existing literature has also identified a very clear hot-cold cycle of IPOs[2] and managers of firms making an IPO in a hot market issue more equity at the IPO stage than firms making an IPO in a cold market but the former do not invest more in the IPO year and subsequent years (Alti (2006)). If any of these channels drive the IPO decision then we should not expect that firm-level employment will change once the firm makes an IPO.

To examine the relation between going public and employment, we consider a sample of 3,657 firms that went public from 1980 to 2010. A typical firm in our sample exists for 16.24 years as a private firm before its IPO. During this existence, the average (median) firm hires approximately 112 (26) new employees per year from its founding date to one year before its IPO. By contrast, the creation of new jobs doubles around the IPO. From one year before to one year after its IPO date, the average (median) firm in our sample adds almost 238 (57) new employees per year. To put this into perspective, the average (median) firm has around 1,530 (240) employees at the year-end before its IPO, resulting in 31% increase in employment in the two-year period around the IPO date. This finding highlights the importance of the IPO event and access to the public equity market for job creation by US firms.

We further explore the time-series pattern of employment growth rates experienced by our sample firms in order to substantiate the importance of the very early stage of the life of a public firm for the process of job creation. The average (median) employment growth rate of a firm in our sample is almost 43% (24%) during the IPO year, while the average (median) annualized growth rate from the IPO year to the end of the 1st post-IPO year is 37% (23%). As firms mature, their growth rates decline, as expected, but remain high for the first few years of the post-IPO period. The average (median) annualized growth rate between the IPO year and the end of the 2nd post-IPO year drops to 27% (19%), while the average (median) rate becomes 21% (16%) by the end of the 3rd post-IPO year. This finding

[2] See Ibbotson and Jaffe (1975), Ritter (1984), and Ibbotson, Sindelar, and Ritter (1988, 1994).

further confirms our initial insight that a public firm experiences the highest growth rate in its employment around its IPO date and the subsequent few years.

To further substantiate the importance of the IPO event for job creation and growth, we also examine the complete time-series profile of employment growth rates for our sample of IPO firms, starting from two years before and going up to 30 years after their IPO. Strikingly, a typical firm experiences the largest increase in its employment level during its IPO year. More specifically, the average employment growth rate during the IPO year is 43%, 36% during the year following the IPO, and 33% during the year preceding the IPO. The increase in employment level of a typical firm monotonically decreases after the going-public year, suggesting that the IPO year and the immediately subsequent years is the time when a public firm increases its employment level the most in its public life.

This time-series pattern of employment growth rates points towards the critical association between the IPO event for creation of new jobs. One interpretation of these results so far is that growth opportunities are an important determinant for the average private firm deciding to make an IPO, the reason being the need of new external financing to fund these opportunities. Accessing financial markets through an IPO leads not only to higher capital investments but also to human capital growth suggesting an important complementarity between physical and human capital at least for the initial period around the IPO. Following Pagano et al. (1998), there are two potential approaches that one could use to investigate the association between the IPO decision and subsequent employment growth: either using the *ex ante* characteristics of the firms that make an IPO or the *ex post* consequences of the IPO decision on observed firm policies, in our case employment growth. Pagano *et al.* (1998) argue that in the presence of rational decision makers the two approaches should provide consistent results. Lack of data on private firms does not allow us to use the first approach and instead we investigate fully *ex post*

consequences of the IPO decision on employment growth. We do so by controlling for a number of firm characteristics that make otherwise influence employment growth. More importantly, we investigate the channels through which an IPO can influence employment decisions. To do so, we take a cross-sectional perspective and identify firms in our sample that are more likely to direct the infusion of financial capital towards hiring new employees and human capital growth.

Consistent with existing theories, we start by investigating the relaxation of financial constraints channel. In this regard, there are two different dimensions of financial constraints that we should consider. First, an IPO provides an immediate access to public equity capital, relaxing *short-term capital constraints*. Second, by gaining access to the equity market and abiding with listing requirements, a firm will disseminate a whole gamut of information about its financial position to the generality of investors, both equity and debt investors. This means that the consequences of an IPO are not confined to the short term bur rather have *long-term consequences* on the firm's financial constraints. Therefore, the importance of an IPO for relaxing short-term capital constraints and improving the ability to hire new employees might be expected to be more pronounced for firms with a greater dependence on external equity finance.

To the extent that such firms might be more capital constrained before going public, they might be hiring more aggressively at their IPO stage. Consistent with this conjecture, when we split our sample into firms with high and low dependence on external equity finance, we find that the former group experiences an employment growth rate of 46% during the IPO year, while the latter group experiences a rate of only 32%, the difference being significant at the 1% level. We also observe that IPO firms in high-growth industries, measured by either growth in assets or growth in sales, increase their employment at the time they go public by a greater amount than IPO firms in low-growth industries.

This finding suggests that firms hire new employees and increase investment in human capital to complement their physical assets investment.

Firms raise investment capital at an IPO through the sale of primary shares, while insiders and founders cash out through the sale of secondary shares. If an IPO provides a firm with an infusion of funds to invest in human capital and physical assets, we would expect firms with a greater amount of primary proceeds to hire more employees. Supporting this view, we find that IPO firms with primary proceeds greater than the median primary proceeds for our sample increase employment by 48% during the IPO year, while IPOs with below-median primary proceeds increase employment by 36%.

Going public may affect a firm's ability to hire not only through the equity capital raised at the IPO but also through the firm's improved access to debt and equity capital markets post IPO. Consistent with this view, we find that not only equity but also debt capital raised after the IPO is positively related to employment growth. The second effect is consistent with the view expressed by Pagano et al. (1998) that going public improves a firm's ability to utilize debt financing due to a reduction in borrowing cost.

We find two additional important results as far as this channel is concerned. First, in a multivariate setting spanning the first three years after the IPO decision we find that the association between primary proceeds and employment growth exists in the IPO year and the year after, and ceases to exist afterwards. More importantly, the association between subsequent new funding, especially debt issues, and employment growth becomes more important from the first year after the IPO onwards. These dynamics indicate that while primary proceeds may be important to alleviate short-term financial constraints, an IPO also alleviates the long-term constraints by giving the firm better access to debt markets as well. Second, when we investigate the cross-sectional heterogeneity of IPO firms we find that firms that (a) increase their debt the most, and (b) experience the largest reduction of their cost of debt are precisely those associated with higher employment growth.

One important dimension of our analysis is net employment growth at the firm level, i.e. organic employment growth rather than new employment acquired after M&A activity. This speaks directly to the concern of policymakers regarding firms' ability to generate new employment and is important given the existing IPO literature. When a firm enters the public equity market, its ability to engage in acquisitions is enhanced by the capital infusion at the IPO as well as subsequent access to both equity and debt capital markets. Celikyurt, Sevilir and Shivdasani (2010) document evidence that IPO firms are very active acquirers starting in their IPO year. This suggests that the employment growth observed in IPO firms might be largely driven by their M&A activity, i.e. relocation rather than creation of jobs. While we find that the M&A behavior of IPO firms is important for employment growth, we also observe that even IPO firms without acquisition activity in their early post-IPO years exhibit a significant increase in employment. In other words, the IPO decision is associated with organic employment growth and not just an increase in the employment figures which may be due to M&A activity. This result is very important from a broad economic perspective because it shows that IPO firms are associated with new employment.

Approximately 40% of the IPO firms in our sample are backed by venture capital (VC). To the extent that VC-backed private firms are more growth and innovation oriented, and are likely to have greater equity dependence than non VC-backed firms, one might expect these firms to experience a greater increase in their employment at IPO. Consistent with this view, we find that employment growth during the IPO year averages 49% for VC-backed IPO firms, while it is 39% for non VC-backed firms, the difference being significant at the 1% level.

Overall, our cross-sectional analysis confirms our maintained hypothesis that firms for which the equity market is more important source of financing, and firms for which the IPO event is more likely to relax financial constraints, experience the largest increase in human capital and employment during their

IPO period. Upon further investigation we find that firms that experience the largest reduction in the cost of capital following an IPO and those that experience the largest increase in the amount of debt that they issue are precisely those firms that experience the largest increase in employment growth after the IPO. These results are consistent with the maintained hypothesis that by gaining access to capital markets, and becoming more transparent, firms can increase their bargaining power with pre-IPO financiers leading to higher debt and lower cost of capital with a consequent positive impact on employment growth.

After establishing the significant increase in the employment of firms at the IPO stage, we examine the relation between employment growth and firm performance. We find that employment growth is positively associated with firm value and operating performance. Employment growth is also negatively related to the probability that an IPO firm gets delisted in the first five post-IPO years. These results suggest that firms with a greater human capital investment exhibit better performance and are more likely to survive as public firms after their IPO.

Our results contribute to two different strands of the literature. First, they make a contribution to the literature investigating the determinants of the going public decision. Existing research on why firms go public establishes several important motives for the going-public decision. Pagano et al. (1998) study a sample of Italian firms and find that firms go public not to raise capital for financing future investments and growth, but to rebalance their capital structure and to exploit sectoral misvaluation. Lowry (2003) shows that firms' demand for capital and investor sentiment are the most significant determinants of IPO volume. Using a sample of German firms, Boehmer and Ljungqvist (2004) show that firms go public when their investment opportunities and valuations become attractive. Kim and Weisbach (2008) provide evidence that financing of capital expenditures and the desire to benefit from potential overvaluation are motives for seasoned equity offerings (SEOs) and IPOs. Celikyurt, Sevilir

and Shivdasani (2010) study the acquisition motive in IPOs and show that IPO firms are prolific acquirers and their acquisition expenditures are greater than their CAPEX or R&D outlays. Our paper adds a novel finding to this literature by studying the dynamics of employment profile of firms around the IPO stage. We find that public firms experience the most significant increase in their employment at their IPO stage over their life cycle of the first thirty years after going public.[3]

Our results also contribute more generally to the literature that investigates how changes in ownership influences employment and productivity (see, for example, Lichtenberg and Siegel (1987), Long and Ravenscraft (1993), McGukin and Nguyen (2001) and Harris, Siegel and Wright (2005) and specifically to the growing literature on labor and finance. So far the latter literature has focused mostly on the impact of leveraged buyouts and private equity transactions on employment. Examples include Kaplan (1989), Muscarella and Vetsuypens (1990), Lichtenberg and Siegel (1990), Davis et al. (2011) for U.S. evidence, Boucly, Sraer and Thesmar (2012) for French private equity transactions, and Wright, Thompson and Robbie (1992) and Amess and Wright (2007) for U.K. evidence. We are the first to investigate the impact of the going public decision on employment and investigating the potential channels through which the association arises.

The rest of the paper is organized as follows. Section 2 describes our sample construction and data. Section 3 presents our main results. Section 4 concludes.

2. Data and Descriptive Statistics

We examine the relation between going public and employment by considering a sample of IPOs that took place in the period 1980-2010. To construct this sample, we begin with all IPOs available at Thomson Reuters' Global New Issues database. Following common filtering criteria, we exclude real

[3] A contemporaneous policy-oriented report by Kenney, Patton and Ritter (2012) examines the revenue and employment growth of all IPO firms in the US from 1996 to 2010 and finds that IPO firms exhibit a significant increase in employment and revenues starting in the IPO year and peaking in the first ten years after the IPO.

estate investment trusts, closed-end funds, rights, units, foreign issues, and ADRs. Our search yields 8,569 offerings between January 1980 and December 2010. We then merge this sample with CRSP and Compustat in order to obtain stock market data and information from the firms' financial statements, which results in 7,953 offerings. The time-series distribution of these offerings is provided in column (1) (*All IPOs*) of Table 1.

[Insert Table 1]

We obtain data on firm employment from Compustat. The focus of Compustat is on public firms, but it backfills information for these firms even prior to the IPO when such data are available. Although public firms are required to file audited financial statements for up to several years prior to their IPO, the information on pre-IPO employment is often missing. We are able to compute the employment growth rate during the IPO year for only 3,657 firms in our sample. In column (2) (*IPOs with EMP*) of Table 1 we provide the time-series distribution of these offerings with sufficient information.

We obtain data on offering characteristics such as VC funding prior to the IPO, and the amount of primary and secondary shares issued at the offering from Thomson Reuters. *VC-Backed* is an indicator variable that takes the value of 1 if the offering is backed by a VC, and 0 otherwise. Column (3) of Table 1 shows that 40% of the IPOs with sufficient information are backed by VC firms. *Primary Proceeds* is the ratio of primary shares issued in the offering to the sum of both primary and secondary shares. In column (4) we document that for the average firm in our sample, 86% of the proceeds are from the sale of primary shares. *High Proceeds* is an indicator that takes the value of 1 if an IPO raises above-median amount of primary shares. The time-series distribution of the indicator is reported in column (5). Next, we augment our sample of IPO firms with their founding dates provided by Prof. Jay Ritter on his web-site. *Time as Private* is defined as the difference (in years) between the IPO year and the year when the firm going public was founded. The average firm in our sample exists as a private

entity for 16.24 years before accessing the public equity market, albeit the median is only 8. We also construct an indicator variable, *Long Time Private*, which takes the value of 1 if a firm's "private age" at the IPO exceeds the sample median, and report the time-series distribution of this indicator in column (7).

We hypothesize that the importance of an IPO for relaxing capital constraints and improving firms' ability to hire new employees should be more pronounced for firms with a greater dependence on external equity finance. We construct a measure of *Equity Dependence* following Rajan and Zingales (1998). Specifically, we begin by categorizing all firms on Compustat during the period 1980-2010 into industries, where industry is defined at the 2-digit SIC level. For each firm, we compute annual net amount of equity issues as the difference between the sale of common and preferred stock (SSTK) and purchase of common and preferred stock (PRSTKC), and then sum these firm-specific annual amounts over time. We also compute each firm's investment in fixed assets during the entire period as the sum of its annual capital expenditures (CAPX). A firm's dependence on external equity is defined as the ratio of the sum of net equity issues to the sum of capital expenditures. We next create an industry-specific measure of external equity dependence by assigning to each industry the median firm-specific ratio for all firms that fall into that industry. By construction, the industry-specific measure is time-invariant. *High Equity Dependence*, whose time-series distribution for our sample firms is shown in column (8), is an indicator that takes the value of 1 if a given industry has an above-median dependence on external equity finance.

In column (9) of Table 1 we report the time-series distribution of one of our main variables of interest, namely: employment growth rate during the IPO year. *Growth Rate IPO Year* is constructed as negative 1 plus the ratio of the number of employees (EMP) of the firm as of the year-end following the IPO date to the number of employees of the firm as of the year-end preceding the IPO date. Column (9)

shows that the average firm in our sample experiences an employment growth rate of 43% during its IPO year. Clearly, this measure exhibits substantial time-series variation and this calls for including time fixed effects in our formal analysis.

Lastly, we also hypothesize that the growth needs of our firms should play an important role for their hiring decisions. Hence, we create two indicators*, High Growth (Assets)* and *High Growth (Sales)* that take the value of 1 if an IPO firm operates in a high-growth industry based on assets (AT) or sales (SALE), respectively. To construct the industry-specific indicators, we follow the same approach as the one used for the construction of the measure of external equity dependence. Specifically, we categorize all Compustat firms into 2-digit SIC code industries during the period 1980-2010. For each firm during year t, we calculate annual growth rate as negative 1 plus the ratio of X_t/X_{t-1}, where X is either total assets or sales, and then create firm-specific time-invariant growth measures by looking at the time-series median of the annual growth measures. Then, we assign to each industry the median firm-specific growth measure for the firms that fall into that industry. High-growth industries are sectors with above-median industry-specific growth measure. The last two columns of Table 1 summarize these measures.

3. IPOs and Employment Growth

3.1 Cross-sectional Determinants of Employment Growth

We next investigate, in a univariate setting, the association between employment growth and various firm characteristics that can shed light on the channels through which such association can be obtained. In our analysis we investigate employment over the first three years after the IPO year. While arbitrary, this period strikes a balance between investigating exclusively the short-term ex post consequences of the IPO decision on employment growth and the long-term dynamics that are the consequence of the access to capital markets. We present our results in Table 2.

[Insert Table 2]

An IPO not only provides a firm with an immediate infusion of equity capital raised through the sale of primary shares, but also allows the firm to access public equity markets through subsequent SEOs. Both forms of equity capital would be more important for firms that rely more on external equity to finance their business and operations, and hence, IPO firms with greater equity finance dependence should be expected to hire more employees around their IPO relative to IPO firms with lower equity finance dependence.

To examine this conjecture, we classify our sample firms into two groups. The first group consists of firms operating in sectors of the economy with above-median dependence on external equity finance, while the second includes firms in industries with a level of equity finance dependence below the sample median. Being a measure of financial constraints at the industry level, this should not suffer from endogeneity that firm-level measures face and thus allowing us to derive stronger results. We begin by examining how the employment decisions of IPO firms vary with their dependence on external equity financing. As the first row in Table 2 shows, firms in industries with greater dependence on external equity experience larger increase in employment during the IPO year and during the subsequent one-, two-, and three-year periods. This finding suggests that going public, i.e. accessing the public equity market for the first time, relaxes more the financing constraints of private firms in industries that are more dependent on external finance. Thus, it allows them to invest relatively more in employee human capital through the equity capital they raise at the IPO.

The second row investigates the impact of the reduction of the cost of debt following an IPO on employment growth. If an IPO leads to an increase of bargaining power of the firm vis-à-vis its pre-IPO lenders, then cost of debt should decrease leading to an additional relaxation of financial constraints as suggested by Rajan (1992). We follow Pagano et al. (1998) and define the variable Reduction of Cost of

Capital (RCC) as 1 plus the cost of debt for the IPO firm, scaled by 1 plus the median cost of debt for all Compustat firms for that calendar year. Cost of debt is captured by the ratio of total interest expense (XINT) to total long-term and short-term debt (DLTT + DLC). Firms with above-median (below-median) change in RCC are categorized as *High* (*Low*). We find an interesting effect of the RCC on employment growth: there is no difference between high and low RCC firms in the IPO year but starting from the first year after the IPO firms with the largest RCC are associated with higher employment growth. This shows that the effect from the IPO on firm's access to debt markets is not immediate but as the firm disseminates more information in the post-IPO period its access to debt markets improves with a consequent positive impact on its investment in human capital.

The third row of Table 2 examines the employment growth of IPO firms based on their acquisition behavior. If an IPO improves a firm's ability to undertake acquisitions, as suggested by Celikyurt, Sevilir and Shivdasani (2010), it might be possible that the high employment growth at IPO firms is a manifestation of their acquisition intensity, rather than their ability to generate new jobs. In other words, IPO firms exhibit a high rate of employment growth not because going public allows them to create new jobs, but because it allows them to acquire other firms and increase the number of their employees. As Table 2 shows, although IPO firms engaging in M&A activity experience greater employment growth than IPO firms without acquisition activity, even IPO firms with no acquisition activity exhibit a meaningful employment growth starting in the IPO year and extending over one, two and three years after the IPO. This result suggests that employment growth rates in IPO firms cannot be completely explained by these firms' acquisition behavior and calls for the inclusion of M&A activity in our multivariate analysis.

Celikyurt, Sevilir and Shivdasani (2010) show that IPO firms use the capital they raise at the IPO to grow their assets and productive capacity through CAPEX and R&D. If firms need new hires to

complement their investment in physical assets, one might expect that IPO firms with greater growth needs in terms of assets and sales should also increase their employment levels more than IPO firms with a lower asset and sales growth. To investigate, we split the sample into IPO firms in high-growth industries, and IPO firms in low-growth industries.

Our findings are consistent with the conjecture that the IPO event allows firms to not only grow their physical assets, but also to increase their employment in order to match their growth needs. Note from the fourth row of Table 2 that firms in sectors with above-median asset growth increase their employment at a faster rate compared to firms in industries experiencing asset growth below the sample median.[4] This finding suggests that going public is associated with greater growth not only in physical assets but also in human capital. Hence, examining the employment pattern of firms around their IPOs offers a more thorough understanding of how going public affects firms' complete investment profiles, including investment in both physical and human capital.

There are two types of shares issued and sold at an IPO. Primary shares are issued to raise investment capital for the firm, whereas secondary shares are sold by insiders and founders to cash out. If firms go public with a motive to improve their ability to invest in human capital through the hiring of new employees, we would expect this motive to be stronger for firms that raise relatively more capital for investment during the offering. To capture such incentives, we identify firms with a greater amount of investment capital raised at the IPO by examining the amount of issued primary shares as a fraction of all shares offered. The fifth row in Table 2 confirms this intuition by showing that firms with primary proceeds above the sample median have higher employment growth rates than firms with below-median primary proceeds.

We also examine the employment growth of IPO firms as a function of their age when becoming public firms. Private firms that are younger at the time of their IPO might be more growth oriented and

[4] The same results are obtained when we use sales growth to identify high growth and low growth firms.

more capital constrained than older private firms to the extent that they choose to go public at an earlier age. Hence, such firms should be in greater need for human capital and use the IPO to raise capital for hiring new employees. Moreover, firms that have existed as private firms for a long period of time are more likely to have alternative financing channels, such as well-established banking relationships, which could have made their long private existence possible. Hence, the IPO might relax financial constraints for such firms to a lesser extent. To investigate, we examine how the employment growth rate at the IPO stage of our sample firms varies with their time as private entities before the IPO.

Supportive of this argument, row six in Table 2 shows that younger IPO firms, that is, firms with private age below the sample median experience a greater increase in their employment levels than firms with above-median private age. This finding emphasizes the importance of public capital markets in providing capital for young and growth-oriented firms to create new jobs and employment.

We also examine the employment growth profile of IPO firms based on whether they are VC-backed or not. If VC-backed firms are more growth and innovation oriented, and likely have greater dependence on equity finance, it may be plausible to expect that they exhibit greater employment growth around their IPO. Confirming this conjecture, the seventh row in Table 2 shows that, relative to non VC-backed firms, VC-backed IPO firms experience a greater increase in employment during their IPO year as well as in the subsequent one-, two- and three-year periods. This finding stresses the importance of public equity markets in fostering entrepreneurship and new firm creation given that VCs would have greater incentives to provide financing and other services to new start-ups if they expect they could raise sufficient financing at a future IPO for realizing the growth prospects of their portfolio firms.

One potential channel through which IPO can be associated with employment growth is through the supply of labor channel where workers may be more likely to offer their employment services to the firm post-IPO. This may happen either through the more significant visibility that the firm achieves after

the IPO or due to the reduction of default risk which is, in turn, associated with the unemployment risk faced by employees. Aggarwal, Krigman, and Womack (2002) argue that insiders might be willing to underprice IPOs if increased underpricing generates more attention from analysts and the media, resulting in higher prices when insiders sell shares at the expiration of the lockup period. Consistent with the predictions of their model, they find that underpricing is positively correlated with research coverage. We use the IPO Underpricing as a measure of the attention the firm receives from analysts and the media and find that firms with higher IPO underpricing are associated with higher employment growth, starting from the IPO year.

Finally we use the Z-score, as modified by Sufi (2009), to capture the change of the firm's default risk around the IPO year. The Z-score is constructed as the sum of the following: 3.3×(Earnings before Interest and Tax (EBIT) / Total Assets (AT)), 1.4×(Retained Earnings (RE) / Total Assets(AT)), 1.2×(Net Working Capital (WCAP) / Total Assets (AT)), 1×(Sales (SALE) / Total Assets (AT). We find that firms that increase their Z-score the most (thus experienced the largest decline in their default risk) are associated with higher employment growth. The results obtained from the analysis of the IPO underpricing and the change in the Z-score indicate that the supply of labor channel, i.e. labor may be more willing to offer employment services to the firm, may also be in place. Obviously, this particular channel and the relaxation of financial constraints are not mutually exclusive and could be in play simultaneously.

3.2 Evolution of Employment Growth

To understand better the effect of the IPO event on the employment profile of firms going public, in Table 3 we examine the annual change in the log of total employment for the average IPO firm from 2 years *before* to 30 years *after* the IPO event. Thus, years are defined in event time, relative to the firm's

IPO. Specifically, we track through Compustat the public existence of each of our IPO firms and calculate the change in log of total employment for each firm during each year. We focus on single years from year (-2) to year (+3) relative to the firm's IPO which is year (0). For the sake of parsimony, for years beyond the 3rd post-IPO year, we combine the average annual change in log of total employment for periods of several years, instead of single years. Specifically, we calculate for each firm the average annual change in the log of its total employment for years (+4) to (+10), years (+11) to (+20), and years (+21) to (+30). Thus, we have the complete time profile of annual changes in log of total employment for each sample firm relative to its IPO. We also construct a variable *Year (t)* that takes the value of 1 during the *t*-th year relative to the firm's IPO, and 0 otherwise. For instance, *Year (0)* takes the value of 1 for the IPO year of each firm, and 0 for all other years, *Year (+1)* takes the value of 1 for the first post-IPO year, and 0 for all other years etc. Then, we regress the annual change in log of total employment on the year indicators. Thus, the coefficient on each indicator represents the average change in log of total employment across all firms during this year, relative to their IPO. For instance, the coefficient on Year (+1) is the average change in log of total employment for our sample firms during their first post-IPO year, while the coefficient on Year (+2) is the average change in log of total employment during the second post-IPO year.

[Insert Table 3]

The estimation results are reported in Table 3, but in order to facilitate interpretation of our findings, we also plot them in Figure 1. Specifically, Table 3 reports numerical values of the estimates of the full set of age indicators, while each graph in Figure 1 plots the coefficients of the age indicators for the two pre-IPO years, the IPO year, and the first 15 post-IPO years.

It is striking to see from column (1) of Table 3, and the first plot in Figure 1, that the average firm in our sample experiences the largest growth rate in employment during its IPO year at a magnitude

of 43%. Employment grows at a rate of 36% in the year following the IPO, while it grows by 33% in the year preceding the IPO. In the thirty year period following the IPO the employment growth rate declines monotonically, averaging 8.7% annually. After the first five post-IPO years, the annual employment growth rate drops even further, to 5.9%. These observations suggest that firms experience the most significant increase in their employment levels during the IPO year, thus highlighting the importance of firms' access to the public capital market for job creation and employment.

Columns (2) and (3) in Table 3, and the second plot in Figure 1, confirm our earlier finding that firms with higher dependence on external equity increase their employment more than firms with lower external equity finance dependence. Interestingly, although there is a pronounced difference between the employment growth rates of these two types of firms around the IPO, in the long run after the IPO the employment rates for the two groups converge to each other. Columns (4) and (5), and the third plot in Figure 1, show that VC-backed firms exhibit a much greater increase in their employment relative to non VC-backed firms from one year before to one year after the IPO date. In the long run after the IPO, both types of firms experience similar levels of employee growth as they become mature public firms. Columns (6) and (7) compare the employment growth rates of IPO firms based on the level of primary proceeds raised at the offering. They show that IPO firms that raise more investment capital at the IPO increase more their employee human capital at the IPO year and the year following the IPO.

Columns (8) and (9) compare the employment growth of IPO firms as a function of the asset growth of their sectors of operation, and confirm the intuition that IPO firms in high-growth industries increase their employment more than IPO firms in low-growth sectors of the economy. The estimation results reported in columns (10) and (11) reach a similar conclusion using sales-based, instead of asset-based, growth measures. These results suggest that an important motivation for going public is to raise

capital for realizing growth opportunities, and growth in assets and sales comes together with growth in employment.

The last two columns in Table 3, and the last plot in Figure 1, compare employment growth rates of firms that are relatively young to the rates of firms that are relatively old at their IPO. There is a sharp difference in the employment growth rates of firms that have existed long as private firms at the IPO year and firms that "rush" to the public market. While firms with a smaller private age at the going-public stage increase employment at a rate of 59% during the IPO year, older firms exhibit only a 29% employment growth rate. This result suggests that the public equity market is particularly important for younger private firms, allowing them to realize their growth opportunities by hiring new employees.

Overall, an important and novel result from Table 3 and Figure 1 is that even mature public firms, with public age of up to 30 years, exhibit the greatest investment in employee human capital at the time of their IPO. Nowhere in the 30 years of their public life, do these firms hire as many employees as they do during their IPO year and the years immediately after. This finding provides a previously unrecognized motive for going public: Firms go public not only to raise capital to invest in physical assets and productive capacity, but also to invest in employee human capital. Hence, the years around the IPO appear as the most important time in the life of a public firm for creating jobs and employment.

3.3 Multivariate Analysis

We next move to examine the cross-sectional patterns documented so far in a multivariate framework to better control for pre-IPO and post-IPO firm characteristics. We first provide the descriptive statistics for the IPOs in our sample spanning from the IPO up to three years after the IPO in Table 4, and in Table 5 we show the regression results from three different specifications.

[Insert Tables 4 and 5]

The mean (median) log of the employment growth rate is 0.30 (0.22) in the IPO year and reaches 0.51 (0.41), 0.61 (0.51) and 0.67 (0.59) over the period from the IPO year o the first, second and third year respectively. A similar growth pattern is observed for capital expenditure and acquisitions. An average IPO firm in our sample undertakes capital expenditures equivalent to 24% of its asset value as of the beginning of the IPO year, and acquisitions equivalent to 9% of its asset value. Net equity issues follow a pattern highlighted by existing literature: there is a very significant issue of equity in the IPO year. An average IPO firm issues equity capital equivalent to 2.5 times its asset value as of the beginning of the IPO year. Net debt issues also increase over time in line with employment and reaches in the first three year period to 81% of the firm's asset value as of the beginning of the IPO year.

To understand the relation between employment growth, and investment and financing patterns exhibited by our sample firms in Table 4 in more detail, we begin in Panel A of Table 5 by estimating a cross-sectional regression in which the dependent variable is the (log) annual growth rate in employment estimated from the beginning of the IPO year to the end of the *n*-th post-IPO year, where n covers horizons from 0 to 3 years. Specifically, the first two columns in Panel A use the employment growth from the beginning of the IPO year to the end of the IPO year. Columns (3) and (4) focus on the annual growth rate estimated from the beginning of the IPO year to the end of the first post-IPO year. Columns (5) and (6) extend the time horizon by measuring the annual growth rate of employment from the beginning of the IPO year to two years after the IPO year. Finally, the last two columns examine a horizon that covers up to the end of the third post-IPO year.

We use two different specifications for our cross-sectional regressions. The first specification use industry-level measures of financial dependence (*High Finance Dependence*) to measure one channel of financial constraints. This is an indicator variable that takes the value of 1 if the firm is in a sector with high dependence on external equity finance (*High Equity Dependence*) and zero otherwise. When using

this type of specification we cannot include industry fixed effects. We do so in the second type of specification to control for unobserved heterogeneity at the industry-level. Panel A of Table 5 shows the specification with industry-level financial dependence, and Panel B shows the specification with industry fixed effects.

In our estimation models, we include as explanatory variables the amount of investment capital generated via the offering, measured by the amount of primary proceeds raised at the IPO as a fraction of the sum of primary and secondary proceeds (*Primary Proceeds*). We control for the presence of venture capital financing through an indicator that takes into account whether the going-public firm is backed by venture capital or not (*VC-Backed*). We also include the logarithmic transformation of 1 plus the difference between the IPO year and the founding year of the firm (*Time as Private*). As a major determinant of firms' hiring needs might be their physical expansion and investment in productive capacity, we also include the average amount of capital expenditures made during the relevant horizon as a fraction of the firm's total assets (*Capx/Assets*). Similarly, since employment level in a firm is expected to depend on the amount of M&A activity the firm undertakes, we also include a measure of M&A activity, normalized by the book value of the firm's total assets, over the various time horizons we consider.

An IPO allows the firm to expand its hiring not only through the equity capital raised at the IPO, but also through an easier access to equity and debt capital markets post IPO. To test this conjecture, we include in the even-numbered columns, the average amount of equity and debt capital raised by the firm, normalized by total assets, during the respective time horizon. Finally, in all models in Table 5, we control for aggregate economic conditions at the time of the IPO through year fixed effects.

The relative magnitude of investment capital raised through primary proceeds at the IPO is positively related to employment growth rate during the IPO year but loses its importance once the firm

enters and becomes more established in the public domain, i.e. over longer horizons. The coefficient on *Primary Proceeds* in columns (1) and (2) is positive and statistically significant at the 1% level. Firms raising more capital for investment purposes, rather than merely allowing insiders to cash out, increase substantially the number of their employees and the amount of human capital. Hence, these firms seem to be more important for the process of job creation and growth.

The coefficient of the indicator variable that shows whether the firm is VC-backed is positive, but not statistically significant. Younger firms experience a greater growth rate in employment at the IPO year as well as during the one-, two- and three-year periods following the IPO date. Finally, as expected, we find that firms with greater investment in fixed assets increase employment at a greater rate during the IPO year, as well as in the subsequent post-IPO years, as indicated by the positive and significant coefficient on *Capx/Assets*. The importance of physical capital expansion as a determinant of human capital expansion remains significant in the period from the IPO year to one year after the IPO. Similarly to capital expenditures, acquisition activity is also positively related to employment growth, consistent with the view that part of the employment growth observed in the IPO firms is due to the acquisition activity undertaken by these firms.

Moving to financial constraints, we find a number of interesting results. First, and different from the univariate results, we do not find a very robust evidence that firms in industries with high dependence on external equity financing exhibit a greater increase in employment beyond the IPO year. The coefficient on *High Finance Dependence* is significant only in Column (1) of Panel A. Second, debt capital raised subsequent to the IPO is positively related to the employment growth over the early post-IPO period. This result suggests that an IPO allows the firm to hire both through the use of primary proceeds raised at the IPO and debt capital raised subsequent to the IPO. Third, similar to debt capital raised, equity capital raised at the SEOs subsequent to the IPO is also positively related to the

employment growth at the IPO firms over one and two-year periods following the IPO. This result emphasizes the role of IPO in providing the firm with a continuous access to the public equity markets. In terms of economic magnitude, 1% increase in debt capital raised over the period from the IPO year to one year after the IPO, as a proportion of asset value, is associated with 0.4% increase in the employment growth rate in the same period. 1% increase in equity capital raised over the period from the IPO year to two years after the IPO, as a proportion of pre-IPO asset value, is associated with an increase of around 0.22%, smaller in magnitude when compared to the impact from debt financing. The finding that the economic significance of debt capital is more pronounced than that of equity capital is consistent with the arguments in Pagano et al. (1998), who show that firms going public experience an improvement in their ability to borrow. It is also consistent with the evidence in Celikyurt et al. (2010) that an IPO improves the firm's ability to raise debt financing and to undertake debt-financed acquisition opportunities. In Panel B of Table 4 we include industry fixed effects to control for unobservable heterogeneity across industries, where industry is defined at the 2-digit SIC level. The importance of the amount of investment capital raised at the offering is confirmed by the positive and significant coefficient on *Primary Proceeds* in columns (1) and (2) of Panel B. Our findings with respect to the other determinants of employment growth remain unchanged. Younger firms grow their employment faster during the early post-IPO period, while a presence of VC funding is not that important for post-IPO growth.

In Panel C we investigate the robustness of our results to the inclusion of *pre-IPO* asset growth rates. It can be argued that the employment growth that we find in the IPO year and the period immediately after is the direct result of the growth rate experienced by the firm in the pre-IPO stage and not due to the access of new sources of funding obtained through the IPO decision. The results in Panel C are not consistent with this type of argument: the results documented above, especially the impact of

primary proceeds, equity and debt issues, remain unchanged, and there is no impact on post-IPO employment growth from the pre-IPO asset growth rates.

To obtain a deeper understanding of the mechanisms through which IPO firms increase employment, we include new variables to our multivariate analysis constructed to reflect the improvement in a firm's ability to borrow after it goes public as well as the level of the underpricing a firm experiences at its IPO.

In Panel A of Table 6, we extend our model in Table 5 by including two new variables. The first variable measures the pre-IPO leverage ratio of an IPO firm in our sample (*Debt/Assets (Pre-IPO)*). The second variable is an indicator variable that takes the value of 1 if the change in the firm's *Z-score* from the beginning of the IPO year to the year-end of a given post-IPO year exceeds the 75th percentile of the sample change, and 0 otherwise (*D(ΔZ-score > P75*). Columns (1), (3), (5) and (7) in Table 6 show that firms with a lower leverage ratio pre-IPO experiences a greater increase in employment at the IPO year as well as in the one-, two- and three-year periods following the IPO. To the extent that a lower leverage ratio before the IPO implies a greater degree of financing constraints, these results suggest that going public relaxes the financing constraints, and improves the ability to hire the most for firms which exhibit a greater degree of being financially constrained before going public. Columns (2), (4), (6) and (8) of Table 6, we find that firms which experience the greatest decrease in their default probability increase employment by a greater amount. This result is consistent with IPO firms' improved access to debt capital markets. In addition, it is supportive of the notion that going public may imply a greater supply of labor willing to work at public firms characterized with a lower default probability relative to private firms. We also find that younger IPO firms which experience the greatest decline in the probability of default increase employment most, as suggested by the negative and significant coefficient on the interaction variable between *Time as Private* and *D(ΔZ-score > P75.*

In Panel B of Table 6, we proceed to include a new variable to our multivariate framework based on the change in the cost of debt of a firm after it goes public. Using the RCC variable constructed before, we define a new indicator variable that takes the value of 1 if the change in the firm's *RCC* from the beginning of the IPO year to the year-end of a given post-IPO year is below the 25th percentile of the sample change, and 0 otherwise (*D(ΔRCC < P25)*). Column (1) in Panel C of Table 6 shows that firms with the greatest reduction in their cost of debt in the IPO year exhibits greater employment growth. Similarly, firms which experience the greatest reduction in their cost of debt in the three year period after the IPO have greater employment growth over the first three years after going public. Columns (2) and (4) show that the positive association between the reduction in cost of debt after going public and employment is stronger for firms with a lower leverage ratio before the IPO. This result suggests that going public facilitates employment growth most for firms which had a limited ability to borrow before going public.

Panel C of Table 6 includes an interaction variable to our analysis based on the level of underpricing a firm experiences at its IPO. Specifically, we define an indicator variable that takes the value of 1 if the firm's IPO first-day return exceeds the 75th percentile of the sample first-day returns, and 0 otherwise (*D(Undpr > P75)*). We find that firms in the upper 25th percentile of the sample based on the magnitude of their first-day returns exhibit a greater increase in employment in the IPO year as well as in the one-, two- and three-year periods after the IPO date. We also find that the positive association of underpricing on employment is more pronounced for younger, as reflected by the negative and significant coefficient on the interaction variable between *Time as Private* and *D(Undpr > P75)* in the IPO year and in the two-year period following the IPO date. Similarly, the positive relation between underpricing and employment is greater for firms with greater capital expenditures, as suggested by the

negative and significant coefficient on the interaction variable between *Capx/Assets* and *D(Undpr > P75)*.

3.4 Employment Growth and Firm Performance

Our analysis documents the importance of the IPO stage and first-time access to public equity markets for the employment growth and expansion of firms. Our cross-sectional results suggest that growth-oriented firms and firms dependent on external equity financing increase their human capital at a faster rate during the very early stage of their public life. However, our empirical tests do not offer an insight into whether this faster growth has any implications for firm performance and value. Hence, we explore this aspect of firms' hiring and employment decisions.

We investigate the association between performance and employment growth for our sample of IPO firms. In light of the observed importance of the IPO stage, we follow each firm over a period of five years after its IPO, or until delisting if a delisting event takes place before the end of this period. We consider several measures of firm performance. The first measure, return on assets or *ROA*, is intended to capture accounting performance. It is constructed as operating income before depreciation (OIBDP) scaled by total assets (AT). The second measure we consider is *MTB*, i.e. the market to book ratio of firm's assets. Market value of assets is derived as the market value of equity (PRCC_F×CSHO) plus the book value of assets (AT) minus the book value of equity (CEQ) and taxes on balance sheet (TXDB). We also consider industry-adjusted versions of the above-mentioned metrics, *Adj. ROA* and *Adj. MTB*, respectively. To arrive at industry-adjusted metric, we subtract the median of the respective variable for all firms in a given industry during a given year. Industry definitions are based on 2-digit SIC codes.

Our last measure of performance reflects firms' long-term survival as publicly-traded company. Specifically, we track on CRSP the exchange listing status of each sample firm and create an indicator,

Delisting, that takes the value of 1 if a firm is delisted for performance related reason during a given year and 0 otherwise. We classify a delisting as performance-related if the delisting code provided by CRSP is between 400 and 610.

We examine the association between these measures of performance and IPO firm's employment decisions, captured through the annual growth in the number of their employees. Specifically, *Growth Rate (E)* is constructed as negative 1 plus the ratio of the number of employees (EMP) of the firm at the end of the year to the number of employees at the end of the previous year. In addition to human capital growth and employment decisions, other firm characteristics are also associated with firm performance and survival. Therefore, we include a set of controls in our empirical models.

We control for firm's investment in fixed assets and physical capacity through acquisitions and capital expenditure. Specifically, we introduce *Acq/Assets* and *Capx/Assets* to capture the amounts spent by a firm on acquisitions (AQC) and capital expenditures (CAPX), respectively, as a fraction of total assets (AT). We also control for R&D spending. *RD/Assets* is the ratio of a firm's R&D expenditures (XRD) to its total assets (AT). XRD is replaced with 0 if missing. We also include firm size, measured through the natural logarithm of total assets (AT). As the amount of debt in a firm's capital structure could be relevant for performance, we add two leverage measures. *LT Debt/Assets*, constructed as the ratio of total long-term debt (DLTT) to total assets (AT), captures long-term debt. Short-term debt is measured by *SR Debt/Assets*, constructed as the ratio of debt in current liabilities (DLC) to total assets (AT). We also control for financial strength by introducing the index of financial constraints by Kaplan and Zingales (1997). As in Lamont et al. (2001), the *KZ Index* is the sum of (-1.001909)×((IB+DP)/AT), 3.13919×(DLTT/AT), 0.282639×((AT–CEQ–TXDB+PRCC_F×CSHO)/(AT)), (-1.314759)×(CHE/AT), and (-39.3678)×((DVP+DVC+PRSTKC)/AT).

Using our sample of IPO firms, we construct a panel by following each firm through its first five post-IPO years, or until delisting, and estimate regressions in which the dependent variable is one of our performance measures. We estimate ordinary least squares (OLS) regressions when examining *ROA* and *MTB*, or their industry-adjusted counterparts, and logistic regression for *Delisting*. In addition to the controls discussed above, we also augment the specifications by several offering-specific characteristics defined previously (*Primary Proceeds*, *VC-Backed*, *High Equity Dependence*, *Time as Private*). Lastly, to control for life-cycle effects and aggregate macroeconomic conditions, we include *Post-IPO Year*, the difference between the current year and the year of the firm's IPO, and calendar year fixed effects. Our models are estimated with standard errors clustered at the firm level.

[Insert Table 7]

Table 7 reports the results of our regression analysis. In columns (1) through (4) of the table, the independent variables are contemporaneous to the dependent variable, while in columns (5) through (9) the independent variables are lagged by a period. Employment growth through the IPO year and the five years following the IPO is positively related to contemporaneous operating performance and industry-adjusted operating performance of the firm at the 5% significance level. Employment growth is also positively related to Market to Book ratio and its industry-adjusted counterpart at the 1% level. In order to offer some insight into the economic magnitudes of our estimates, consider the following: Based on the estimates in column (1) of the table, we calculate that if the annual employment growth rate of a firm increases from the 25th to the 75th percentile of its empirical distribution, all else equal, the annual ROA of the firm is 1.44% higher. The effect is substantial if compared to the median annual ROA of 10.34%. Similarly, based on the estimates reported in column (3), we can infer that if the annual employment growth rate of a firm increases from the 25th to the 75th percentile, the Market to Book ratio goes up by .25, compared to median of 1.62. Our analysis also shows that employment growth is negatively related

to the delisting probability of a firm at the 1% level. Economically, the annual delisting probability, which has a mean of .54%, drops from .24% to .14% if the employment growth rate of a firm increases from the 25th to the 75th percentile.

Overall, these findings suggest that employment growth and investment in human capital are positively associated with firm performance, in terms of both accounting and market-based measures, and survival likelihood. IPO firms with greater employment growth are more likely to survive as public firms as well as exhibit superior operating and stock market performance.

4. Conclusions

Going public represents one of the most significant steps in a firm's lifecycle as it enables firms to raise capital they need to invest and hire new employees. Although the existing research in the IPO literature establishes the importance of going public for accessing capital needed for expansion through capital expenditures and M&As, there has been little research on the importance of IPOs for increasing employment and human capital. The potential association between IPOs and employment growth has attracted significant attention from policymakers given the contribution that small and growth-oriented firms in the U.S. economy make towards employment growth.

This paper examines the employment growth of a sample of IPO firms and provides evidence that firms exhibit a significant employment growth around the IPO date. A firm in our sample exists for 16.24 years as a private firm before its IPO on average. During its private life, the average firm hires 112 new employees per year from its founding date to one year before its IPO. By contrast, the creation of new jobs doubles around the IPO. From one year before to one year after its IPO, the average firm in our sample adds 238 new employees per year. Our sample firms have 1,530 employees before their IPO on average, and exhibit 31% increase in employment in the two-year period around the IPO. This highlights

the importance of the IPO event and access to the public equity market for job creation by U.S. firms. The most likely channel through which the association between IPO and employment growth arises is the relaxation of firm's financial constraints through gaining access to capital markets. Specifically we find that firms that experience the largest reduction in the cost of capital following an IPO and those that experience the largest increase in the amount of debt that they issue are precisely those firms that experience the largest increase in employment growth after the IPO.

We also examine the relation between the IPO firms' employment growth and their performance, value, and survival after the IPO. We find that employment growth is positively related to operating performance, firm value and post-IPO survival prospects. Hence, IPO firms with greater human capital investment exhibit superior performance and greater survival probability as public firms.

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Table 1: Time-series Distribution of IPOs and Firm Characteristics

The table reports summary statistics for the sample of firms that went public during 1980-2010 and have data on employment growth during their IPO year. For each variable, the table reports means for all firms with IPO in the calendar year. *All IPOs* is the number of firms going public in that year. *IPOs with EMP* is the number of IPO firms with data to calculate employment growth rate around the IPO. *VC-Backed* is an indicator variable that takes the value of 1 if an IPO is backed by a VC. *Primary Proceeds* is the ratio of primary shares to the sum of primary and secondary shares raised in the offering. *IPO Financing* is an indicator variable that takes the value of 1 if an offering has above-median *Primary Proceeds*. *Time as Private* is the difference between a firm's founding year and its IPO year. *Long Time as Private* is an indicator variable that takes the value of 1 if a firm has above-median *Time as Private*. *High Equity Dependence* is an indicator variable that takes the value of 1 if a firm operates in a sector (2-digit SIC code) with above-median external equity dependence. *Growth Rate IPO Year* is the annual employment growth rate for a firm during its IPO year. *High Growth (Assets)* is an indicator variable that takes the value of 1 if a firm operates in a sector (2-digit SIC code) with above-median aggregate assets growth. *High Growth (Sales)* is an indicator variable that takes the value of 1 if a firm operates in a sector (2-digit SIC code) with above-median aggregate sales growth. Aggregate sales / assets growth and external equity dependence are calculated using all Compustat firms during 1980-2010.

Table 1 continued.

Year	All IPOs	IPOs with EMP	VC-Backed	Primary Proceeds	High Proceeds	Time as Private	Long Time Private	High Equity Dependence	Growth Rate IPO Year	High Growth (Assets)	High Growth (Sales)
1980	91	17	0.41	0.78	0.41	14.64	0.57	0.65	0.32	0.59	0.65
1981	230	85	0.36	0.80	0.39	13.96	0.59	0.81	0.38	0.66	0.73
1982	85	65	0.38	0.82	0.45	9.13	0.44	0.80	0.38	0.68	0.80
1983	466	136	0.39	0.76	0.35	11.76	0.54	0.82	0.44	0.63	0.79
1984	210	162	0.31	0.74	0.33	12.75	0.54	0.75	0.38	0.65	0.77
1985	231	68	0.34	0.82	0.43	10.97	0.47	0.74	0.43	0.57	0.69
1986	471	151	0.26	0.81	0.49	20.44	0.57	0.66	0.34	0.53	0.62
1987	347	180	0.28	0.83	0.49	18.05	0.49	0.63	0.36	0.53	0.60
1988	141	83	0.31	0.84	0.49	18.19	0.48	0.67	0.46	0.59	0.63
1989	123	47	0.32	0.86	0.55	16.36	0.49	0.66	0.35	0.47	0.68
1990	127	73	0.36	0.87	0.48	15.13	0.55	0.74	0.43	0.62	0.75
1991	279	97	0.49	0.84	0.56	17.02	0.61	0.73	0.29	0.59	0.70
1992	398	222	0.47	0.88	0.64	19.64	0.59	0.76	0.32	0.57	0.73
1993	552	232	0.41	0.88	0.63	18.35	0.56	0.71	0.36	0.60	0.66
1994	436	216	0.35	0.89	0.61	14.09	0.50	0.67	0.43	0.52	0.56
1995	447	170	0.50	0.87	0.56	14.76	0.52	0.76	0.43	0.62	0.72
1996	658	278	0.48	0.89	0.60	14.08	0.47	0.81	0.57	0.69	0.78
1997	471	209	0.34	0.90	0.64	16.60	0.58	0.81	0.54	0.66	0.73
1998	302	191	0.28	0.89	0.68	15.62	0.53	0.78	0.49	0.66	0.73
1999	455	160	0.49	0.93	0.73	12.61	0.37	0.91	0.81	0.84	0.84
2000	334	200	0.71	0.98	0.93	9.60	0.36	0.96	0.72	0.84	0.96
2001	70	56	0.50	0.96	0.91	22.11	0.61	0.89	0.31	0.71	0.82
2002	69	42	0.33	0.89	0.64	20.07	0.61	0.83	0.22	0.76	0.81
2003	75	23	0.43	0.79	0.43	26.39	0.70	0.83	0.34	0.78	0.78
2004	196	119	0.52	0.87	0.68	16.21	0.59	0.84	0.28	0.56	0.70
2005	175	111	0.24	0.83	0.60	30.26	0.69	0.81	0.22	0.66	0.66
2006	158	83	0.39	0.85	0.55	22.50	0.73	0.81	0.22	0.61	0.73
2007	169	82	0.45	0.87	0.59	15.43	0.62	0.85	0.38	0.68	0.85
2008	25	25	0.48	0.84	0.60	24.36	0.86	0.88	0.25	0.68	0.72
2009	49	12	0.58	0.64	0.33	33.55	0.73	0.83	0.20	0.75	0.75
2010	113	62	0.31	0.81	0.55	16.68	0.52	0.84	0.21	0.61	0.65
All	7,953	3,657	0.40	0.86	0.59	16.24	0.53	0.78	0.43	0.64	0.73

Table 2: Cross-sectional Determinants of Employment Growth

The table reports mean and median changes in log of firm's total employment for various sub-samples and over various post-IPO horizons. *ΔLog(EMP) Year 0* is the change in log of total employment from the beginning of the IPO year to the end of the IPO year. *ΔLog(EMP) Year 0-1* is the change in log of total employment from the beginning of the IPO year to the end of the first post-IPO year. *ΔLog(EMP) Year 0-2* is the change in log of total employment from the beginning of the IPO year to the end of the second post-IPO year. *ΔLog(EMP) Year 0-3* is the change in log of total employment from the beginning of the IPO year to the end of the third post-IPO year. *Equity Dependence* measures the external equity dependence of the firm's industry. Industries with above-median (below-median) equity dependence are categorized as *High* (*Low*). *Acquisition Activity* is the sum of the acquisition expenditures made by the firm during the relevant period. Firms with (without) positive acquisition expenditures are categorized as *Yes* (*No*). *High Growth (Assets)* is an indicator variable that takes the value of 1 for industries with above-median growth based on total assets, and 0 otherwise. Firms in industries with above-median (below-median) assets growth are categorized as *Yes* (*No*). *Log(Primary Proceeds)* is the natural logarithm of 1 + the amount of primary proceeds raised in the offering, scaled by the book value of the firm's pre-IPO total assets. Firm with above-median (below-median) amount of primary proceeds are categorized as *High* (*Low*). *Age at IPO* is the number of years between the founding year of the firm and its IPO year. Firms with above-median (below-median) age are categorized as *High* (*Low*). *VC-Backed* is an indicator that takes the value of 1 if the firm is backed by VC (*Yes*), and 0 otherwise (*No*). IPO *Underpricing* is the first-day return defined as the closing price on the first trading day divided by the offer price minus 1. IPOs with above-median (below-median) first-day return have *High* (*Low*) *IPO Underprice*. ΔRCC is defined as the change in *RCC* from the beginning of the IPO year to the end of the respective post-IPO year as outlined in the construction of *ΔLog(EMP) Year 0-X*. Firms with above-median (below-median) change in RCC are categorized as *High* (*Low*). RCC is defined as 1 plus the cost of debt for the IPO firm, scaled by 1 plus the median cost of debt for all Compustat firms for that calendar year. Cost of debt is captured by the ratio of total interest expense (XINT) to total long-term and short-term debt (DLTT + DLC). *ΔZ-score* is the change in the firm's Z-score from the beginning of the IPO year to the end of the respective post-IPO year as outlined in the construction of *ΔLog(EMP) Year 0-X*. Firms with above-median (below-median) change in Z-score are categorized as *High* (*Low*). Z-score is constructed as the sum of the following: 3.3×(Earnings before Interest and Tax (EBIT) / Total Assets (AT)), 1.4×(Retained Earnings (RE) / Total Assets(AT)), 1.2×(Net Working Capital (WCAP) / Total Assets (AT)), 1×(Sales (SALE) / Total Assets (AT). The *p-values* are from t-tests for the Mean columns and Wilcoxon tests for the Median columns.

Table 2 continued.

		ΔLog(EMP) Year 0		ΔLog(EMP) Year 0-1		ΔLog(EMP) Year 0-2		ΔLog(EMP) Year 0-3	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median
Equity Dependence	Low	0.23	0.14	0.43	0.31	0.57	0.46	0.66	0.54
	High	0.32	0.24	0.53	0.44	0.62	0.54	0.67	0.61
	p-value	0.00	0.00	0.00	0.00	0.07	0.02	0.73	0.14
ΔRCC	Low	0.28	0.19	0.49	0.38	0.62	0.51	0.70	0.57
	High	0.28	0.21	0.45	0.36	0.55	0.49	0.60	0.54
	p-value	0.79	0.45	0.06	0.07	0.02	0.02	0.01	0.06
Acquisition Activity	No	0.27	0.20	0.43	0.34	0.50	0.43	0.53	0.48
	Yes	0.37	0.26	0.61	0.49	0.71	0.60	0.78	0.69
	p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High Growth (Assets)	No	0.25	0.17	0.45	0.34	0.56	0.47	0.63	0.53
	Yes	0.33	0.25	0.54	0.45	0.64	0.55	0.70	0.63
	p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.01
Log(Primary Proceeds)	Low	0.20	0.14	0.37	0.29	0.48	0.42	0.54	0.48
	High	0.43	0.35	0.67	0.60	0.76	0.69	0.84	0.80
	p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Age at IPO	Low	0.41	0.33	0.64	0.56	0.74	0.67	0.81	0.76
	High	0.22	0.16	0.40	0.32	0.50	0.44	0.57	0.50
	p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VC-Backed	No	0.27	0.18	0.47	0.35	0.57	0.47	0.62	0.53
	Yes	0.35	0.28	0.57	0.51	0.67	0.60	0.74	0.70
	p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IPO Underpricing	Low	0.24	0.17	0.42	0.30	0.52	0.43	0.57	0.49
	High	0.36	0.27	0.59	0.50	0.69	0.60	0.76	0.70
	p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ΔZ-score	Low	0.30	0.22	0.48	0.42	0.55	0.50	0.59	0.55
	High	0.33	0.24	0.55	0.43	0.69	0.56	0.80	0.67
	p-value	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
All IPOs	All	0.30	0.22	0.51	0.41	0.61	0.51	0.67	0.59

Table 3: Evolution of Employment Growth Around and After IPO

The table reports the average change in log of firm's total employment (EMP) for various sub-samples for different years relative to firm's IPO. *Year (T)* is an indicator variable that takes the value of 1 during the T^{th} post-IPO year of a firm, and 0 otherwise. Single-year changes in the log of firm's total employment are considered for years between (-2) and (+3), i.e. from two years pre-IPO to three years post-IPO. For years beyond the 3rd post-IPO year, we consider year-bins. For each bin, we take the average annual change in log of firm's total employment for each firm across all year within this bin. *Equity Dependence* measures the external equity dependence of the firm's industry. Industries with above-median (below-median) equity dependence are categorized as *High* (*Low*). *VC-Backed* is an indicator that takes the value of 1 if the firm is backed by VC (*Yes*), and 0 otherwise (*No*). *Log(Primary Proceeds)* is the natural logarithm of 1 + the amount of primary proceeds raised in the offering, scaled by the book value of the firm's pre-IPO total assets. Firm with above-median (below-median) amount of primary proceeds are categorized as *High* (*Low*). *High Growth (Assets)* is an indicator variable that takes the value of 1 for industries with above-median growth based on total assets, and 0 otherwise. Firms in industries with above-median (below-median) assets growth are categorized as *Yes* (*No*). *Age at IPO* is the number of years between the founding year of the firm and its IPO year. Firms with above-median (below-median) age are categorized as *High* (*Low*).

Table 3 continued.

	All IPOs	Equity Dependence		VC-Backed		Log(Primary Proceeds)		High Growth (Assets)		Age at IPO	
		High	Low	Yes	No	High	Low	Yes	No	High	Low
Year (-2)	0.05*	0.08**	0.01	0.05	0.05	0.06	0.05*	0.09**	0.02	0.04	0.11
	(0.03)	(0.04)	(0.04)	(0.07)	(0.03)	(0.14)	(0.03)	(0.05)	(0.04)	(0.03)	(0.11)
Year (-1)	0.21***	0.24***	0.13***	0.40***	0.13***	0.48***	0.11***	0.25***	0.15***	0.13***	0.44***
	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.04)	(0.02)	(0.02)	(0.03)	(0.02)	(0.04)
Year (0)	0.29***	0.31***	0.22***	0.34***	0.26***	0.42***	0.19***	0.32***	0.24***	0.21***	0.39***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Year (+1)	0.23***	0.23***	0.21***	0.25***	0.22***	0.27***	0.19***	0.23***	0.22***	0.19***	0.27***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Year (+2)	0.10***	0.10***	0.11***	0.10***	0.10***	0.09***	0.12***	0.10***	0.10***	0.10***	0.10***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Year (+3)	0.07***	0.07***	0.08***	0.07***	0.07***	0.07***	0.08***	0.07***	0.07***	0.07***	0.07***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Year (+4 to +10)	0.02***	0.02***	0.03***	0.03***	0.02***	0.03***	0.02***	0.03***	0.01	0.02***	0.02**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Year (+11 to +20)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02**	-0.01	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Year (+21 to +30)	-0.01	0.01	-0.03	-0.01	-0.01	-0.01	-0.01	0.02	-0.04*	0.01	-0.01
	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)
N	29,729	23,219	6,510	11,085	18,644	15,908	16,800	18,748	10,981	14,451	13,391
R-square	0.082	0.088	0.064	0.104	0.071	0.117	0.055	0.086	0.076	0.069	0.109

Table 4: Descriptive Statistics

The table reports summary statistics for the multivariate analysis of the change in firm employment over different horizons relative to the firm's IPO year. *Δlog(EMP)* is the change in log of total employment (EMP) from the beginning of the IPO year to the end of the respective year. For period "*Year 0*", *Δlog(EMP)* is the change in log of total employment from the beginning of the IPO year to the end of the IPO year. For period "*Year 0-1*", *Δlog(EMP)* is the change in log of total employment from the beginning of the IPO year to the end of the first post-IPO year. For period "*Year 0-2*", *Δlog(EMP)* is the change in log of total employment from the beginning of the IPO year to the end of the second post-IPO year. Lastly, for period "*Year 0-3*", *Δlog(EMP)* is the change in log of total employment from the beginning of the IPO year to the end of the third post-IPO year. *Capx/Assets* measures the capital expenditures made by the firm during the relevant time horizon scaled by the book value of the firm's pre-IPO total assets. For period "Year 0", *Capx/Assets* is the capital expenditures (CAPX) made by the firm during the IPO year scaled by the book value of the firm's pre-IPO total assets (AT). For period "Year 0-1", *Capx/Assets* is the sum of the capital expenditures made by the firm during the IPO year and the first post-IPO year, scaled by the book value of the firm's pre-IPO total assets. For period "Year 0-2", *Capx/Assets* is the sum of the capital expenditures made by the firm during the IPO year, the first post-IPO year, and the second post-IPO year, scaled by the book value of the firm's pre-IPO total assets. For period "Year 0-3", *Capx/Assets* is the sum of the capital expenditures made by the firm during the IPO year, the first post-IPO year, the second post-IPO year, and the third post-IPO year scaled by the book value of the firm's pre-IPO total assets. The construction of *Acquisitions/Assets* is similar to that of *Capx/Assets* but uses acquisition expenditures (AQC) instead. *Net Debt Issue/Assets* and *Net Equity Issue/Assets* measure the debt and equity financing raised by the firm during the respective period, scaled by the book value of the firm's pre-IPO total assets. The construction of the variables follows that of *Capx/Assets* but uses *Net Debt Issue* and *Net Equity Issue*, respectively. *Net Debt Issue* is defined as the issuance of long-term debt (DLTIS) minus retirement of long-term debt (DLTR), while *Net Equity Issue* is defined as the sale of common and preferred stock (SSTK) minus purchase of common and preferred stock (PRSTKC). *Log(Primary Proceeds)* is the natural logarithm of 1 + the amount of primary proceeds raised in the offering, scaled by the book value of the firm's pre-IPO total assets. *Time as Private* is the natural logarithm of 1 + the number of years between the founding year of the firm and its IPO year. *VC-Backed* is an indicator that takes the value of 1 if the firm is backed by VC, and 0 otherwise. Accounting variables are winsorized at the 1st and 99th percentile.

Table 4 continued.

Period	Variable	25th Perc	Median	75th Perc	Mean	SD	N
Year 0	Δlog(EMP)	0.07	0.22	0.44	0.30	0.35	3,654
	Capx/Assets	0.05	0.11	0.27	0.24	0.39	3,611
	Acquisitions/Assets	0.00	0.00	0.00	0.09	0.34	3,525
	Net Equity Issue/Assets	0.29	0.75	1.84	2.05	4.85	3,144
	Net Debt Issue/Assets	-0.14	-0.01	0.00	0.00	0.49	3,458
	Log(Primary Proceeds)	0.29	0.60	1.07	0.77	0.65	3,654
Year 0-1	Δlog(EMP)	0.15	0.41	0.76	0.51	0.56	3,371
	Capx/Assets	0.12	0.28	0.64	0.62	1.11	3,339
	Acquisitions/Assets	0.00	0.00	0.11	0.24	0.83	3,329
	Net Equity Issue/Assets	0.27	0.78	2.05	2.36	5.89	3,125
	Net Debt Issue/Assets	-0.12	0.00	0.13	0.23	1.25	3,287
	Log(Primary Proceeds)	0.30	0.60	1.05	0.77	0.65	3,371
Year 0-2	Δlog(EMP)	0.18	0.51	0.97	0.61	0.72	3,069
	Capx/Assets	0.20	0.46	1.03	1.04	2.06	3,043
	Acquisitions/Assets	0.00	0.00	0.25	0.43	1.38	3,047
	Net Equity Issue/Assets	0.28	0.86	2.49	2.93	7.45	2,912
	Net Debt Issue/Assets	-0.10	0.00	0.32	0.52	2.24	3,028
	Log(Primary Proceeds)	0.30	0.61	1.04	0.77	0.65	3,069
Year 0-3	Δlog(EMP)	0.17	0.59	1.13	0.67	0.85	2,751
	Capx/Assets	0.28	0.63	1.49	1.45	2.76	2,729
	Acquisitions/Assets	0.00	0.01	0.41	0.66	2.05	2,736
	Net Equity Issue/Assets	0.29	0.90	2.71	3.34	8.78	2,648
	Net Debt Issue/Assets	-0.10	0.00	0.49	0.81	3.10	2,728
	Log(Primary Proceeds)	0.30	0.60	1.03	0.76	0.64	2,751

Table 5: IPO Decision and Employment Growth

The table reports results of cross-sectional regressions of change in total employment over different horizons relative to the firm's IPO. The dependent variable in each column is the change in log of total employment (EMP) from the beginning of the IPO year to the end of the respective year. The specification shown in Panel A does not include industry fixed effects since it includes industry-specification measure of financial constraints (High Finance Dependence). The specification in Panels B and C include industry fixed effects. In columns (1) and (2), the change is from the beginning of the IPO year to the end of the IPO year. In columns (3) and (4), the change is from the beginning of the IPO year to the end of the first post-IPO year. In columns (5) and (6), the change is from the beginning of the IPO year to the end of the second post-IPO year. In columns (7) and (8), the change is from the beginning of the IPO year to the end of the third post-IPO year. *High Finance Dependence* is an indicator variable takes the value of 1 if the firm operates in an industry with high dependence on external equity, and 0 otherwise. *Log(Primary Proceeds)* is the natural logarithm of 1 + the amount of primary proceeds raised in the offering, scaled by the book value of the firm's pre-IPO total assets. *VC-Backed* is an indicator that takes the value of 1 if the firm is backed by VC, and 0 otherwise. *Time as Private* is the natural logarithm of 1 + the number of years between the founding year of the firm and its IPO year. *Capx/Assets* measures the capital expenditures made by the firm during the relevant time horizon scaled by the book value of the firm's pre-IPO total assets. Specifically, in columns (1) and (2), *Capx/Assets* is the capital expenditures (CAPX) made by the firm during the IPO year scaled by the book value of the firm's pre-IPO total assets (AT). In columns (3) and (4), *Capx/Assets* is the sum of the capital expenditures made by the firm during the IPO year and the first post-IPO year, scaled by the book value of the firm's pre-IPO total assets. In columns (5) and (6), *Capx/Assets* is the sum of the capital expenditures made by the firm during the IPO year, the first post-IPO year, and the second post-IPO year, scaled by the book value of the firm's pre-IPO total assets. In columns (7) and (8), *Capx/Assets* is the sum of the capital expenditures made by the firm during the IPO year, the first post-IPO year, the second post-IPO year, and the third post-IPO year scaled by the book value of the firm's pre-IPO total assets. The construction of *Acquisitions/Assets* is similar to that of *Capx/Assets* but uses acquisition expenditures (AQC) instead. *Net Debt Issue/Assets* and *Net Equity Issue/Assets* measure the debt and equity financing raised by the firm during the respective period, scaled by the book value of the firm's pre-IPO total assets. The construction of the variables follows that of *Capx/Assets* but uses *Net Debt Issue* and *Net Equity Issue*, respectively. *Net Debt Issue* is defined as the issuance of long-term debt (DLTIS) minus retirement of long-term debt (DLTR), while *Net Equity Issue* is defined as the sale of common and preferred stock (SSTK) minus purchase of common and preferred stock (PRSTKC). *Pre-IPO Asset Growth* is the growth rate in the firm's total assets during the pre-IPO year. Specifically, the variable is measured as negative 1 + the ratio of the book value of the firm's total assets at the beginning of the IPO year to the book value of the firm's total assets at the beginning of the pre-IPO year. Accounting variables are winsorized at the 1st and 99th percentile. Industry FE are defined at the 2-digit SIC level.

Table 5 continued.
Panel A – No Industry Fixed Effects and with Industry-level Financial Constraints

	ΔLog(EMP) Year 0		ΔLog(EMP) Year 0-1		ΔLog(EMP) Year 0-2		ΔLog(EMP) Year 0-3	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
High Finance Dependence	0.029**	0.003	0.031	-0.003	0.033	-0.016	0.026	-0.044
	(0.024)	(0.837)	(0.126)	(0.906)	(0.228)	(0.585)	(0.437)	(0.222)
Log(Primary Proceeds)	0.111***	0.168***	0.082***	0.132***	-0.017	-0.012	-0.058*	-0.043
	(0.001)	(0.001)	(0.001)	(0.001)	(0.531)	(0.758)	(0.082)	(0.327)
VC-Backed	0.018	0.011	0.047**	0.016	0.075***	0.049*	0.080**	0.067*
	(0.106)	(0.983)	(0.011)	(0.454)	(0.003)	(0.083)	(0.012)	(0.056)
Time as Private	-0.046***	-0.052***	-0.073***	-0.083***	-0.085***	-0.101***	-0.072***	-0.096***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Capx/Assets	0.198***		0.131***		0.116***		0.117***	
	(0.001)		(0.001)		(0.001)		(0.001)	
Acquisitions/Assets	0.215***		0.149***		0.106***		0.083***	
	(0.001)		(0.001)		(0.001)		(0.001)	
Net Debt Issue/Assets		0.098***		0.091***		0.073***		0.064***
		(0.001)		(0.001)		(0.001)		(0.001)
Net Equity Issue/Assets		0.002		0.011***		0.019***		0.021***
		(0.512)		(0.007)		(0.001)		(0.001)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	No	No	No	No	No	No
N	3,352	2,855	3,160	2,921	2,895	2,754	2,600	2,513
R-square	0.602	0.564	0.604	0.568	0.569	0.530	0.555	0.500

Table 5 continued.
Panel B – Industry Fixed Effects

	ΔLog(EMP) Year 0		ΔLog(EMP) Year 0-1		ΔLog(EMP) Year 0-2		ΔLog(EMP) Year 0-3	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log(Primary Proceeds)	0.126***	0.186***	0.107***	0.162***	0.008	0.021	-0.044	-0.017
	(0.001)	(0.001)	(0.001)	(0.001)	(0.778)	(0.613)	(0.223)	(0.706)
VC-Backed	0.031***	0.017	0.068***	0.039*	0.095***	0.074**	0.088***	0.085**
	(0.008)	(0.212)	(0.001)	(0.069)	(0.001)	(0.011)	(0.007)	(0.019)
Time as Private	-0.043***	-0.043***	-0.067***	-0.073***	-0.083***	-0.093***	-0.073***	-0.09***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Capx/Assets	0.196***		0.128***		0.114***		0.117***	
	(0.001)		(0.001)		(0.001)		(0.001)	
Acquisitions/Assets	0.208***		0.142***		0.102***		0.083***	
	(0.001)		(0.001)		(0.001)		(0.001)	
Net Debt Issue/Assets		0.093***		0.081***		0.067***		0.061***
		(0.001)		(0.001)		(0.001)		(0.001)
Net Equity Issue/Assets		0.002		0.011***		0.021***		0.020***
		(0.573)		(0.008)		(0.001)		(0.001)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3,352	2,855	3,160	2,921	2,895	2,754	2,600	2,513
R-square	0.618	0.587	0.621	0.591	0.586	0.554	0.571	0.521

Table 5 continued.
Panel C – Industry Fixed Effects and Pre-IPO growth

	ΔLog(EMP) Year 0		ΔLog(EMP) Year 0-1		ΔLog(EMP) Year 0-2		ΔLog(EMP) Year 0-3	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log(Primary Proceeds)	0.134***	0.087**	0.079**	0.110**	-0.056	-0.054	-0.056	-0.058
	(0.001)	(0.016)	(0.027)	(0.034)	(0.257)	(0.437)	(0.382)	(0.517)
VC-Backed	0.017	0.007	0.069*	0.041	0.068	0.061	0.056	0.073
	(0.414)	(0.791)	(0.064)	(0.319)	(0.144)	(0.268)	(0.347)	(0.298)
Time as Private	-0.042***	-0.049***	-0.060***	-0.077***	-0.054**	-0.059**	-0.025	-0.041
	(0.001)	(0.001)	(0.001)	(0.001)	(0.019)	(0.013)	(0.389)	(0.209)
Pre-IPO Asset Growth	0.003	0.005	-0.006*	-0.008**	-0.007	-0.010*	-0.007	-0.011
	(0.208)	(0.111)	(0.091)	(0.034)	(0.128)	(0.051)	(0.334)	(0.148)
Capx/Assets	0.206***		0.188***		0.162***		0.135***	
	(0.001)		(0.001)		(0.001)		(0.001)	
Acquisitions/Assets	0.205***		0.152***		0.110***		0.098***	
	(0.001)		(0.001)		(0.001)		(0.001)	
Net Debt Issue/Assets		0.089***		0.080***		0.078***		0.060***
		(0.010)		(0.001)		(0.001)		(0.001)
Net Equity Issue/Assets		0.016***		0.023***		0.033***		0.034***
		(0.004)		(0.001)		(0.001)		(0.001)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1,268	997	1,123	994	1,009	934	876	828
R-square	0.643	0.618	0.620	0.593	0.581	0.534	0.551	0.474

Table 6: IPO and Employment Growth

The table reports results of cross-sectional regressions of change in total employment over different horizons relative to the firm's IPO. The dependent variable in each column is the change in log of total employment (EMP) from the beginning of the IPO year to the end of the respective year. In columns (1) and (2), the change is from the beginning of the IPO year to the end of the IPO year. In columns (3) and (4), the change is from the beginning of the IPO year to the end of the first post-IPO year. In columns (5) and (6), the change is from the beginning of the IPO year to the end of the second post-IPO year. In columns (7) and (8), the change is from the beginning of the IPO year to the end of the third post-IPO year. *Log(Primary Proceeds)* is the natural logarithm of 1 + the amount of primary proceeds raised in the offering, scaled by the book value of the firm's pre-IPO total assets. *VC-Backed* is an indicator that takes the value of 1 if the firm is backed by VC, and 0 otherwise. *Time as Private* is the natural logarithm of 1 + the number of years between the founding year of the firm and its IPO year. *Capx/Assets* measures the capital expenditures made by the firm during the relevant time horizon scaled by the book value of the firm's pre-IPO total assets. Specifically, in columns (1) and (2), *Capx/Assets* is the capital expenditures (CAPX) made by the firm during the IPO year scaled by the book value of the firm's pre-IPO total assets (AT). In columns (3) and (4), *Capx/Assets* is the sum of the capital expenditures made by the firm during the IPO year and the first post-IPO year, scaled by the book value of the firm's pre-IPO total assets. In columns (5) and (6), *Capx/Assets* is the sum of the capital expenditures made by the firm during the IPO year, the first post-IPO year, and the second post-IPO year, scaled by the book value of the firm's pre-IPO total assets. In columns (7) and (8), *Capx/Assets* is the sum of the capital expenditures made by the firm during the IPO year, the first post-IPO year, the second post-IPO year, and the third post-IPO year scaled by the book value of the firm's pre-IPO total assets. The construction of *Acquisitions/Assets* is similar to that of *Capx/Assets* but uses acquisition expenditures (AQC) instead. *Debt/Assets (Pre-IPO)* is the ratio, as of the beginning of the IPO year, of the firm's total debt (DLTT + DLC) to the book value of its total assets (AT). *D(ΔZ-score > P75)* is an indicator variable that takes the value of 1 if the change in the firm's *Z-score* from the beginning of the IPO year to the year-end of the respective post-IPO year exceeds the 75th percentile of the sample change, and 0 otherwise. *Z-score* is constructed as the sum of the following: 3.3×(Earnings before Interest and Tax (EBIT) / Total Assets (AT)), 1.4×(Retained Earnings (RE) / Total Assets(AT)), 1.2×(Net Working Capital (WCAP) / Total Assets (AT)), 1×(Sales (SALE) / Total Assets (AT). D(ΔRCC < P25) is an indicator variable that takes the value of 1 if the change in the firm's *RCC* from the beginning of the IPO year to the year-end of the respective post-IPO year is below the 25th percentile of the sample change, and 0 otherwise. *RCC* is defined as 1 plus the cost of debt for the firm, scaled by 1 plus the median cost of debt for all Compustat firms for that calendar year. Cost of debt is captured by the ratio of total interest expense (XINT) to total long-term and short-term debt (DLTT + DLC). D(Undpr > P75) is an indicator variable that takes the value of 1 if the firm's IPO first-day return exceeds the 75th percentile of the sample first-day returns, and 0 otherwise. The first-day return is defined as the closing price on the first trading day divided by the offer price minus 1. Accounting variables are winsorized at the 1st and 99th percentile. Industry FE are defined at the 2-digit SIC level.

Table 6 continued.
Panel A – Change in Z-score

	ΔLog(EMP) Year 0		ΔLog(EMP) Year 0-1		ΔLog(EMP) Year 0-2		ΔLog(EMP) Year 0-3	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log(Primary Proceeds)	0.125***	0.141***	0.091***	0.122***	-0.03	-0.055	-0.046	-0.061
	(0.001)	(0.001)	(0.001)	(0.001)	(0.33)	(0.181)	(0.224)	(0.197)
VC-Backed	0.014	0.022*	0.033*	0.031	0.059**	0.056*	0.037	0.025
	(0.252)	(0.093)	(0.094)	(0.143)	(0.027)	(0.059)	(0.269)	(0.51)
Time as Private	-0.041***	-0.032***	-0.056***	-0.043***	-0.084***	-0.059***	-0.078***	-0.052***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.01)
Capx/Assets	0.226***	0.2***	0.152***	0.177***	0.133***	0.166***	0.124***	0.139***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Acquisitions/Assets	0.247***	0.268***	0.162***	0.196***	0.117***	0.128***	0.091***	0.097***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Debt/Assets (Pre-IPO)	-0.067***	-0.061***	-0.19***	-0.127***	-0.218***	-0.191***	-0.236***	-0.237***
	(0.001)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
D(ΔZ-score > P75)	0.034*	0.236***	0.118***	0.393***	0.199***	0.562***	0.25***	0.563***
	(0.051)	(0.005)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log(Primary Proceeds)×D(ΔZ-score > P75)		-0.044		-0.053		0.071		0.074
		(0.141)		(0.203)		(0.202)		(0.259)
VC-Backed×D(ΔZ-score > P75)		-0.024		0.002		-0.007		0.018
		(0.497)		(0.971)		(0.899)		(0.805)
Time as Private×D(ΔZ-score > P75)		-0.075***		-0.066**		-0.15***		-0.142***
		(0.008)		(0.034)		(0.001)		(0.001)
Capx/Assets×D(ΔZ-score > P75)		0.059		-0.052		-0.074***		-0.053**
		(0.256)		(0.161)		(0.004)		(0.019)
Acquisitions/Assets×D(ΔZ-score > P75)		-0.07		-0.082**		-0.045		-0.028
		(0.251)		(0.031)		(0.268)		(0.437)
Debt/Assets (Pre-IPO)×D(ΔZ-score > P75)		-0.007		-0.081		0.002		0.052
		(0.838)		(0.154)		(0.975)		(0.628)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2,963	2,963	2,791	2,791	2,559	2,559	2,300	2,300
R-square	0.639	0.642	0.649	0.654	0.618	0.625	0.609	0.614

Table 6 continued.
Panel B – Change in RCC

	ΔLog(EMP) Year 0		ΔLog(EMP) Year 0-1		ΔLog(EMP) Year 0-2		ΔLog(EMP) Year 0-3	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log(Primary Proceeds)	0.14***	0.114***	0.126***	0.102***	0.033	-0.028	-0.006	-0.033
	(0.001)	(0.001)	(0.001)	(0.001)	(0.354)	(0.463)	(0.902)	(0.478)
VC-Backed	0.037***	0.036**	0.061***	0.049**	0.088***	0.097***	0.07*	0.057
	(0.005)	(0.012)	(0.004)	(0.034)	(0.003)	(0.004)	(0.063)	(0.186)
Time as Private	-0.035***	-0.041***	-0.052***	-0.06***	-0.072***	-0.065***	-0.062***	-0.055***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.005)
Capx/Assets	0.17***	0.19***	0.133***	0.151***	0.114***	0.135***	0.119***	0.121***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Acquisitions/Assets	0.223***	0.237***	0.164***	0.162***	0.12***	0.096***	0.086***	0.076***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Debt/Assets (Pre-IPO)	-0.037**	-0.055***	-0.142***	-0.201***	-0.166***	-0.181***	-0.185***	-0.248***
	(0.049)	(0.005)	(0.001)	(0.001)	(0.002)	(0.004)	(0.007)	(0.002)
D(ΔRCC < P25)	0.038***	-0.117**	0.029	-0.178**	0.113***	0.018	0.059	-0.044
	(0.009)	(0.028)	(0.219)	(0.045)	(0.001)	(0.889)	(0.115)	(0.802)
Log(Primary Proceeds)×D(ΔRCC < P25)		0.114***		0.091*		0.257***		0.099
		(0.002)		(0.091)		(0.001)		(0.336)
VC-Backed×D(ΔRCC < P25)		0.005		0.049		-0.035		0.039
		(0.883)		(0.322)		(0.589)		(0.659)
Time as Private×D(ΔRCC < P25)		0.023		0.027		-0.028		-0.035
		(0.139)		(0.262)		(0.392)		(0.443)
Capx/Assets×D(ΔRCC < P25)		-0.06		-0.054*		-0.057**		-0.001
		(0.252)		(0.076)		(0.026)		(0.972)
Acquisitions/Assets×D(ΔRCC < P25)		-0.046		-0.009		0.084***		0.033
		(0.501)		(0.828)		(0.01)		(0.197)
Debt/Assets (Pre-IPO)×D(ΔRCC < P25)		0.128**		0.26***		0.048		0.208
		(0.013)		(0.001)		(0.675)		(0.134)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2,490	2,490	2,312	2,312	2,065	2,065	1,875	1,875
R-square	0.612	0.616	0.634	0.639	0.615	0.624	0.593	0.596

Table 6 continued.
Panel C – Underpricing

	ΔLog(EMP) Year 0		ΔLog(EMP) Year 0-1		ΔLog(EMP) Year 0-2		ΔLog(EMP) Year 0-3	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log(Primary Proceeds)	0.123***	0.133***	0.109***	0.132***	0.01	0.046	-0.041	-0.023
	(0.001)	(0.001)	(0.001)	(0.001)	(0.743)	(0.189)	(0.256)	(0.597)
VC-Backed	0.024**	0.022*	0.052***	0.038*	0.075***	0.076***	0.07**	0.05
	(0.041)	(0.089)	(0.006)	(0.078)	(0.003)	(0.009)	(0.029)	(0.179)
Time as Private	-0.04***	-0.032***	-0.061***	-0.054***	-0.078***	-0.066***	-0.067***	-0.062***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Capx/Assets	0.195***	0.165***	0.129***	0.103***	0.113***	0.096***	0.115***	0.111***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Acquisitions/Assets	0.212***	0.227***	0.147***	0.165***	0.106***	0.118***	0.084***	0.089***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Debt/Assets (Pre-IPO)	-0.043***	-0.05***	-0.134***	-0.147***	-0.158***	-0.176***	-0.16***	-0.179***
	(0.007)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.004)	(0.006)
D(Undpr > P75)	0.074***	0.175***	0.106***	0.186*	0.125***	0.325**	0.123***	0.181
	(0.001)	(0.004)	(0.001)	(0.054)	(0.001)	(0.013)	(0.001)	(0.249)
Log(Primary Proceeds)×D(Undpr > P75)		-0.038		-0.07*		-0.102*		-0.056
		(0.164)		(0.098)		(0.075)		(0.413)
VC-Backed ×D(Undpr > P75)		0.007		0.052		-0.016		0.077
		(0.813)		(0.223)		(0.78)		(0.282)
Time as Private×D(Undpr > P75)		-0.046**		-0.044		-0.072**		-0.033
		(0.012)		(0.102)		(0.045)		(0.442)
Capx/Assets×D(Undpr > P75)		0.089*		0.066**		0.04*		0.01
		(0.068)		(0.045)		(0.052)		(0.535)
Acquisitions/Assets×D(Undpr > P75)		-0.046		-0.052		-0.038		-0.017
		(0.438)		(0.214)		(0.274)		(0.538)
Debt/Assets (Pre-IPO)×D(Undpr > P75)		0.035		0.065		0.089		0.08
		(0.382)		(0.295)		(0.326)		(0.48)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3,336	3,336	3,145	3,145	2,883	2,883	2,591	2,591
R-square	0.624	0.627	0.628	0.631	0.592	0.595	0.575	0.576

Table 7: Employment Growth and Firm Performance

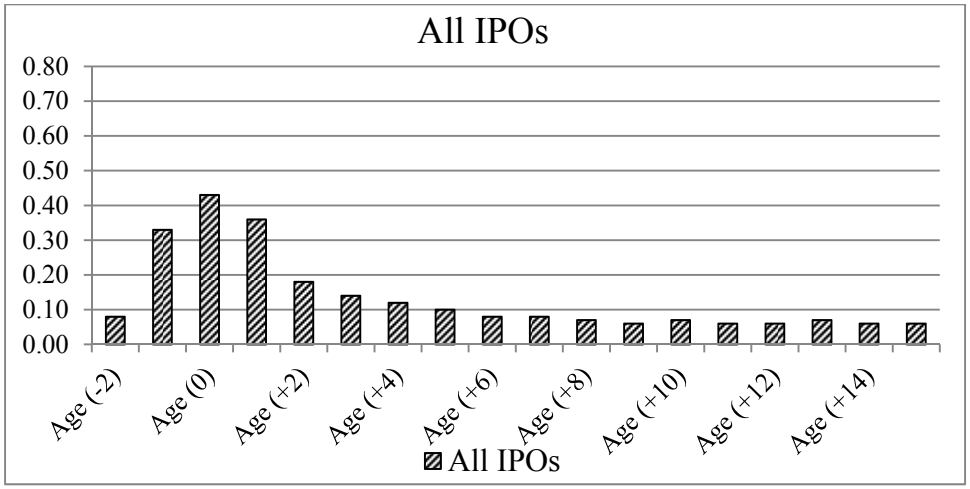
The table reports results from panel regressions with various measures of firm performance as dependent variable. The sample includes firms that go public in the period 1980-2010 and have data necessary to calculate employment growth during the IPO year. Each firm is followed through the first five post-IPO years or until delisting, if the firm is delisted prior to its 5th post-IPO year. *ΔLog(EMP)* is the annual change in the log of firm's total employment. *Acquisitions/Assets* and *Capx/Assets* are the firm's acquisition and capital expenditures made during the year scaled by total assets, respectively. *RD/Assets* is R&D expenditures (replaced with 0 if missing) scaled by total assets. *Size* is the natural logarithm total assets. *LT Debt/Assets* and *ST Debt/Assets* are the firm's long-term and short-term debt scaled by total assets, respectively. *KZ Index* is an index of financial constraints developed by Kaplan and Zingales (1997) and computed as in Lamont et al. (2001). *Post-IPO Year* is the difference between the current year and the year of a firm's IPO. *High Dependence* is an indicator variable takes the value of 1 if the firm operates in an industry with high dependence on external equity, and 0 otherwise. *Log(Primary Proceeds)* is the natural logarithm of 1 + the amount of primary proceeds raised in the offering, scaled by the book value of the firm's pre-IPO total assets. *VC-Backed* is an indicator that takes the value of 1 if the firm is backed by VC, and 0 otherwise. *Time as Private* is the natural logarithm of 1 + the number of years between the founding year of the firm and its IPO year. *ROA* is the firm's return on assets, defined as operating income before depreciation (OIBDP) scaled by total assets (AT). *Adj. ROA* is the firm's *ROA* minus the median ROA of all firms in that year and industry. *MTB* is the firm's market-to-book ratio of assets calculated as the market value of firm's assets divided by their book value. *Adj. MTB* is adjusted for the median MTB of all firms in that year and industry. Industry classification is based on 2-digit SIC codes. *Delisting* is an indicator that takes the value of 1 if a firm is delisted for performance-related reason (CRSP delisting code between 400 and 610) in that year and 0 otherwise. The estimation in columns (1) through (8) is ordinary least squares regression, while the estimation in column (9) is Logistic regression. In columns (1) through (4) the independent variables are contemporaneous to the dependent variable, while in columns (5) through (9) the independent variables are lagged by a period. Accounting variables are winsorized at the 1st and 99th percentile.

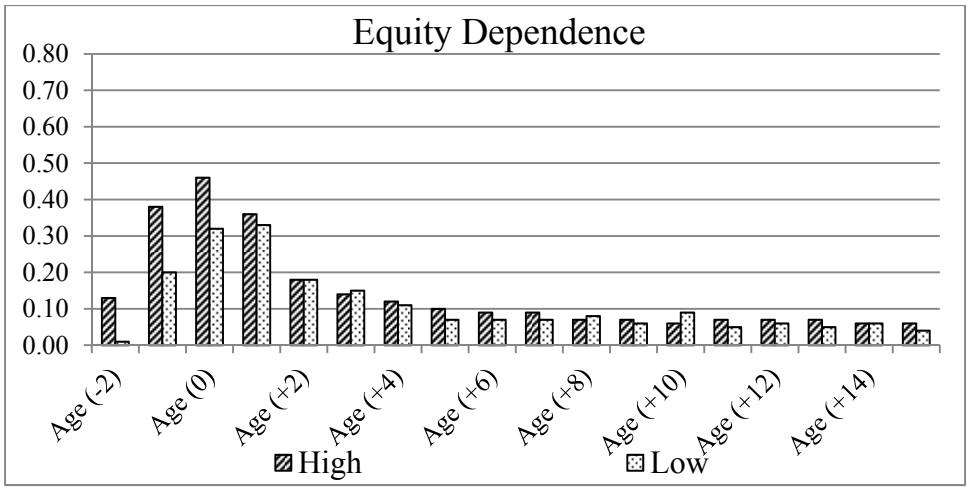
Table 7 continued.

	ROA	ROA Adj.	MTB	MTB Adj.	ROA	ROA Adj.	MTB	MTB Adj.	Delisting
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ΔLog(EMP)	0.107***	0.105***	1.031***	0.991***	0.043***	0.044***	0.381***	0.357***	-1.867***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Acquisitions/Assets	0.046	0.023	-2.051***	-2.307***	0.198***	0.172***	-1.493***	-1.678***	-3.685
	(0.102)	(0.411)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.237)
Capx/Assets	0.092***	0.041	0.424*	0.271	0.188***	0.139***	0.013	-0.046	-1.954
	(0.002)	(0.176)	(0.08)	(0.244)	(0.001)	(0.001)	(0.952)	(0.831)	(0.104)
R&D/Assets	-1.023***	-0.875***	3.132***	2.321***	-0.908***	-0.754***	3.939***	3.001***	-0.586
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.248)
Size	0.033***	0.036***	-0.062***	-0.048**	0.029***	0.032***	-0.089***	-0.071***	-0.772***
	(0.001)	(0.001)	(0.007)	(0.031)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
LT Debt/Assets	-0.159***	-0.165***	-0.755***	-0.661***	-0.122***	-0.131***	-0.141	-0.075	1.339***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.365)	(0.621)	(0.002)
St Debt/Assets	-0.365***	-0.366***	-0.189	0.073	-0.273***	-0.281***	-0.174	0.091	3.026***
	(0.001)	(0.001)	(0.441)	(0.759)	(0.001)	(0.001)	(0.497)	(0.717)	(0.001)
KZ Index	-0.012***	-0.011***	0.067***	0.065***	-0.008***	-0.007***	0.011	0.012	0.031
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.412)	(0.402)	(0.419)
Post-IPO Year	0.010***	0.008***	-0.101***	-0.091***	0.013***	0.011***	-0.063***	-0.061***	-0.037
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.475)
Log(Primary Proceeds)	-0.094***	-0.088***	0.492***	0.401***	-0.103***	-0.097***	0.407***	0.335***	-0.578***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
VC-Backed	0.021***	0.018***	0.033	-0.029	0.022***	0.018**	0.026	-0.027	-0.101
	(0.001)	(0.006)	(0.551)	(0.595)	(0.004)	(0.018)	(0.647)	(0.629)	(0.584)
High Dependence	-0.008	0.033***	0.154***	-0.133***	-0.007	0.036***	0.149***	-0.141***	-0.741***
	(0.163)	(0.001)	(0.001)	(0.005)	(0.274)	(0.001)	(0.004)	(0.005)	(0.001)
Time as Private	0.012***	0.009***	-0.012	-0.022	0.013***	0.009***	-0.024	-0.031	-0.501***
	(0.001)	(0.002)	(0.554)	(0.263)	(0.001)	(0.003)	(0.266)	(0.138)	(0.001)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	14,224	14,224	14,225	14,225	12,793	12,793	12,779	12,779	14,225
R-square/Pseudo R-square	0.546	0.489	0.680	0.265	0.399	0.351	0.665	0.207	0.723

Figure 1

The figure plots coefficients from the regression models in Table 3.





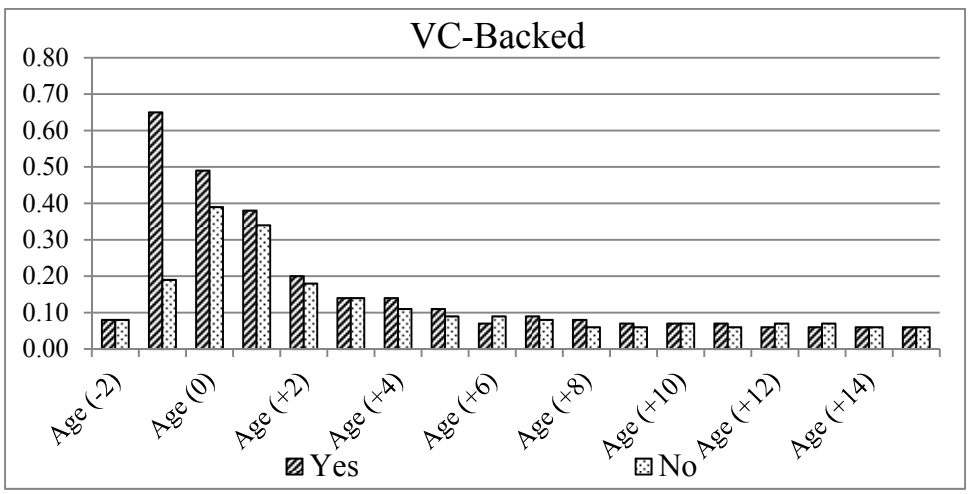
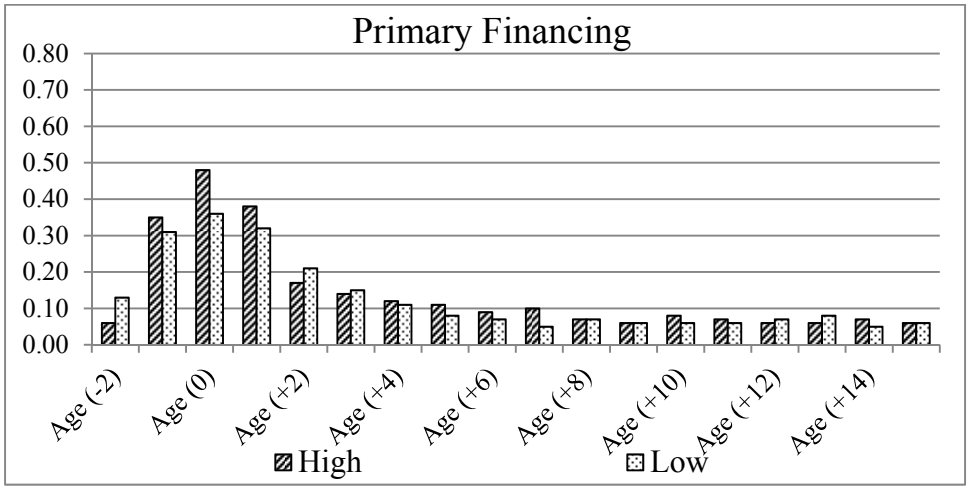
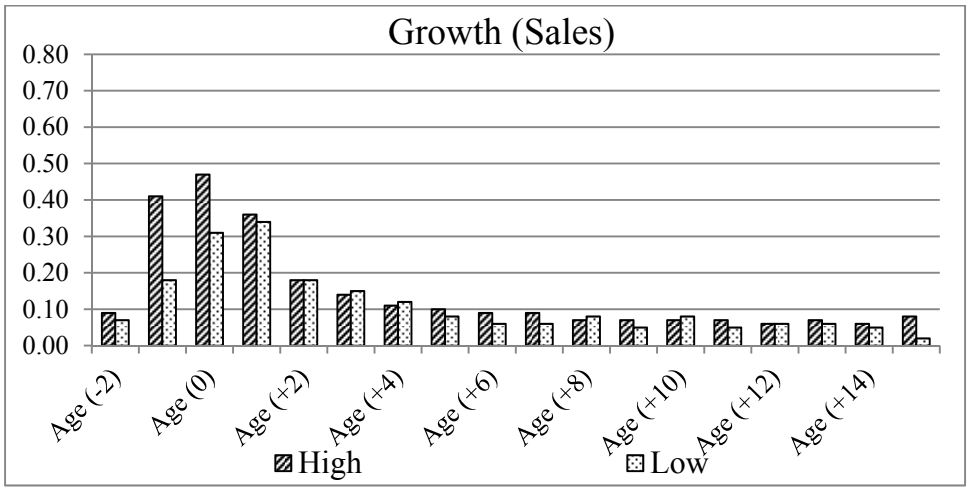


Figure 1 continued.





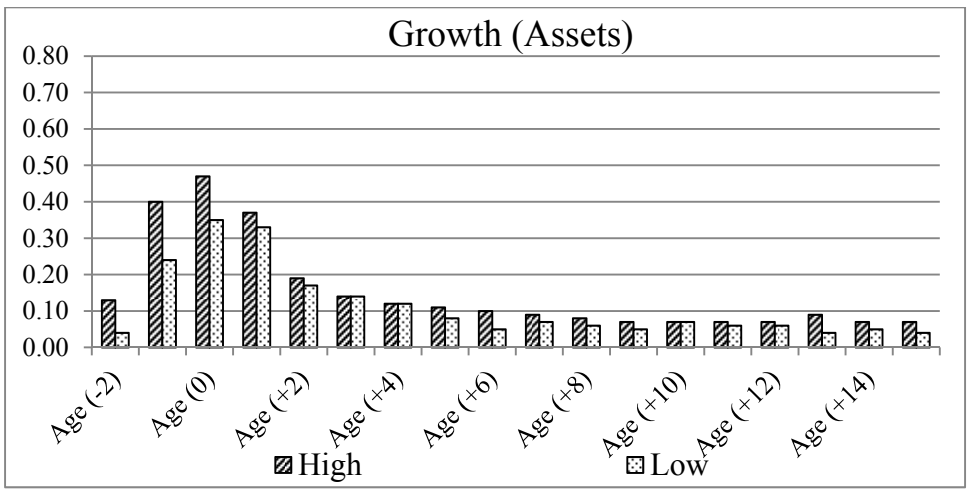


Figure 1 continued.