Access to Public Capital Markets and Employment Growth

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ABSTRACT

This paper examines the effect of going public on firm-level employment. To establish a causal effect, we employ a novel dataset of private firms to investigate employment growth in IPO firms relative to a group of firms that file for an IPO but subsequently withdraw their offering. We find that employment increases significantly after going public, and the increase is more pronounced in industries with requirements for highly skilled labor and greater dependence on external finance. Improved ability to undertake M&As and a strategic shift toward commercialization, rather than agency problems, explain employment growth. Overall, these results highlight the importance of going public for firms' employment policies.

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1. Introduction

This paper investigates the effect of going public on firm-level employment. An initial public offering (IPO) is a crucial stage in a firm's life cycle where financial constraints, ownership structure, information environment, and agency conflicts change upon listing. While these changes could have an impact on firm-level employment, there is limited knowledge regarding how going public affects the size and nature of a firm's labor force. The question is important for two reasons. First, anecdotal evidence indicates that small firms are the major drivers of employment growth in the U.S., especially after they gain access to public capital markets through an IPO.[1] Second, given the increasing importance of labor, especially highly skilled type, in a knowledge-based economy, examining how going public influences firm-level employment is important for academics and policymakers alike.

Extant research suggests that the most important motives driving the decision to go public are access to new and cheaper capital, insiders' desire to cash out, and improved ability to make acquisitions. All three motives could have potentially differential implications for the size and characteristics of a firm's labor force. If a firm goes public to reduce its financial constraints and raise capital for funding investment (Kim and Weisbach, 2008; Brav, 2009; Saunders and Steffen, 2011), one expects a resultant increase in capital expenditures (CAPEX). In the presence of complementarities between labor and capital, the availability of external financing could have a spillover effect on labor if it impacts capital investment (Benmelech, Bergman, and Seru, 2015). Although this link is certainly plausible, it is, a priori, ambiguous and the relationship might not be that straightforward. First, financing human capital is different from funding physical capital due to labor market frictions such as wage negotiations and employment protection legislation

[1] See Kenney, Patton, and Ritter (2012) on the importance of the IPO for small and growth-oriented firms' ability to expand their labor force.

(Matsa, 2018). Second, an IPO could coincide with a stage in the firm's life cycle or strategy to commercialize its products on a larger scale that do not rely on labor, but rather on efficient technologies (Pastor, Taylor, and Veronesi, 2009). Thus, an IPO could lead to an increase in physical capital without a proportional increase (indeed, any impact whatsoever) in human capital. If automation and capital-intensive production are more efficient, an IPO firm could even reduce its reliance on human capital. Besides its effect on the size of a firm's labor force, going public could also have an effect on its composition. Capital-based production could reduce the reliance on low skilled labor, such as manual production workers, but increase the demand for highly skilled labor, such as engineers and programmers, leading to a shift in the composition of employment with an ambiguous effect on its overall size.

Lower financial constraints could also mean that firms could improve their ability to undertake research and development (R&D) spending after going public (Brown, Fazzari, and Petersen, 2009). Since a greater portion of R&D expenses involves salaries paid to scientists and engineers, an increase in the ability to undertake R&D activity could translate in an increase in the quantity of highly skilled labor that the IPO firm can finance. Alternatively, as Bernstein (2015) suggests, going public could reduce a firm's appeal to such highly skilled labor due to agency and incentive problems prevalent in public firms.

An IPO also offers an exit opportunity for founders and employees to sell their shares. The listing of shares could lead to a wealth shock and, as a result, entrepreneurial employees and founders may exit, perhaps to pursue entrepreneurial endeavors by creating or joining new and younger firms (Babina, Ouimet, and Zarutskie, 2017). This argument suggests a reduction in the number of skilled employees after going public. However, given that an IPO also increases the firm's financial resources to hire R&D-focused labor and acquire firms with highly skilled workforce, whether the departure of entrepreneurial employees from IPO firms leads to an overall reduction in these firms' workforce remains unclear. For example, Bernstein (2015) finds that even though there is a significant post-IPO departure of inventors, the IPO firm attracts new inventors who generate more impactful innovation. Ultimately, the impact of going public on employment growth is ambiguous and the effect could vary across industries depending on labor force characteristics and human capital intensity.

Improved ability to conduct mergers and acquisitions (M&As) subsequent to going public could directly lead to an increase in employment because acquiring another firm implies obtaining, and retaining, at least a fraction, of the target company's employees. Subsequent to going public, firms gain an important ability to make stock-financed acquisitions. The ability to conduct cash-financed acquisitions also improves due to a possible reduction in borrowing costs and post-IPO access to equity capital markets through seasoned equity offerings (SEOs) (Celikyurt, Sevilir, and Shivdasani, 2010).

In addition to the changes outlined above, going public also impacts the firm's ownership structure and managerial incentives. Agency problems are likely to increase in the post-IPO period due to separation of ownership and control. On the one hand, managers of public firms may have differential incentives and/or abilities to pursue empire-building strategies, which could lead to higher employment. On the other, it is often argued that compared to private firms, public firms exhibit short termism and lower responsiveness to long-term growth opportunities. While there is no direct examination of the impact of empire-building on employment, the evidence on the link between responsiveness to investment opportunities and employment growth for public and private firms is ambiguous. For instance, Asker, Farre-Mensa, and Ljungqvist (2014) show that when compared to private firms, public firms exhibit myopic investment behavior and under-respond to investment opportunities. This suggests that IPO firms could exhibit lower employment growth compared to their private counterparts. By contrast, Maksimovic, Phillips, and Yang (2019) find that public firms experience greater employment growth compared to matched private firms.

Given the existence of multiple motives for going public and mechanisms operating at the IPO stage, we seek to examine how employment levels change around the transition of a firm from private to public status and to shed light on the underlying channels. To implement this analysis, we obtain data on private firms from the National Establishment Time-Series (NETS) database. We construct two samples: A sample of private firms that file an initial registration statement with the SEC for an IPO and complete the offering, and a sample of private firms that file for an IPO, but withdraw their filing. We conduct an instrumental variable (IV) analysis following Bernstein (2015) because the decision to withdraw could correlate with unobservable firm characteristics driving firm-level employment growth. We instrument the withdrawal decision with (short-term) post-filing stock market conditions. Unfavorable market conditions are argued to be a primary determinant of the decision to withdraw an offering and could offer some variation unrelated to post-IPO/post-withdrawal employment dynamics of individual firms. We capture unfavorable market conditions through two variables. The first is the average daily return on S&P500 over the five trading days with the lowest return during the two-month period following the filing date. The second variable is the log of the average daily volume on S&P500 during this period.

The results of the IV analysis show that firms with completed offerings experience greater employment growth in the post-IPO period. Firms with completed offerings exhibit almost 37% higher employment growth during the IPO year and, by the end of the second post-IPO year, they double their employment relative to firms that withdraw the offering and remain private. To the extent that *short-term* market conditions are not correlated with unobservable firm characteristics that affect *long-term* employment outcomes, these results suggest a causal effect of going public on employment growth.

We also explore possible heterogeneous effects of the observed positive relationship between going public and employment growth using two industry characteristics: external equity dependence and human capital intensity. The IV analysis indicates that the positive effect of going public on employment growth exists in industries characterized by greater dependence on external financing. We also find that IPO firms in industries with skilled and sophisticated human capital grow their employment more.

We then proceed to investigate possible channels through which going public could affect the size of a firm's labor force. Our initial focus is on the relaxation of financial constraints. If going public facilitates employment growth through relaxation of financial constraints, this effect should be stronger for firms that are more constrained at the time of their IPO. We use firm age as a proxy for the degree of financial constraints and find that younger firms exhibit greater employment growth in the post-IPO period. We also examine the modes through which financial constraints are relaxed. An IPO provides an immediate access to public equity capital in the form of initial proceeds which relax short-term constraints. However, another relaxation of constraints occurs through the higher transparency and information dissemination in the post-IPO period. This channel would reduce the cost of both debt and equity capital, leading to a relaxation of long-term constraints. We use the proceeds from the sale of primary shares as a measure of short-term relaxation and the reduction in the cost of credit as a measure of long-term relaxation of financial constraints (Pagano, Panetta, and Zingales, 1998). Our results show that the sale of primary shares correlates with employment growth during the IPO year, but the effect is short-lived. By contrast, the reduction in the cost of credit correlates significantly with employment growth over extended periods of time, i.e. up to two years following the IPO.

We then investigate whether going public has a differential impact on the hiring of highly skilled employees by examining the human capital intensity of the industry in which the firm operates. We find that IPO firms in human capital intensive industries experience greater employment growth. More importantly, employment growth in human capital intensive industries is greater for younger firms, supporting the view that going public allows more constrained firms to attract and employ highly skilled labor.

Another potential channel driving the post-IPO employment growth of a firm could be a shift in the strategy of the firm around its IPO (Pastor et al., 2009). Firms can go public to commercialize their innovations on a large scale and would thus require more employees for sales, production, and marketing. We use the intended use of IPO proceeds (stated by the firm in its prospectus) to examine whether a change in the strategy of the firm towards commercialization can explain post-IPO employment growth.[2] We find that IPO firms indicating that the primary use of their IPO proceeds will be to finance sales and production experience greater employment growth during the IPO year. This suggests that a potential shift to commercialization can explain part of the employment growth, at least in the short term.

Going public also enhances the ability of firms to undertake acquisitions by creating an acquisition currency through their own stock or by facilitating capital raising for cash acquisitions. In fact, we find that both cash and stock-financed acquisitions significantly correlate with post-IPO employment growth. For our purposes, the importance of stock-financed acquisitions is self-evident as they would have been very hard to undertake without a public listing.

[2] IPO firms disclose information about the primary use of capital raised at the IPO, such as the financing of a greater volume of production and sales, working capital needs, R&D and innovation activities, or recapitalization of the firm.

Finally, we examine the role of agency problems in explaining employment growth. First, we exploit the relation between post-IPO M&A activity and employment growth. The separation of ownership and control in publicly traded firms could lead to value-destroying acquisitions, driven by managerial self-interest and empire-building, rather than value maximization. To differentiate between these, we look at the announcement returns of M&A deals and examine the relation between the volume of transactions with positive and negative returns and employment growth. We find a strong positive relation between the volume of M&A transactions with positive announcement returns and employment growth. Second, we examine the effect of insider ownership and institutional ownership. These represent mechanisms that could limit the severity of agency problems and their effect on employment growth. Our analysis reveals a very weak relationship between these characteristics and employment growth. Overall, our tests suggest that agency conflicts play a modest role, if any, for post-IPO employment growth.

Our paper contributes to several strands of the literature. First, it adds to the literature investigating motives for and outcomes of the going public decision. Extant research establishes several motives (Pagano, Panetta, and Zingales, 1998; Mikkelson, Partch, and Shah, 1997; Lowry, 2003; Boehmer and Ljungqvist, 2004; Kim and Weisbach, 2008; Celikyurt, Sevilir, and Shivdasani, 2010, among others). We are the first to investigate in a systematic way the largely unexplored question of the impact of the IPO decision on workers, a crucial stakeholder of the firm. Our findings complement the analysis by Kenney, Patton, and Ritter (2012), while our empirical strategy based on exogenous variation and the analyses of possible channels generate insights into the micro-foundation of the link between going public and firm-level employment.

Our work also relates to Bakke, Jens, and Whited (2012), who demonstrate that delisting of a firm's stock from the exchange results in a decline in employment. Babina, Ouimet, and

Zarutskie (2017) find that going public leads entrepreneurial employees of firms in the technology sectors to exit the firm to join new startups. We analyze a comprehensive set of heterogenous industries to generate a more complete picture of the effect of the going public decision on firm employment, while exploiting industry heterogeneity to shed light on the underlying channels. Some of our main findings are corroborated by recent work by Kim et al. (2019) who show that raising capital at SEOs allows Chinese firms to hire highly skilled employees. Our finding on the role of improved access to debt capital subsequent to the IPO is also related to the impact of availability of credit on labor documented in Benmelech, Bergman, and Seru (2015).

Our paper is also related to the literature that investigates the relationship between finance and labor. There has been a growing number of papers studying the implications of corporate events such as M&As and leveraged buyout transactions for firm-level employment. Lagaras (2019) finds evidence of efficient reallocation of labor following an M&A deal consistent with the neoclassical view. Davis et al. (2015) examine the impact of leveraged buyouts on employment, while others have studied private equity transactions internationally (Boucly, Sraer, and Thesmar, 2011; Amess and Wright, 2007).

The remainder of the paper is organized as follows. Section 2 describes the data, sample construction, and empirical strategy. Section 3 establishes the positive link between the IPO of a firm and its employment using IV analysis. Section 4 focuses on the possible underlying channels driving the observed employment dynamics, while Section 5 provides the conclusions.

2. Data and empirical strategy

2.1. Data sources and sample construction

Our empirical analysis has two objectives and consists of two parts. In the first part, we try to establish the causal effect of going public on employment growth, while in the second part we investigate channels that could drive the observed effect, if any. Therefore, we use several different data sources, including a novel dataset on private firms. We next discuss each of the data sources and explain how they enable the two parts of our analysis.

2.1.1. Data for analysis of the effect of going public on employment growth

We begin by extracting a sample of IPOs that took place from 1980 to 2010. To construct this sample, we use all IPOs by U.S. firms available on Thomson Reuters' Global New Issues (GNI) database. Following common filtering criteria, we exclude real estate investment trusts, closed-end funds, rights, units, foreign issues, and ADRs. The search yields 8,569 offerings from January 1980 to December 2010. We cross-validate this sample with data from both CRSP and Compustat, leading to a sample of 7,953 offerings.

The key drawback when using data exclusively for publicly listed firms is that we will not be able to generate inferences about the counterfactual employment growth had the firm remained private. Since our first objective is to draw causal inferences about the effect of going public on employment growth, our identification strategy, discussed in detail in Section 2.2, relies on a comparison of IPO firms to a control group of comparable private firms. The control group consists of firms that file for an IPO, but eventually withdraw the offering.

The data for the investigation of the causal link between going public and employment growth are from the NETS database. The NETS database is hosted by Walls & Associates and assembled in collaboration with Dun and Bradstreet (D&B). Specifically, it links D&B's annual cross-sectional snapshots of the Duns Marketing Information (DMI) file. The file, organized by D&B, captures annually the universe of establishments in the U.S. Every January, D&B completes a data collection process by making more than 100 million telephone calls, collecting information through court filings, news, electronic reports, company filings, and the U.S. postal service.[3]

In collaboration with D&B, Walls & Associates develops procedures for linking the annual cross-sections into a longitudinal file that follows businesses and their units over time. In other words, the NETS database is a panel that tracks every establishment from its birth to ultimate disappearance (e.g., closure, bankruptcy) through organizational and geographic changes. Each establishment is uniquely identified through a Data Universal Numbering System (DUNS) number. The database reports information on the establishments' physical location, sector of activity, annual employment and sales figures, name and business address, and "Family Tree" (i.e., headquarter links that connect establishments to their respective headquarters and/or subsidiaries, if any).

The extract of the NETS database we use in this paper is from 1990-2012. To generate business-level information on firms' employment dynamics, we aggregate the establishment-level data up to the respective parenting headquarters. We obtain annual employment and sales figures, as well as measures of credit worthiness and industry classification. We first match the initial sample of IPO firms identified above to the NETS database using the DUNS numbers provided by the GNI database. The GNI database has a DUNS number for approximately 50% of the sample of completed offerings. Due to data coverage, this analysis is restricted to the period 1990-2010,

[3] Kolko and Neumark (2007) provide detailed information regarding data collection efforts and individual annual files.

which is the overlapping period common to both data sources. The resultant sample, which we use and refer to as the "NETS IPOs sample", includes 2,914 IPOs.

To construct the control group, we compile a sample of private firms that file for an IPO, but withdraw the offering and remain private.[4] We obtain data of the withdrawn offerings from the GNI database and match them to the NETS database using the DUNS number. The data availability from using DUNS identifiers is much smaller for the sample of withdrawn offerings. To alleviate this issue, we perform a manual search for information about each firm with a withdrawn offering in the Hoover's Database in order to identify its DUNS number. The withdrawn offerings sample, called in our analysis "Withdrawn IPOs sample," consists of 536 firms.

Several studies assess the reliability of the NETS database and compare its properties to official U.S. data on business activity (Neumark et al., 2005; Paglia and Harjoto, 2014; Barnatchez et al., 2017). We also examine how the employment and sales figures obtained from the NETS database for the NETS IPOs sample compare to those reported in Compustat. We collect sales and employment figures from Compustat, where available, for the firms in the NETS IPOs sample and examine how the two data sources fare. The correlation between the employment figures as of the beginning of the IPO year between NETS and Compustat is 0.61, while the correlation between the sales figures is 0.55. Both are significant at the 1% level. We also observe that the correlations are higher for larger firms (those with above-median sales), which is consistent with prior analyses of the database, but they remain significant at 1% for both subsamples of small and large firms.[5]

[4] When a firm decides to have an IPO, it submits an initial registration statement to the SEC, usually Form S-1. It contains essential firm business and financial data. Following this, prospective issuers start a book-building process, but have the option to withdraw the offering using the RW Form. IPO withdrawals are not uncommon. Bernstein (2015) reports that approximately 20% of all IPO filings are withdrawn. There may be various reasons behind the withdrawal decision (Busaba, 2006; Busaba, Benveniste, and Guo, 2001), but Bernstein (2015) suggests that the most common reason is unfavorable market conditions that may limit the success of the offering.

[5] For robustness purposes, we verify the main results on subsamples of small firms and large firms, where small firms are those with below-median sales at the beginning of the IPO year. While the magnitude of the estimated effects differs across the subsamples, the direction and statistical significance remain unchanged.

2.1.2. Data for analysis of underlying channels

The key drawback to the NETS database is that it offers a limited number of firm-specific characteristics. We need such characteristics to explore some of the channels that could drive the link between employment growth and going public, as well as to control for factors that can affect firm-level employment growth. To circumvent this data availability issue, we use the Compustat database that offers a wide array of data including firms' financial statements. While the primary scope of Compustat is public firms, it backfills information, if available, for some firms even prior to IPO. However, the data on pre-IPO employment is often missing. We are able to compute the change in total employment during the IPO year for 3,654 firms out of our initial extract of IPOs. For expositional purposes, we refer to these firms as the "Compustat IPOs sample".

As this sample is a subset of all IPOs, one might be concerned about the generalizability of the results obtained from the Compustat IPOs sample to the broader population of all IPOs. To mitigate the concern, we examine the comparability between the Compustat IPOs sample and all other IPOs. We first note that the IPOs in the Compustat IPOs sample constitute at least one-third of all IPOs for almost all years. Looking at several firm characteristics, we find similarity between the IPOs included in the analysis and those that are not. At the time of their IPO, the firms in the former group are slightly older, larger, and more likely to be supported by venture capital (VC). For instance, the median age since founding at IPO in the Compustat IPOs sample is eight years, the median size in terms of total assets is $28.2 million, and 41% of the firms are backed by VC, while the median age for all other IPOs is seven years, the median size is $18.9 million, and 31% are backed by VC. These observations suggest that our analysis potentially underestimates the impact of going public on employment growth because the initial access to public equity might be more important for younger and smaller firms. Consistent with this interpretation, during the IPO year, firms in the Compustat IPOs sample spend less on capital expenditures and R&D compared to all other IPO firms. Specifically, the former invest, on average, 24% of their pre-IPO assets in Capex and 21% in R&D, while the latter spend, on average, 29% and 25%, respectively.

2.2. Empirical strategy

It is challenging to establish a causal impact of going public on firm-level employment. To investigate whether going public affects firm-level employment, one could track the employment dynamics of IPO firms over a horizon spanning multiple years before and after their private to public transition. However, even if there is a positive relation between the IPO and employment growth, this does not necessarily imply that employment growth is more pronounced than it would have been otherwise. Such a within-firm variation approach is difficult due to self-selection and reverse causality concerns.

One potential solution to address the concerns could be to compare firm-level employment of IPO firms with that of similar private firms that choose to remain private. However, even if one finds that the employment dynamics of IPO firms in the post-IPO period are different from those of private firms with similar characteristics, such a finding would have the limitation that unobservable factors could be behind the decision of the private firms in the control group to not go public. This limitation could be mitigated by comparing the employment dynamics of IPO firms to those of a sample of private firms that also file to go public but withdraw their offerings. Given that these firms initiate the going public process, they should be fundamentally more similar to the sample of IPO firms. However, comparing IPO firms to this set of firms with withdrawn offerings is not immune to the criticism that differences in employment growth could be due to unobservable firm characteristics that correlate with both firm-level employment growth and the withdrawal decision, unless the withdrawal is for exogenous reasons.

To mitigate the above concerns, we conduct an IV analysis of the IPO effect on firm-level employment growth. To implement the analysis, we broadly follow Bernstein (2015) who suggests that the decision to withdraw is often associated with unfavorable post-filing stock market conditions. To capture such conditions, our study relies on two instruments. The first is the average daily return on S&P500 over the five trading days with the lowest return during the two-month period following the filing date for the offering. The second instrument is the log of the average daily trading volume on S&P500 during this period. Since filing firms are sensitive to stock market fluctuations, it is plausible to expect that the likelihood of a withdrawal will be greater when the market return is lower. Similarly, trading volume could reflect market liquidity and thus affect the likelihood of IPO completion. To the extent that these instruments, short-term market conditions, are uncorrelated with unobservable firm-specific characteristics that affect long-term employment decisions, the IV approach would help us establish the causal effect of going public on employment growth. We include year fixed effects in all specifications and, thus, any longer-term market-wide effects on employment growth in the post-IPO period should be absorbed.

3. Employment dynamics around the IPO

3.1. Baseline results – Instrumental variable analysis

The IV analysis uses the NETS IPOs sample and the Withdrawn IPOs sample. First, we present summary statistics for employment growth [Δ*Log(Emp)*] over various pre- and post-IPO periods. We also report employment (*Emp*), sales (*Sales*), sales growth [Δ*Log(Sales)*], and credit rating, *Rating(PayDex),* which is a numerical score assigned by D&B that measures firms' credit worthiness assessing the risk of late payments. The score ranges from zero to 100 with higher score indicating lower risk.

[Insert Table 1]

Panel A of Table 1 presents the summary statistics for the NETS IPOs sample. On average, an IPO firm has 620 employees one year prior to going public (median is 100). The average employment growth rate (change in log employment) during the IPO year (Year 0) is about 38%. By the end of the second post-IPO year, the cumulative growth is about 98%, on average. The average firm has $70 million of sales before going public.

Panel B provides summary statistics for the Withdrawn IPOs sample and reports whether the respective statistic (mean or median) for each variable is significantly different from that for the NETS IPOs sample. Note that firms with withdrawn offerings are similar to the firms with completed IPOs in terms of pre-filing employment and sales levels. Consistent with our arguments, employment growth after withdrawal differs significantly from that after completed IPO. During the withdrawal year, firms with withdrawn offering have an average employment growth of about 20%, which is significantly lower than the growth observed for completed IPOs (38%). Over the next two years, the cumulative growth in employment is only about 40% for the Withdrawn IPOs sample, which is significantly lower than that of completed IPOs (98%).

Using the firms in the NETS IPOs sample and the Withdrawn IPOs sample, we proceed to a two-stage estimation for the IV analysis. In the first stage, we estimate a regression where the dependent variable is an indicator defined as one if the filing firm completes its IPO successfully and zero otherwise. The second stage equation estimates the impact of the instrumented IPO completion on the firm's employment growth.

[Insert Table 2]

Table 2 presents the results of the second stage of the IV analysis. *D(Complete)* is the predicted value for completed IPO from the first stage regression. In Columns (1)-(3), we examine the effect of IPO completion on employment growth [*ΔLog(Emp)*] over the IPO year (Year 0). We present a baseline model where the only controls are year and industry fixed effects in Column (1), while in Column (2) we also control for firm size [*Log(Sales)*]. In Column (3), we add additional control variables. First, we use sales growth [*ΔLog(Sales)*], which has been extensively used by the literature to proxy for investment opportunities (Shin and Stulz, 1998; Bloom, Bond, and van Reenen, 2007; and Michaely and Roberts, 2012). Second, we include the credit rating of the firm [*Rating(PayDex)*]. Since the rating is missing for approximately 20% of the firms, we code it as zero for firms with a missing PayDex score and interact it with an indicator *D(Rating)* that takes the value of one for firms with rating and zero otherwise.[6] In Columns (4)-(6), we examine the change in log-employment over the two-year period from the beginning of the IPO year to the end of the first post-IPO year (i.e., Year 0-1), while in Columns (7)-(9), the focus is on the three-year period from the beginning of the IPO year to the end of second post-IPO year (i.e., Year 0-2). In all specifications, we include year and industry fixed effects.

The coefficient on the variable *D(Complete)* is significant in all columns, and at the 1% level in eight of the nine specifications. This result suggests that firms that complete their offering experience greater employment growth relative to firms that withdraw their offering for exogenous reasons. The estimated effect is not only statistically significant, but also economically important.

[6] This procedure, called a "modified zero-order regression," is used by Hollander and Verriest (2016) to examine credit ratings and loan contracts. The authors argue that it could address possible selection bias, while maintaining sample size. The results of our analysis are qualitatively similar if we estimate the models without this approach.

For instance, using the estimates from Column (3), we infer that firms with completed offerings grow their labor force at a rate that is almost 37% higher than that of similar firms that withdraw their offering. Column (9) results suggest that IPO firms almost double their employment relative to the firms in the Withdrawn IPOs sample by the end of the second post-IPO year. We also note that the coefficients on the control variables are mostly intuitive. Larger firms tend to grow at a smaller rate, while firms with better credit ratings expand their employment faster. However, firms with available ratings hire at a lower rate around the IPO. The firm's sales growth relates positively to its employment growth, but the coefficient is not statistically significant.

Overall, the IV analysis supports a causal effect running from going public to employment growth to the extent that the instruments are uncorrelated with unobserved firm characteristics that may affect future employment over a long post-IPO horizon spanning a couple of years. For our instruments to be valid, they should affect the decision to complete an IPO and should not affect the future (long-term) employment growth of the firm except through the completion decision. We report the first stage regression results in Table A1 of Appendix B and these indicate that both instruments are highly correlated with the withdrawal decision. The first stage F-statistics for the different specifications are reported in Table 2 and all of them exceed the respective critical values, supporting the validity of our instruments. As more than one instrument is used, it is also possible to infer that the null hypothesis that the instruments are uncorrelated with the residuals cannot be rejected at conventional levels. The *p*-values of these tests are reported in the last line of Table 2.

3.2. Financial constraints and human capital

The previous analysis establishes a positive impact of going public on employment growth. We next examine possible heterogeneous effects underlying this relationship by exploring industry characteristics to obtain more nuanced insights.[7] A key motive for going public is to raise capital to fund corporate investment. Thus, we examine whether the impact of initial access to public equity on employment growth depends on the external equity dependence (EED) of the firm for funding investment. If going public provides access to cheaper and more abundant capital and facilitates hiring new employees, the effect of initial access to public equity markets should be stronger for firms operating in industries that fund more of their investment through equity (i.e., with greater dependence on external equity finance). Hence, we create an indicator *D(High EED)* that takes a value of one if the firm operates in an industry with high EED. To construct the industry-level measure of dependence, we follow the approach by Rajan and Zingales (1998). Specifically, using the universe of all Compustat firms, we calculate the ratio of net amount of equity issues for each firm, constructed as the difference between the sale of common and preferred stock and the purchase of common and preferred stock, and investment in the form of capital expenditures. We then employ the median of the firm-level ratio for all firms that belong to the same industry, defined at the two-digit SIC level, to determine the EED of each industry. Finally, we use the median of the industry-level measures and categorize firms in industries with above-median industry EED as dependent on external equity and set *D(High EED)* equal to one.

We add the interaction between *D(Complete)* and *D(High EED)* to the specification used for the IV analysis. Given the industry-specific nature of the indicator for dependence, which is included as a separate variable, we estimate the models without industry fixed effects, but retain time fixed effects.

[Insert Table 3]

[7] The motivation to use industry characteristics is twofold. The NETS database offers a limited set of firm-specific characteristics and industry characteristics are less likely to be within the control of the individual firm.

Table 3 presents the estimation results. The coefficient on *D(Complete)* in this specification captures the effect of going public for firms operating in industries that depend less on external equity and it is no longer statistically significant. The coefficient of most interest is the one of the interaction between *D(Complete)* and *D(High EED)*. It is significant at the 10% level in the IPO year for two of three specifications (Columns (1) and (2) of the table) and becomes larger and more significant over longer horizons. In fact, over longer horizons (Year 0-1 and Year 0-2) it is robustly significant at the 5% level or better. The key takeaway from this analysis is that the effect of going public on employment growth is stronger for firms that are more dependent on external equity.

Changes in the post-IPO employment profile of the firm could also depend on the nature or skill of the required human capital and the IPO might be the mechanism for acquiring this capital in certain sectors of the economy. To test this idea, we continue with the IV analysis but augment our baseline specification with an industry-specific measure of human capital intensity (HCI). The underlying idea is to capture the importance of highly skilled labor force in a given industry. For robustness, we rely on three HCI measures but present our analysis using only one of them for the sake of brevity. We report our estimations with all measures in the Online Appendix.

We construct the first HCI measure using average annual wages for each industry from the Occupational Employment Statistics gathered by the Bureau of Labor Statistics (BLS). Motivated by the notion that wages correlate with skill, we use industry-level annual average wage data from 2003 to 2016 for all occupations to rank industries. We then classify industries in the top tercile as high HCI industries and create an indicator *D(High HCI)* that takes a value of one if the firm is in such an industry, and zero otherwise.

The second HCI measure is similar to the first measure but uses data on wages and salaries obtained from the National Accounts published by the Bureau of Economic Analysis (BEA) and adopted by Philippon and Reshef (2012). Specifically, we use wages and salaries for full-time equivalent employment in each industry from 1990 to 2010 and then rank industries based on these figures. We then again classify industries in the top tercile as having high HCI.

The third measure uses input different from wages and instead focuses on the level of training required by an occupation. We follow Parham (2017) and construct an industry-specific measure of human capital using the BLS Education and Training dataset that provides education and training requirements by occupation code for 820 occupations. The data on these requirements are mapped into NAICS codes using BLS National Employment Matrix and then used to determine the percentage of employees in each occupation for each industry. Based on these percentages, we compute the weighted average educational requirement for each industry and classify industries in the top tercile as having high HCI. It is important to note that we observe high correlations, above 0.8, across all three human capital intensity measures developed above.

We augment the baseline IV specification by including the indicator *D(High HCI)* based on the first HCI measure discussed above and its interaction with *D(Complete)*.

[Insert Table 4]

Table 4 presents the results of our analysis. After including the measure of human capital intensity of the industry of the IPO firm, the indicator for completed IPO is positive, but mostly insignificant. By contrast, the interaction between *D(Complete)* and *D(High HCI)* is positively related to employment growth and is statistically significant at 10% level or better in eight of nine specifications. We infer that there is a stronger relationship between going public and employment growth for firms in industries with high human capital intensity. This is consistent with the view that IPOs provide resources to hire skilled labor. To the extent that there is a greater competition for skilled labor, an IPO is likely to provide the financial means necessary to pay the higher price associated with such labor. It is also interesting to note that *D(High HCI)* is negatively related to employment growth. This result indicates that firms with withdrawn offerings in human capital intensive industries experience a negative employment growth and thus confirms the importance of going public for hiring highly skilled labor.

After separately examining the effects of external equity dependence and human capital intensity on the employment growth of a firm going public, we proceed with an analysis of how these industry characteristics might jointly affect employment growth. Specifically, we create four indicators that capture the extent of reliance of an industry on external equity as well as its human capital intensity. For example, if an industry exhibits both high external equity dependence and high human capital intensity, we create an indicator variable *D(High EED & High HCI)* and set it equal to one, and zero otherwise. We interact each of the four indicator variables with *D(Complete)* and repeat the IV analysis.

[Insert Table 5]

As Table 5 shows, firms in industries with greater external equity dependence and greater human capital intensity experience positive employment growth over all post-IPO horizons and the effect is significant at the 1% level. The effect is weaker if we look at industries with high external equity dependence but low human capital intensity. In this case, we find a significant positive effect only in the two-year and three-year period after the IPO. We also observe that going public facilitates employment growth in industries with low dependence on external equity but high human capital intensity but only marginally in the longer post-IPO horizon. Last, we note from Table 5 that firms with withdrawn IPOs exhibit negative employment growth, especially in industries with high external equity dependence and high human capital intensity. This result provides further support for the causal effect of going public on employment growth, particularly in industries with greater need for financial resources to hire skilled labor.

Overall, the results from the IV analysis generate three main findings. First, there is a significant increase in employment growth of firms around their IPO. Second, the increase is greater for firms that are more dependent on external equity. Third, the impact of going public on employment is stronger for firms in industries with high human capital intensity. In other words, an IPO not only facilitates the expansion of the labor force of a firm, but also enhances its ability to hire skilled labor.

4. Underlying channels

We next proceed to investigate possible channels underlying the estimated effect of going public on employment growth. In the analysis of these channels, we use the Compustat IPOs sample because of the data availability issues discussed in Section 2. There is an important caveat preceding the analysis: The channels we examine need not be mutually exclusive.

4.1. Relaxation of financial constraints

We first examine whether going public impacts employment through the relaxation of financial constraints. Firms going public raise capital by selling primary shares at the IPO resulting in an immediate infusion of cash and a short-term relaxation of financial constraints. Importantly, going public not only provides the firm with an access to public equity, but it also enhances its ability to access public debt markets leading to a long-term relaxation of financial constraints. As a result, an IPO firm is likely to have greater ability to finance employment growth relative to its ability had it stayed private. To examine this argument, we recognize that the importance of relaxing financial constraints for employment should be greater for more constrained firms. We rely on firm characteristics to reflect the magnitude of financial constraints. Private firms that are younger at the time of their IPO are likely to be more constrained than older firms. Moreover, firms that have existed as private firms for a long period of time are more likely to have alternative financing ways, such as well-established banking relationships, that could have made their long private existence possible. As such, we use firm age at the time of IPO as a proxy for the degree of financial constraints of an IPO firm and examine how employment growth around the IPO of a firm varies with its age since founding.

[Insert Table 6]

Table 6 provides the results of this analysis. Columns (1), (5), and (9) report baseline specifications that include *Age*, as well as year and industry fixed effects, as the only explanatory variables. Younger firms experience a greater increase in employment during the IPO year, as well as during the first one- and two-year post-IPO periods. This finding emphasizes the importance of going public in providing capital for young and financially constrained firms to possibly create new jobs and employment. In Columns (2), (6), and (10), we confirm this result after augmenting the baseline model with a set of controls: *Pre-IPO Size (Assets)*, *VC-Backed*, *D(Acquisitions)*, *Capex/Assets*, *R&D/Assets*, and *MB Ratio*. Definitions of these controls are provided in Appendix A. The findings with respect to the measure of the magnitude of financial constraints (i.e., *Age*) continue to hold in the new specifications. We further find that VC-backed IPOs exhibit greater employment growth. Larger firms with more pre-IPO assets grow at a slower rate, while firms with greater growth opportunities grow faster. As expected, firms that invest more in CAPEX or firms that complete acquisitions during the post-IPO horizon experience greater employment growth. R&D spending is not robustly significant in explaining employment growth.

The magnitude of the relaxation of financial constraints subsequent to the IPO should also be positively related to employment growth if relaxation of financial constraints is an important driver of post-IPO employment growth. To examine this conjecture, we introduce two measures of post-IPO relaxation of financial constraints. The first measure is the amount of proceeds raised from the sale of primary shares scaled by the pre-IPO assets of the firm. The second measure captures the magnitude of relaxation of financial constraints by the reduction in the cost of credit following an IPO. If an IPO leads to an increase in the bargaining power of a firm vis-à-vis its lenders as suggested by Rajan (1992), then the cost of credit should decrease. We follow Pagano et al. (1998) and define the Relative Cost of Credit (RCC) as one plus the cost of credit for the IPO firm scaled by one plus the median cost of credit for all Compustat firms for that year. The cost of credit is the ratio of total interest expense to total long-term and short-term debt. As the actual RCC measure exhibits great variability, we create an indicator *D(ΔRCC)* that takes a value of one if the change in RCC of a firm is in the bottom quartile (i.e., firm with the greatest reduction in the cost of credit). We expect the first measure to reflect the relaxation of the firm's constraints in the short term and the second to capture the relaxation over the longer term.

Columns (3), (7), and (11) of Table 6 show that both measures of the degree of relaxation of financial constraints are significant in explaining employment growth in the IPO year, as well as in the one-year period following the IPO. Firms with relatively larger decreases in the cost of credit, as well as firms raising more equity capital at their IPO, exhibit higher employment growth. As expected, the significance of the primary proceeds raised at the IPO diminishes over time and the effect disappears shortly after the immediate aftermath of the IPO, while the effect of improved access to debt capital remains robustly significant.

To examine further the importance of the relaxation of financial constraints for post-IPO employment growth, we interact the measures of the degree of relaxation of financial constraints with firm age in Columns (4), (8), and (12). We conjecture that the effect of the relaxation of financial constraints should be greater for firms that are ex ante more constrained. The coefficient on the interaction between *Age* and *Log(Proceeds)* indicates that the short-term relaxation of financial constraints is independent of the age of the firm at IPO. However, the coefficient of the interaction between *Age* and *D(ΔRCC)* indicates that a greater reduction in the cost of credit is associated with greater employment growth for younger firms, though only in the two-year period following the IPO. The significance of the interaction term over the longer horizon (i.e., Year 0-2) suggests that younger firms benefit more from the dissemination of information in the post-IPO period.

Our IV analysis underscores the effect of an IPO in sectors with highly skilled labor. We next proceed to test whether the relaxation of financial constraints benefits firms that rely more on such labor. To this end, we examine the role of human capital intensity on post-IPO employment growth. Since our human capital intensity measure is at the industry level, these estimations do not include industry fixed effects.

[Insert Table 7]

Table 7 presents the results. Columns (1), (4), and (7) show the baseline specifications with the indicator *D(High HCI)* and year fixed effects. We note that firms in industries with high human capital intensity experience higher employment growth post-IPO, but the effect is significant only until the end of the first post-IPO year. In Columns (2), (5), and (8) we include controls for size, investment and acquisition activity, R&D, and growth opportunities but do not tabulate them for the sake of brevity. Last, we augment the specification with the interaction between the financial constraints measure *Age* and the measure of human capital intensity. In these specifications, shown in Columns (3), (6), and (9), the coefficient of *D(High HCI)* reflects the effect of going public for the youngest firms (i.e., hypothetical firms with 0 age at IPO). The coefficient of the main effect of *D(High HCI)* is positive, while the coefficient of the interaction term is negative and significant in Columns (3) and (6). It is precisely the youngest firms operating in industries characterized by high human capital intensity that experience the most significant increase in employment growth up to one year after the IPO. While this effect might dissipate when we consider the period of Year 0-2, the coefficient estimates in Column (9) indicate that it is not subsequently reversed.

4.2. Strategy change around the IPO

It is possible that the IPO decision coincides with a stage in the firm's strategy aimed at moving from innovation to commercialization of its products or services. In this case, the observed employment growth could be due to the hiring of production and sales workers needed to expand the scale of operations.

We examine this conjecture using information on the intended use of proceeds (UOP) stated by the IPO firm in its filing prospectus. We identify cases where the stated primary UOP is to finance sales, marketing, commercialization, or working funds/capital. To the extent that these firms are more likely to experience a strategic shift toward production and commercialization, we test whether they exhibit greater employment growth around the IPO. Specifically, we create an indicator *D(UOP Sales)* that takes a value of one if the stated primary UOP is for marketing and sales or working capital, and zero otherwise.[8]

[Insert Table 8]

Table 8 reports the results of the analysis. While the coefficient estimates of *D(UOP Sales)* in Columns (1)-(3) are statistically significant, they become insignificant over longer horizons. The coefficient estimates of the interaction between *D(UOP Sales)* and *Age* suggest that the link between going public with a production and commercialization objective and employment growth is greater for constrained, i.e. younger, firms but the effect is concentrated in the IPO year. Overall, these results suggest that a shift toward commercialization could explain part of the employment growth, mostly in the immediate aftermath of the IPO.

4.3. Mergers and acquisitions activity

Another potential channel for the observed post-IPO employment growth could be related to the enhanced ability of firms to engage in M&As subsequent to going public. Going public to acquire is an important IPO motive as established by Celikyurt et al. (2010). Although the increased ability to conduct M&As and acquire labor is directly related to relaxation of financial constraints, even firms with no significant change in their financial constraints can undertake acquisitions using their publicly listed shares as an acquisition currency. Thus, going public can lead to employment growth not only by improving firms' ability to raise debt and equity capital to

[8] The reported primary uses of proceeds in the sample include 40 different categories. The majority of the stated uses are "General Corp. Purp." To identify firms that are more likely to raise capital for production, we combine the following types: "Working Capital," "Marketing & Sales," "Oper Fund," and "Working Fund."

undertake cash-financed acquisitions but also by allowing them to use publicly traded shares to conduct stock-financed deals.

We consider both cash and stock-financed M&A transactions as a driver of employment growth and explore their effect on employment growth in Table 9.

[Insert Table 9]

Columns (1), (5), and (9) include the value of all cash-financed (*Value 100% Cash*) and all stock-financed (*Value 100% Stock*) acquisitions undertaken by the firm during the IPO year, the first one-year, and two-year post-IPO periods, respectively. The specifications include the basic controls for firm size, investment activity, R&D spending, and growth opportunities. We find that the coefficients for the value of cash and stock-financed acquisitions are significant in explaining employment growth, both in the short term and long term. To the extent that a private firm gains the ability to engage in stock-financed acquisitions only after going public, the results suggest that one channel through which going public could result in employment growth is the creation of an acquisition currency.

Columns (2), (6), and (10) include *Age* and *D(ΔRCC*) to investigate whether our insights about the M&A channel survive after the inclusion of variables linked to financial constraints. The results about the importance of acquisition strategy as a driver of employment growth continue to hold. Importantly, the effects of *Age* and *D(ΔRCC)* remain significant, suggesting that the effect arising from the M&A channel does not eliminate the financial constraints channel.

Our results complement the finding in Bernstein (2015) that the post-IPO deterioration in the internal innovation capability of an IPO firm is partially mitigated through external acquisitions of innovative and entrepreneurial firms. We extend this point beyond the innovation capability of firms to their overall human capital.

4.4. Agency conflicts

We next investigate agency conflicts as a potential driver of post-IPO employment growth. As the firm transitions from private to public, its ownership structure changes with a consequent change in the agency conflicts it faces. Agency problems are likely to increase in the post-IPO period due to increased separation of ownership and control.

To test the impact of agency conflicts due to increased separation of ownership and control in public firms, we begin by using the M&A framework. Existing literature argues that firms may undertake M&A deals with an empire-building agenda and this may result in an excessive level of employment. Different from CAPEX and R&D spending, it is possible to obtain a measure of the quality of a firm's M&A activity by calculating cumulative abnormal returns (CARs) over a short window around an acquisition announcement. Examining the link between the quality of a firm's M&A deals and its employment could help us understand better whether the observed employment growth could be due to agency conflicts that may drive the M&A decision in the first place.

We first calculate CAR of the acquirer over a three-day window around the announcement of each acquisition during the post-IPO horizon.[9] Next, we construct a measure of the total value of cash and stock-financed acquisitions based on whether each acquisition generates a positive or negative CAR. If empire-building M&As play a role for employment growth, we should find that employment growth is positive for M&A transactions with negative announcement returns.

[9] We calculate market adjusted CARs. In additional analyses, we also use CARs adjusted for median industry CARs and obtain qualitatively similar results.

We show the results in Table 9 where we split the acquisitions based on market reaction to their announcement. We present specifications that include the acquisition-related variables and only basic controls in Columns (3), (7), and (11). In Columns (4), (8), and (12) we augment these specifications by adding the measures of financial constraints and their relaxation.

We note that the coefficients of both cash and the stock-financed deals with positive market reactions at announcement are positive and significant in explaining employment growth for all post-IPO horizons. By contrast, we find a weaker relation between cash and stock-financed deals with negative market reaction and employment growth. Stock-financed acquisitions with negative announcement returns are significant in explaining employment growth over the IPO year. This suggests the possibility that part of the early employment growth after going public could be due to the IPO firm's ability to use its acquisition currency to engage in M&As driven by managerial interest rather than shareholder value maximization. However, the significance of the effect disappears over longer post-IPO horizons. Similarly, we find an initial positive effect of cash-financed acquisitions with negative returns but it also disappears over the longer term. Overall, the analysis suggests that the evidence supporting agency conflicts as a driver of employment growth within the context of M&A strategy is weak. By contrast, acquisitions with positive CARs (i.e., those seen as value creating) have a pronounced and robust positive effect on employment growth. In expanding employment, IPO firms seem to use their enhanced ability to undertake acquisitions in a way more consistent with shareholder value maximization motives.

Last, we expand the scope of our agency conflicts analysis by using a second approach that investigates whether the presence of insiders and institutional investors relates to employment growth of IPO firms. Greater insider ownership implies a stronger alignment of managerial motives with those of shareholders. Greater institutional ownership, by institutions that have the ability and incentives to monitor management, could also limit empire building. Hence, analyzing the impact of both insider ownership and institutional investors' presence could shed additional light on the role of agency conflicts as a potential driver of employment growth after the IPO.

For this analysis, we use data on insider holdings from the Thomson Financial Filing Data Files[10] and institutional holdings from the 13F filings in the CDA Spectrum database hosted by Thomson Reuters. With these data we construct an indicator *Insider Ownership* takes a value of one if a firm has above-median ownership by insiders. We also construct an indicator *Institutional Ownership* that takes a value of one if a firm has above-median ownership by 13F institutions.

[Insert Table 10]

The results of the analysis are in Table 10. We find limited evidence that agency conflicts are a key driver of post-IPO employment growth. Firms with higher insider ownership appear to have lower employment growth in almost all specifications but, with the exception of Column (2), the effect is not significant. Higher institutional ownership does not seem to correlate with employment growth in the IPO year and up to one year after the IPO. However, the specification in Column (9) shows lower employment growth over the long term in firms with higher ownership by institutional investors. This is the only instance where we find that either insider ownership or institutional ownership correlate with employment growth and may suggest some beneficial effects from institutions' monitoring over longer horizons. Overall, we do not find strong evidence pointing to agency conflicts channel as a major explanation for employment growth.

[10] To calculate insiders' ownership we rely on SEC Form 4 from Thomson Financial Filing Data Files. Form 4 reports information on daily changes of the ownership position of every insider, i.e. whether the insider bought or sold shares, the number of shares traded and the number of shares owned post-trade. Insider holdings are identified from the resulting positions of all insiders. We only measure direct ownership positions, defined as equity positions held in the insider's name (or in the name of a broker or bank on behalf of the insider) and not indirect ownership positions (ownership of the members of the insider's immediate family).

5. Conclusions

This paper examines the impact of going public on firm-level employment. Our results show that firms exhibit economically meaningful increases in employment growth after their IPO. The positive effect is larger for firms with greater dependence on external equity and in industries that require highly skilled labor. We address endogeneity concerns by using a novel dataset of private firms and an empirical methodology that compares firms with completed IPOs to firms that file for an IPO but withdraw their offering for exogenous reasons. Our results are consistent with a causal impact of going public on firms' ability to expand employment.

We also examine channels that could explain the observed relationship between going public and employment growth. First, the results are consistent with a relaxation of financial constraints due to newly gained access to public capital markets. This is not only due to the equity capital raised at the IPO, but also due to improved access to debt capital that facilitates financing of labor in the long term. Second, we find evidence that part of the employment growth around the IPO could be due to a shift in the business strategy of the firm. Third, we find that the observed post-IPO employment growth is strongly related to the improved ability of firms to pursue both stock and cash-financed acquisitions. Last, we find limited evidence that agency problems are driving the observed employment growth after the IPO.

Overall, this paper emphasizes the importance of access to public capital markets for expanding the human capital of a firm and is supportive of the efforts of policymakers and various initiatives, such as the JOBS Act, aimed at facilitating small and growth-oriented firms' access to public capital markets.

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Appendix A
Variable Definitions and Construction

Log(Emp)	Natural logarithm of firm employment.
ΔLog(Emp) Year X	Change in the natural logarithm of employment during year *X* relative to the year of the firm's event (IPO or withdrawal). For example, *ΔLog(Emp) Year 0* is the change in the log-employment during the IPO (withdrawal) year.
ΔLog(EMP) Year 0-X	Change in the natural logarithm of employment from the beginning of the firm's event year (IPO or withdrawal) to the end of the *X*-th post-event year. For example, *ΔLog(Emp) Year 0-2* is the change in log-employment from beginning of the IPO (withdrawal) year to the end of the second post-IPO (post-withdrawal) year.
Log(Sales)	Natural logarithm of firm sales.
ΔLog(Sales) Year X	Change in the natural logarithm of sales during year *X* relative to the year of the firm's event (IPO or withdrawal). For example, *ΔLog(Sales) Year–1* is the change in log-sales over the year before the IPO (withdrawal) year.
D(Rating)	Indicator variable that takes a value of one if the firm has a PayDex rating and zero otherwise.
Rating(PayDex)	Numerical score assigned by D&B that captures firm's credit worthiness using risk of late payments. The score ranges from zero to 100 with a higher score indicating lower risk.
D(Complete)	Indicator variable that takes a value of one for firms in the NETS IPOs sample and zero for firms in the Withdrawn IPOs sample.
D(High EED)	Indicator variable that takes a value of one if a firm operates in an industry with high external equity dependence (EED) and zero otherwise. EED is computed at industry (two-digit SIC) level using all Compustat firms. For each firm, we compute the ratio of net amount of equity issues [sale of common and preferred stock (SSTK) less purchase of common and preferred stock (PRSTKC)] and investment in capital expenditures (CAPX). We then take the median of the firm-level ratios for all firms in the industry to compute industry measure of dependence. Industries with above-median dependence are categorized as high EED.

D(High HCI)	Indicator variable that takes a value of one if a firm operates in an industry with high human capital intensity (HCI) and zero otherwise. We use three measures of HCI at the industry level. The HCI measure we use in the Tables shown in the paper is constructed using the average annual wage for each industry from the Occupational Employment Statistics of the Bureau of Labor Statistics. We rank all industries based on wages and categorize industries in the top tercile as high HCI. As a robustness test, we use two additional measures of industry-level HCI.
D(High EED & High HCI)	Indicator variable that takes a value of one if a firm operates in an industry with high external equity dependence and high human capital intensity and zero otherwise.
D(High EED & Low HCI)	Indicator variable that takes a value of one if a firm operates in an industry with high external equity dependence and low human capital intensity and zero otherwise.
D(Low EED & High HCI)	Indicator variable that takes a value of one if a firm operates in an industry with low external equity dependence and high human capital intensity and zero otherwise.
D(Low EED & Low HCI)	Indicator variable that takes a value of one if a firm operates in an industry with low external equity dependence and low human capital intensity and zero otherwise.
D(ΔRCC)	Indicator variable that takes a value of one if the change in a firm's relative cost of credit (*RCC*) from the beginning of the IPO year to the year-end of the respective post-IPO year, as outlined in the construction of *ΔLog(EMP) Year 0-X*, is below the 25^{th} percentile of the sample changes and zero otherwise. *RCC* is defined as one plus the cost of credit for the IPO firm scaled by one plus median cost of credit for all Compustat firms for the year. Cost of credit is the ratio of total interest expense (XINT) to total long-term and short-term debt (DLTT + DLC).
Age	Natural logarithm of one plus the number of years between the founding year of the firm and its IPO year.
Log(Proceeds)	Natural logarithm of one plus the amount of primary proceeds raised in the offering scaled by the book value of the firm's pre-IPO total assets.

Pre-IPO Size (Assets)	Natural logarithm of the book value of the firm's total assets expressed in millions of dollars at the beginning of the IPO year.
VC-Backed	Indicator variable that takes a value of one if a firm is backed by VC and zero otherwise.
D(Acquisitions)	Indicator variable that takes a value of one if the amount of Acquisitions (AQC) made by the firm during the relevant time horizon, as outlined in the construction of *ΔLog(EMP) Year 0-X*, scaled by the book value of the firm's pre-IPO total assets is positive and zero otherwise.
Capex/Assets	Sum of all capital expenditures (CAPX) made by the firm during the relevant time horizon, as outlined in the construction of *ΔLog(EMP) Year 0-X*, scaled by the book value of the firm's pre-IPO total assets.
R&D/Assets	Sum of all R&D expenditures (XRD) made by the firm during the relevant time horizon, as outlined in the construction of *ΔLog(EMP) Year 0-X*, scaled by the book value of the firm's pre-IPO total assets. Missing XRD values are replaced with zero.
MB Ratio	Ratio of the market value (MV) of the firm's assets to their book value (AT) as of the end of the IPO year. MV is constructed as fiscal year closing price (PRCC_F) multiplied by common shares outstanding (CSHO) plus total assets (AT) minus common equity (CEQ) and deferred taxes on the balance sheet (TXDB).
D(UOP Sales)	Indicator variable that takes a value of one if the stated primary use of proceeds (UOP) is "Marketing & Sales," "Working Capital," "Oper Fund," or "Working Fund" and zero otherwise.
Value 100% Cash	Sum of the total deal values of all "all cash" acquisitions made by the firm during the relevant time horizon, as outlined in the construction of *ΔLog(EMP) Year 0-X*, scaled by the book value of the firm's pre-IPO total assets.
Value 100% Stock	Sum of the total deal values of all "all stock" acquisitions made by the firm during the relevant time horizon, as outlined in the construction of *ΔLog(EMP) Year 0-X*, scaled by the book value of the firm's pre-IPO total assets.

Value 100% Cash CAR > 0	Sum of the total deal values of all “all cash” acquisitions with positive cumulative abnormal returns (CARs) made by the firm during the relevant time horizon, as outlined in the construction of *ΔLog(EMP) Year 0-X*, scaled by the book value of the firm’s pre-IPO total assets. CAR is the three-day market adjusted return centered at deal announcement date.
Value 100% Stock CAR > 0	Sum of the total deal values of all “all stock” acquisitions with positive CARs made by the firm during the relevant time horizon, as outlined in the construction of *ΔLog(EMP) Year 0-X*, scaled by the book value of the firm’s pre-IPO total assets. CAR is the three-day market adjusted return centered at deal announcement date.
Value 100% Cash CAR < 0	Sum of the total deal values of all “all cash” acquisitions with negative CARs made by the firm during the relevant time horizon, as outlined in the construction of *ΔLog(EMP) Year 0-X*, scaled by the book value of the firm’s pre-IPO total assets. CAR is the three-day market adjusted return centered at deal announcement date.
Value 100% Stock CAR < 0	Sum of the total deal values of all “all stock” acquisitions with negative CARs made by the firm during the relevant time horizon, as outlined in the construction of *ΔLog(EMP) Year 0-X*, scaled by the book value of the firm’s pre-IPO total assets. CAR is the three-day market adjusted return centered at deal announcement date.
Insider Ownership	Indicator variable that takes a value of one if the firm has above-median insider ownership in the post-IPO period and zero otherwise. Insider ownership is obtained from Thomson Financial Filing Data Files.
Institutional Ownership	Indicator variable that takes a value of one if the firm has above-median institutional ownership in the post-IPO period and zero otherwise. Institutional ownership is obtained from 13-F filings in the CDA Spectrum database.

Appendix B

Table A1: Baseline Analysis – First Stage

The table reports the results from the first stage of the IV analysis of the cumulative change in log-employment over various post-IPO horizons presented in Table 2. The estimation uses the NETS IPOs sample and the Withdrawn IPOs sample. Columns (1)-(3) focus on Year 0, columns (4)-(6) on Year 0-1, and columns (7)-(9) on Year 0-2. The dependent variable in all columns is *D(Complete)*: An indicator that takes a value of one if the firm completes the IPO and zero if it withdraws the offering. The instruments are: 1) *Return*: The average daily return on S&P500 over the five trading days with the lowest return during the two-month post-filing period and 2) *Log(Volume)*: The log of the average daily volume on S&P500 during this period. *Log(Sales)* is the log of the sales of the firm, while *ΔLog(Sales)* is the change in the log of the sales of the firm. *D(Rating)* is an indicator that takes a value of one if the firm has a PayDex credit rating and *Rating(PayDex)* is the numerical score of the rating, coded as zero if missing. Appendix A provides detailed definitions of the variables. The table reports coefficient estimates followed by standard errors in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
		Year 0			**Year 0-1**			**Year 0-2**	
	D(Complete)	**D(Complete)**	**D(Complete)**	**D(Complete)**	**D(Complete)**	**D(Complete)**	**D(Complete)**	**D(Complete)**	**D(Complete)**
Log(Volume)	0.747***	0.746***	0.798***	0.743***	0.743***	0.796***	0.765***	0.764***	0.814***
	(0.049)	(0.049)	(0.052)	(0.050)	(0.050)	(0.053)	(0.050)	(0.050)	(0.053)
Return	13.959***	13.947***	12.995***	13.944***	13.931***	13.097***	13.568***	13.555***	12.467***
	(1.287)	(1.287)	(1.359)	(1.301)	(1.301)	(1.373)	(1.347)	(1.348)	(1.429)
Log(Sales)		-0.001	-0.001		-0.001	-0.001		-0.002	-0.002
		(0.003)	(0.003)		(0.003)	(0.003)		(0.003)	(0.003)
ΔLog(Sales)			-0.003			-0.002			-0.001
			(0.007)			(0.007)			(0.007)
D(Rating)			-0.175***			-0.196***			-0.163***
			(0.061)			(0.060)			(0.062)
D(Rating)×Rating(PayDex)			0.002***			0.003***			0.002***
			(0.001)			(0.001)			(0.001)
Constant	-12.744***	-12.699***	-17.079***	-12.681***	-12.642***	-16.296***	-13.110***	-13.054***	-16.844***
	(0.953)	(0.957)	(1.167)	(0.965)	(0.969)	(1.182)	(0.970)	(0.975)	(1.184)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,437	3,437	3,173	3,350	3,350	3,095	3,145	3,145	2,903
R-squared	0.258	0.258	0.265	0.238	0.238	0.249	0.242	0.242	0.254

Table 1: Summary Statistics

The table presents summary statistics for the samples used in the analysis. Panel A reports the measures for the sample of firms that complete an IPO from 1990-2010 and could be matched to the NETS database (NETS IPOs sample). Panel B provides the measures for the sample of firms that file for an IPO from 1990-2010, but subsequently withdraw the offering, and could be matched to the NETS database (Withdrawn IPOs sample). In Panel A, Year -1 is the year before the IPO, Year 0 is the year of the IPO, and Year 0-2 is the period that starts from the year of the IPO and ends two years later. In Panel B, Year -1 is the year before the withdrawn offering, Year 0 is the year during which the offering is withdrawn, and Year 0-2 is the period that starts from the year when the offering is withdrawn and ends two years later. Appendix A provides detailed definitions of the variables. *, **, and *** indicate whether the mean and median of the respective variable for the Withdrawn IPOs sample shown in Panel B are statistically different from the respective values for the completed IPOs (NETS IPOs sample) shown in Panel A at the 10%, 5%, and 1% levels, respectively.

	ΔLog(Emp) Year -1	**ΔLog(Emp) Year 0**	**ΔLog(Emp) Year 0-2**	**ΔLog(Sales) Year -1**	**Log(Sales) Year -1**	**Sales Year -1**	**Log(Emp) Year -1**	**Emp Year -1**	**Rating (PayDex)**
				Panel A: NETS IPOs Sample (Number of Firms = 2,914)					
Mean	0.31	0.38	0.98	0.33	16.21	70,048,941	4.65	620.44	70.82
Median	0.06	0.13	0.68	0.10	16.30	12,017,478	4.61	100.00	72.00
SD	0.72	0.92	1.29	0.81	1.96	455,159,632	1.73	3,676.83	7.47
				Panel B: Withdrawn IPOs Sample (Number of Firms = 536)					
Mean	0.33	0.20***	0.40***	0.35	16.17	100,228,460	4.62	853.75	69.72***
Median	0.00***	0.00***	0.15***	0.06***	16.29	11,856,450	4.60	99.00	71.50
SD	0.94	0.84	1.10	1.00	2.19	447,250,168	1.97	5,547.60	8.19

Table 2: Baseline Analysis

The table reports the results from the IV analysis of the cumulative change in log-employment over various post-IPO horizons. The estimation uses the NETS IPOs sample and the Withdrawn IPOs sample. In Columns (1)-(3), *ΔLog(Emp) Year 0* is the change in the log of employment from the beginning of the event year to the end of the event year. In Columns (4)-(6), *ΔLog(Emp) Year 0-1* is the change in the log of employment from the beginning of the event year to the end of the first post-event year. In Columns (7)-(9), *ΔLog(Emp) Year 0-2* is the change in the log of employment from the beginning of the event year to the end of the second post-event year. The event year (i.e., Year 0) is the year of issue for the NETS IPOs sample and the year of withdrawal for the Withdrawn IPOs sample. The instruments used are: 1) the average daily return on S&P500 over the five trading days with the lowest return during the two-month post-filing period and 2) the log of the average daily volume on S&P500 during this period. *D(Complete)* is an indicator that takes a value of one if the firm completes the IPO and zero if it withdraws the offering. *Log(Sales)* is the log of the sales of the firm, while *ΔLog(Sales)* is the change in the log of the sales of the firm. *D(Rating)* is an indicator that takes a value of one if the firm has a PayDex credit rating and *Rating(PayDex)* is the numerical score of the rating, coded as zero if missing. Appendix A provides detailed definitions of the variables. The table reports coefficient estimates followed by standard errors in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
		ΔLog(Emp) Year 0			**ΔLog(Emp) Year 0-1**			**ΔLog(Emp) Year 0-2**	
D(Complete)	0.556***	0.447***	0.368**	1.165***	0.969***	0.787***	1.255***	1.022***	1.026***
	(0.174)	(0.166)	(0.155)	(0.233)	(0.216)	(0.207)	(0.256)	(0.237)	(0.231)
Log(Sales)		-0.138***	-0.128***		-0.223***	-0.216***		-0.252***	-0.241***
		(0.008)	(0.008)		(0.010)	(0.010)		(0.011)	(0.012)
ΔLog(Sales)			0.005			0.028			0.024
			(0.017)			(0.023)			(0.026)
D(Rating)			-0.442***			-0.603***			-0.393*
			(0.154)			(0.203)			(0.230)
D(Rating)×Rating(PayDex)			0.005**			0.006**			0.002
			(0.002)			(0.003)			(0.003)
Constant	0.189	2.808***	2.689***	0.146	4.401***	4.584***	0.320	5.181***	5.481***
	(0.665)	(0.652)	(0.602)	(0.870)	(0.830)	(0.792)	(0.944)	(0.902)	(0.848)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,437	3,437	3,173	3,350	3,350	3,095	3,145	3,145	2,903
First-stage F statistic	129.74	129.23	127.08	125.92	125.39	123.83	126.70	126.02	124.08
Sargan test (p-value)	0.406	0.313	0.304	0.815	0.720	0.791	0.578	0.358	0.772

Table 3: Dependence on External Equity Financing

The table reports the results from the IV analysis of the cumulative change in log-employment over various post-IPO horizons. The estimation uses the NETS IPOs sample and the Withdrawn IPOs sample. In Columns (1)-(3), *ΔLog(Emp) Year 0* is the change in the log of employment from the beginning of the event year to the end of the event year. In Columns (4)-(6), *ΔLog(Emp) Year 0-1* is the change in the log of employment from the beginning of the event year to the end of the first post-event year. In Columns (7)-(9), *ΔLog(Emp) Year 0-2* is the change in the log of employment from the beginning of the event year to the end of the second post-event year. The event year (i.e., Year 0) is the year of issue for the NETS IPOs sample and the year of withdrawal for the Withdrawn IPOs sample. The instruments used are: 1) the average daily return on S&P500 over the five trading days with the lowest return during the two-month post-filing period, 2) the log of the average daily volume on S&P500 during this period, and 3) the interactions of 1) and 2) with *D(High EED)*. *D(Complete)* is an indicator that takes a value of one if the firm completes the IPO and zero if it withdraws the offering. *Log(Sales)* is the log of the sales of the firm, while *ΔLog(Sales)* is the change in the log of the sales of the firm. *D(Rating)* is an indicator that takes a value of one if the firm has a PayDex credit rating and *Rating(PayDex)* is the numerical score of the rating, coded as zero if missing. *D(High EED)* is an indicator that takes a value of one if the firm is in an industry with high external equity dependence and zero otherwise. Appendix A provides detailed definitions of the variables. The table reports coefficient estimates followed by standard errors in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	ΔLog(Emp) Year 0			ΔLog(Emp) Year 0-1			ΔLog(Emp) Year 0-2		
D(Complete)×D(High EED)	0.807*	0.724*	0.515	1.589**	1.462**	1.479**	2.196***	2.185***	2.082**
	(0.444)	(0.426)	(0.431)	(0.668)	(0.625)	(0.653)	(0.851)	(0.797)	(0.839)
D(Complete)	-0.086	-0.128	-0.047	-0.049	-0.147	-0.299	-0.357	-0.576	-0.482
	(0.378)	(0.362)	(0.364)	(0.545)	(0.509)	(0.527)	(0.675)	(0.633)	(0.661)
D(High EED)	-0.743*	-0.783**	-0.616*	-1.456**	-1.523***	-1.522***	-1.990***	-2.179***	-2.066***
	(0.384)	(0.369)	(0.373)	(0.584)	(0.546)	(0.569)	(0.749)	(0.701)	(0.736)
Log(Sales)		-0.123***	-0.110***		-0.196***	-0.187***		-0.221***	-0.206***
		(0.008)	(0.008)		(0.010)	(0.010)		(0.011)	(0.012)
ΔLog(Sales)			-0.002			0.023			0.018
			(0.017)			(0.024)			(0.027)
D(Rating)			-0.499***			-0.657***			-0.511**
			(0.155)			(0.208)			(0.238)
D(Rating)×Rating(PayDex)			0.005**			0.006**			0.003
			(0.002)			(0.003)			(0.003)
Constant	0.540	2.656***	2.307***	0.630	4.022***	4.133***	1.256**	5.171***	5.490***
	(0.328)	(0.343)	(0.352)	(0.474)	(0.475)	(0.500)	(0.587)	(0.586)	(0.594)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	No	No	No	No	No	No	No
Observations	3,437	3,437	3,173	3,350	3,350	3,095	3,145	3,145	2,903
First-stage F statistic	53.79	53.73	46.96	43.07	42.99	36.48	33.88	33.85	28.57
Sargan test (p-value)	0.203	0.188	0.161	0.636	0.324	0.198	0.696	0.566	0.837

Table 4: Human Capital

The table reports the results from the IV analysis of the cumulative change in log-employment over various post-IPO horizons. The estimation uses the NETS IPOs sample and the Withdrawn IPOs sample. In Columns (1)-(3), *ΔLog(Emp) Year 0* is the change in the log of employment from the beginning of the event year to the end of the event year. In Columns (4)-(6), *ΔLog(Emp) Year 0-1* is the change in the log of employment from the beginning of the event year to the end of the first post-event year. In Columns (7)-(9), *ΔLog(Emp) Year 0-2* is the change in the log of employment from the beginning of the event year to the end of the second post-event year. The event year (i.e., Year 0) is the year of issue for the NETS IPOs sample and the year of withdrawal for the Withdrawn IPOs sample. The instruments used are: 1) the average daily return on S&P500 over the five trading days with the lowest return during the two-month post-filing period, 2) the log of the average daily volume on S&P500 during this period, and 3) the interactions of 1) and 2) with *D(High HCI)*. *D(Complete)* is an indicator that takes a value of one if the firm completes the IPO and zero if it withdraws the offering. *Log(Sales)* is the log of the sales of the firm, while *ΔLog(Sales)* is the change in the log of the sales of the firm. *D(Rating)* is an indicator that takes a value of one if the firm has a PayDex credit rating and *Rating(PayDex)* is the numerical score of the rating, coded as zero if missing. *D(High HCI)* is an indicator that takes a value of one if the firm is in an industry with high human capital intensity and zero otherwise. Appendix A provides detailed definitions of the variables. The table reports coefficient estimates followed by standard errors in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	ΔLog(Emp) Year 0			ΔLog(Emp) Year 0-1			ΔLog(Emp) Year 0-2		
D(Complete)×D(High HCI)	0.805**	0.664**	0.936***	0.990*	0.705	1.158**	1.266**	1.079*	1.244**
	(0.339)	(0.324)	(0.332)	(0.514)	(0.475)	(0.479)	(0.604)	(0.558)	(0.561)
D(Complete)	0.097	0.072	-0.115	0.724**	0.681**	0.374	0.703	0.563	0.556
	(0.249)	(0.239)	(0.237)	(0.359)	(0.332)	(0.324)	(0.428)	(0.397)	(0.388)
D(High HCI)	-0.824***	-0.769***	-0.983***	-1.058**	-0.924**	-1.305***	-1.279**	-1.252**	-1.350***
	(0.293)	(0.280)	(0.286)	(0.448)	(0.414)	(0.416)	(0.529)	(0.489)	(0.491)
Log(Sales)		-0.120***	-0.109***		-0.203***	-0.192***		-0.230***	-0.213***
		(0.008)	(0.008)		(0.010)	(0.011)		(0.012)	(0.013)
ΔLog(Sales)			-0.007			0.023			0.016
			(0.019)			(0.026)			(0.029)
D(Rating)			-0.454***			-0.625***			-0.476*
			(0.166)			(0.219)			(0.249)
D(Rating)×Rating(PayDex)			0.004*			0.006**			0.002
			(0.002)			(0.003)			(0.003)
Constant	0.467**	2.473***	2.391***	0.105	3.485***	3.570***	0.424	4.339***	4.752***
	(0.237)	(0.264)	(0.300)	(0.343)	(0.365)	(0.347)	(0.407)	(0.437)	(0.412)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	No	No	No	No	No	No	No
Observations	3,111	3,111	2,884	3,033	3,033	2,814	2,849	2,849	2,643
First-stage F statistic	46.69	46.64	43.67	39.48	39.44	37.10	40.35	40.41	37.60
Sargan test (p-value)	0.685	0.512	0.778	0.543	0.567	0.461	0.443	0.355	0.646

Table 5: Human Capital and Dependence on External Equity Financing

The table reports the results from the IV analysis of the cumulative change in log-employment over various post-IPO horizons. The estimation uses the NETS IPOs sample and the Withdrawn IPOs sample. In Columns (1)-(3), *ΔLog(Emp) Year 0* is the change in the log of employment from the beginning of the event year to the end of the event year. In Columns (4)-(6), *ΔLog(Emp) Year 0-1* is the change in the log of employment from the beginning of the event year to the end of the first post-event year. In Columns (7)-(9), *ΔLog(Emp) Year 0-2* is the change in the log of employment from the beginning of the event year to the end of the second post-event year. The event year (i.e., Year 0) is the year of issue for the NETS IPOs sample and the year of withdrawal for the Withdrawn IPOs sample. The instruments are: 1) the average daily return on S&P500 over the five trading days with the lowest return during the two-month post-filing period, 2) the log of the average daily volume on S&P500 during this period, and 3) the interactions of 1) and 2) with *D(High EED & High HCI)*, *D(High EED & Low HCI)*, *D(Low EED & High HCI)*, and *D(Low EED & Low HCI)*. *D(Complete)* is an indicator that takes a value of one if the firm completes the IPO and zero if it withdraws the offering. *Log(Sales)* is the log of the sales of the firm, while *ΔLog(Sales)* is the change in log of the sales of the firm. *D(Rating)* is an indicator that takes a value of one if the firm has a PayDex rating and *Rating(PayDex)* is the numerical score of the rating, coded as zero if missing. *D(High EED & High HCI)* is an indicator that takes a value of one if the firm is in an industry with high external equity dependence and high human capital intensity, and zero otherwise. *D(High EED & Low HCI)* is an indicator that takes a value of one if the firm is in an industry with high external equity dependence and low human capital intensity. *D(Low EED & High HCI)* is an indicator that takes a value of one if the firm is in an industry with low external equity dependence and high human capital intensity. *D(Low EED & Low HCI)* is an indicator that takes a value of one if the firm is in an industry with low external equity dependence and low human capital intensity. Appendix A provides detailed definitions of the variables. The table reports coefficient estimates followed by standard errors in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
	ΔLog(Emp) Year 0			**ΔLog(Emp) Year 0-1**			**ΔLog(Emp) Year 0-2**		
D(Complete)×D(High EED & High HCI)	0.930***	0.749***	0.826***	1.798***	1.442***	1.604***	2.087***	1.740***	1.875***
	(0.255)	(0.243)	(0.238)	(0.378)	(0.349)	(0.348)	(0.421)	(0.390)	(0.389)
D(Complete)×D(High EED & Low HCI)	0.480	0.369	0.205	1.541***	1.337***	1.156***	1.999***	1.662***	1.640***
	(0.330)	(0.315)	(0.303)	(0.475)	(0.439)	(0.427)	(0.626)	(0.580)	(0.562)
D(Complete)×D(Low EED & High HCI)	1.321	1.433	1.434	0.939	1.098	0.838	2.362	2.528*	2.491*
	(0.994)	(0.949)	(0.898)	(1.446)	(1.335)	(1.252)	(1.521)	(1.409)	(1.325)
D(Complete)×D(Low EED & Low HCI)	-0.475	-0.441	-0.536	-0.630	-0.551	-0.988	-1.483	-1.501	-1.368
	(0.495)	(0.472)	(0.483)	(0.791)	(0.730)	(0.743)	(1.016)	(0.941)	(0.926)
D(High EED & High HCI)	-1.373***	-1.314***	-1.454***	-2.329***	-2.160***	-2.659***	-3.325***	-3.274***	-3.208***
	(0.476)	(0.453)	(0.474)	(0.800)	(0.738)	(0.765)	(1.031)	(0.955)	(0.950)
D(High EED & Low HCI)	-0.858	-0.826	-0.778	-1.908**	-1.810**	-2.007**	-3.087**	-2.961***	-2.774**
	(0.556)	(0.530)	(0.537)	(0.886)	(0.817)	(0.828)	(1.200)	(1.111)	(1.089)
D(Low EED & High HCI)	-1.650*	-1.753**	-1.783**	-1.635	-1.763	-1.877	-3.527**	-3.753***	-3.364**
	(0.889)	(0.849)	(0.809)	(1.371)	(1.265)	(1.202)	(1.561)	(1.447)	(1.365)
Log(Sales)		-0.124***	-0.113***		-0.206***	-0.194***		-0.233***	-0.215***
		(0.008)	(0.008)		(0.011)	(0.011)		(0.013)	(0.013)
ΔLog(Sales)			-0.006			0.019			0.011
			(0.019)			(0.026)			(0.030)
D(Rating)			-0.410**			-0.581***			-0.421
			(0.165)			(0.223)			(0.257)

D(Rating)×Rating(PayDex)			0.004			0.005*			0.001
			(0.002)			(0.003)			(0.004)
Constant	0.975**	3.048***	2.867***	1.252*	4.664***	4.921***	2.279**	6.235***	6.358***
	(0.433)	(0.439)	(0.431)	(0.693)	(0.668)	(0.697)	(0.891)	(0.862)	(0.785)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	No	No	No	No	No	No	No
Observations	3,101	3,101	2,875	3,028	3,028	2,809	2,845	2,845	2,639
First-stage F statistic	22.04	22.12	20.75	17.29	17.36	15.79	14.06	14.08	13.67
Sargan test (p-value)	0.519	0.339	0.163	0.441	0.285	0.101	0.636	0.601	0.564

Table 6: Channels – Financial Constraints

The table reports the results from the regression analysis of the cumulative change in log-employment over various post-IPO horizons. The estimation uses the Compustat IPOs sample. In Columns (1)-(4), *ΔLog(Emp) Year 0* is the change in the log of employment from the beginning of the IPO year to the end of the IPO year. In Columns (5)-(8), *ΔLog(Emp) Year 0-1* is the change in the log of employment from the beginning of the IPO year to the end of the first post-IPO year. In Columns (9)-(12), *ΔLog(Emp) Year 0-2* is the change in the log of employment from the beginning of the IPO year to the end of the second post-IPO year. *Age* is the log of one plus the number of years between the founding year of the firm and the year of its IPO. *D(ΔRCC)* is an indicator that takes a value of one if the change in the relative cost of credit (RCC) for the IPO firm over the relevant time horizon is below the 25th percentile and zero otherwise. *Log(Proceeds)* is the log of one plus the amount of primary proceeds raised in the offering, scaled by the book value of the firm's pre-IPO assets. Appendix A provides detailed descriptions of the variables. The table reports coefficient estimates followed by robust standard errors in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
		ΔLog(Emp) Year 0				ΔLog(Emp) Year 0-1				ΔLog(Emp) Year 0-2		
Age	-0.090***	-0.041***	-0.031***	-0.023**	-0.134***	-0.062***	-0.045***	-0.047***	-0.157***	-0.078***	-0.071***	-0.069***
	(0.006)	(0.006)	(0.007)	(0.010)	(0.010)	(0.010)	(0.011)	(0.016)	(0.014)	(0.014)	(0.015)	(0.025)
D(ΔRCC)			0.059***	0.048			0.047**	-0.035			0.127***	0.284***
			(0.014)	(0.040)			(0.023)	(0.066)			(0.030)	(0.095)
Log(Proceeds)			0.136***	0.171***			0.073**	0.097			-0.037	-0.089
			(0.022)	(0.045)			(0.036)	(0.073)			(0.056)	(0.134)
Age×D(ΔRCC)				0.004				0.035				-0.066**
				(0.014)				(0.023)				(0.033)
Age×Log(Proceeds)				-0.019				-0.014				0.030
				(0.019)				(0.031)				(0.054)
Pre-IPO Size (Assets)		-0.035***	-0.010*	-0.011**		-0.033***	-0.025***	-0.026***		-0.012	-0.029**	-0.026**
		(0.005)	(0.005)	(0.005)		(0.008)	(0.009)	(0.009)		(0.010)	(0.012)	(0.012)
VC-Backed		0.026**	0.037***	0.039***		0.047**	0.065***	0.065***		0.061**	0.083***	0.080***
		(0.012)	(0.013)	(0.013)		(0.019)	(0.022)	(0.021)		(0.026)	(0.030)	(0.030)
D(Acquisitions)		0.140***	0.127***	0.126***		0.216***	0.219***	0.219***		0.251***	0.271***	0.273***
		(0.014)	(0.015)	(0.015)		(0.019)	(0.022)	(0.022)		(0.025)	(0.029)	(0.029)
Capex/Assets		0.240***	0.170***	0.167***		0.145***	0.142***	0.141***		0.116***	0.121***	0.121***
		(0.024)	(0.027)	(0.028)		(0.016)	(0.017)	(0.017)		(0.012)	(0.016)	(0.016)
R&D/Assets		0.036**	-0.015	-0.016		0.027**	0.005	0.005		0.027***	0.018	0.019
		(0.018)	(0.024)	(0.025)		(0.011)	(0.015)	(0.015)		(0.009)	(0.013)	(0.014)
MB Ratio		0.020***	0.019***	0.019***		0.039***	0.038***	0.038***		0.035***	0.034***	0.034***
		(0.003)	(0.004)	(0.004)		(0.005)	(0.006)	(0.006)		(0.007)	(0.010)	(0.009)
Constant	0.460***	0.288***	0.107	0.101	0.749***	0.324***	-0.125	-0.075	0.158	-0.320**	0.089	0.061
	(0.063)	(0.089)	(0.087)	(0.089)	(0.088)	(0.091)	(0.160)	(0.172)	(0.140)	(0.133)	(0.148)	(0.155)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,498	3,348	2,487	2,487	3,222	3,155	2,308	2,308	2,933	2,891	2,062	2,062
Adjusted R-squared	0.148	0.298	0.301	0.301	0.131	0.296	0.307	0.307	0.102	0.267	0.277	0.278

Table 7: Channels – Human Capital

The table reports the results from the regression analysis of the cumulative change in log-employment over various post-IPO horizons. The estimation uses the Compustat IPOs sample. In Columns (1)-(3), *ΔLog(Emp) Year 0* is the change in the log of employment from the beginning of the IPO year to the end of the IPO year. In Columns (4)-(6), *ΔLog(Emp) Year 0-1* is the change in the log of employment from the beginning of the IPO year to the end of the first post-IPO year. In Columns (7)-(9), *ΔLog(Emp) Year 0-2* is the change in the log of employment from the beginning of the IPO year to the end of the second post-IPO year. *D(High HCI)* is an indicator that takes a value of one if the firm is in an industry with high human capital intensity and zero otherwise. *Age* is the log of one plus the number of years between the founding year of the firm and the year of its IPO. *D(ΔRCC)* is an indicator that takes a value of one if the change in the relative cost of credit (RCC) for the IPO firm over the relevant time horizon is below the 25^{th} percentile and zero otherwise. The set *Controls* includes the following variables: *Pre-IPO Size (Assets)*, *VC-Backed*, *D(Acquisitions)*, *Capex/Assets*, *R&D/Assets*, and *MB Ratio*. Appendix A provides detailed descriptions of the variables. The table reports coefficient estimates followed by robust standard errors in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	ΔLog(Emp) Year 0			**ΔLog(Emp) Year 0-1**			**ΔLog(Emp) Year 0-2**		
D(High HCI)	0.048***	0.016	0.066	0.049**	0.018	0.141**	0.036	0.007	0.065
	(0.013)	(0.013)	(0.043)	(0.021)	(0.021)	(0.067)	(0.029)	(0.028)	(0.097)
Age×D(High HCI)			-0.026*			-0.059***			-0.032
			(0.015)			(0.023)			(0.032)
Age			-0.031***			-0.041***			-0.077***
			(0.009)			(0.013)			(0.020)
D(ΔRCC)			0.054***			0.062**			0.139***
			(0.015)			(0.025)			(0.034)
Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	No	No	No	No	No	No	No
Observations	3,020	2,893	2,028	2,808	2,751	1,888	2,581	2,542	1,695
Adjusted R-squared	0.055	0.260	0.264	0.044	0.263	0.288	0.026	0.226	0.255

Table 8: Channels – Strategic Shift

The table reports the results from the regression analysis of the cumulative change in log-employment over various post-IPO horizons. The estimation uses the Compustat IPOs sample. In Columns (1)-(3), *ΔLog(Emp) Year 0* is the change in the log of employment from the beginning of the IPO year to the end of the IPO year. In Columns (4)-(6), *ΔLog(Emp) Year 0-1* is the change in the log of employment from the beginning of the IPO year to the end of the first post-IPO year. In Columns (7)-(9), *ΔLog(Emp) Year 0-2* is the change in the log of employment from the beginning of the IPO year to the end of the second post-IPO year. *D(UOP Sales)* is an indicator that takes a value of one if the stated primary use of proceeds in the prospectus is for marketing, sales, working funds, or working capital and zero otherwise. *Age* is the log of one plus the number of years between the founding year of the firm and the year of its IPO. *D(ΔRCC)* is an indicator that takes a value of one if the change in the relative cost of credit (RCC) for the IPO firm over the relevant time horizon is below the 25th percentile and zero otherwise. The set *Controls* includes the following variables: *Pre-IPO Size (Assets), VC-Backed*, *D(Acquisitions)*, *Capex/Assets*, *R&D/Assets*, and *MB Ratio*. Appendix A provides detailed descriptions of the variables. The table reports coefficient estimates followed by robust standard errors in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
	ΔLog(Emp) Year 0			**ΔLog(Emp) Year 0-1**			**ΔLog(Emp) Year 0-2**		
D(UOP Sales)	0.123**	0.130***	0.222**	0.123	0.125*	-0.213	0.184	0.127	0.013
	(0.051)	(0.045)	(0.099)	(0.084)	(0.073)	(0.200)	(0.121)	(0.109)	(0.417)
Age×D(UOP Sales)			-0.088**			0.074			0.029
			(0.038)			(0.072)			(0.146)
Age			-0.033***			-0.048***			-0.070***
			(0.007)			(0.011)			(0.015)
D(ΔRCC)			0.055***			0.047**			0.127***
			(0.014)			(0.023)			(0.030)
Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,654	3,494	2,487	3,371	3,301	2,308	3,069	3,024	2,062
Adjusted R-squared	0.088	0.280	0.287	0.077	0.273	0.305	0.054	0.249	0.276

Table 9: Channels – Acquisitions Activity

The table reports the results from the regression analysis of the cumulative change in log-employment over various post-IPO horizons. The estimation uses the Compustat IPOs sample. In Columns (1)-(4), *ΔLog(Emp) Year 0* is the change in the log of employment from the beginning of the IPO year to the end of the IPO year. In Columns (5)-(8), *ΔLog(Emp) Year 0-1* is the change in the log of employment from the beginning of the IPO year to the end of the first post-IPO year. In Columns (9)-(12), *ΔLog(Emp) Year 0-2* is the change in the log of employment from the beginning of the IPO year to the end of the second post-IPO year. *Value 100% Cash* (*Stock*) is the value of all cash (all stock) financed acquisitions made by the firm during the relevant time horizon scaled by the book value of the firm's pre-IPO assets. *Value 100% Cash (Stock) CAR>0* is the total value of all cash (all stock) financed acquisitions with a positive three-day cumulative abnormal return (CAR) made by the firm during the relevant time horizon scaled by the book value of the firm's pre-IPO assets. *Value 100% Cash (Stock) and CAR<0* is the total value of all cash (all stock) financed acquisitions with a negative three-day CAR made by the firm during the relevant time horizon scaled by the book value of the firm's pre-IPO assets. *Age* is the log of one plus the number of years between the founding year of the firm and the year of its IPO. *D(ΔRCC)* is an indicator that takes a value of one if the change in the relative cost of credit (RCC) for the IPO firm over the relevant time horizon is below the 25^{th} percentile and zero otherwise. The set *Controls* includes the following variables: *Pre-IPO Size (Assets)*, *VC-Backed*, *D(Acquisitions)*, *Capex/Assets*, *R&D/Assets*, and *MB Ratio*. Appendix A provides detailed descriptions of the variables. The table reports coefficient estimates followed by robust standard errors in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**
	ΔLog(Emp) Year 0				**ΔLog(Emp) Year 0-1**				**ΔLog(Emp) Year 0-2**			
Value 100% Cash	0.359***	0.337***			0.270***	0.292***			0.272***	0.302***		
	(0.101)	(0.121)			(0.056)	(0.059)			(0.044)	(0.048)		
Value 100% Stock	0.074***	0.072***			0.028***	0.022***			0.014***	0.010**		
	(0.011)	(0.013)			(0.004)	(0.006)			(0.003)	(0.005)		
Value 100% Cash CAR>0			0.673**	0.612**			0.323***	0.344***			0.416***	0.435***
			(0.272)	(0.308)			(0.084)	(0.088)			(0.071)	(0.069)
Value 100% Stock CAR>0			0.235***	0.174**			0.072***	0.069***			0.041***	0.041**
			(0.073)	(0.082)			(0.012)	(0.016)			(0.012)	(0.018)
Value 100% Cash CAR<0			0.974*	1.151			0.539***	0.689***			0.280**	0.265
			(0.519)	(0.712)			(0.164)	(0.212)			(0.111)	(0.173)
Value 100% Stock CAR<0			0.188***	0.193***			0.051***	0.027			0.023***	0.008
			(0.050)	(0.062)			(0.011)	(0.018)			(0.007)	(0.009)
Age		-0.034***		-0.033***		-0.045***		-0.045***		-0.065***		-0.067***
		(0.007)		(0.007)		(0.011)		(0.011)		(0.014)		(0.014)
D(ΔRCC)		0.049***		0.050***		0.047**		0.045**		0.116***		0.113***
		(0.014)		(0.014)		(0.023)		(0.023)		(0.029)		(0.029)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,494	2,487	3,494	2,487	3,301	2,308	3,301	2,308	3,024	2,062	3,024	2,062
Adjusted R-squared	0.293	0.300	0.290	0.297	0.295	0.323	0.300	0.329	0.271	0.300	0.275	0.302

Table 10: Channels – Insiders and Institutional Ownership

The table presents the results from the regression analysis of the cumulative change in log-employment over various post-IPO horizons. The estimation uses Compustat IPOs sample. In columns (1)-(3), *ΔLog(Emp) Year 0* is the change in the log of employment from beginning of the IPO year to the end of the IPO year. In columns (4)-(6), *ΔLog(Emp) Year 0-1* is the change in the log of employment from beginning of the IPO year to the end of the first post-IPO year. In columns (7)-(9), *ΔLog(Emp) Year 0-2* is the change in the log of employment from the beginning of the IPO year to the end of the second post-IPO year. *Insider Ownership* is an indicator variable that takes a value of one if the firm has above-median insider ownership in the post-IPO period. *Institutional Ownership* is an indicator variable that takes a value of one if the firm has above-median institutional ownership. *Age* is the log of one plus the number of years between the founding year of the firm and the year of its IPO. *D(ΔRCC)* is an indicator that takes a value of one if the change in the relative cost of credit (RCC) for the IPO firm over the relevant time horizon is below the 25th percentile and zero otherwise. The set *Controls* includes the following variables: *Pre-IPO Size (Assets)*, *VC-Backed*, *D(Acquisitions)*, *Capex/Assets*, *R&D/Assets*, and *MB Ratio*. Appendix A provides detailed description of the variables. The table reports coefficient estimates followed by robust standard errors in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	ΔLog(Emp) Year 0			ΔLog(Emp) Year 0-1			ΔLog(Emp) Year 0-2		
Insider Ownership	-0.016	-0.026**	-0.034	-0.020	-0.019	0.040	-0.035	-0.037	-0.024
	(0.012)	(0.011)	(0.037)	(0.020)	(0.018)	(0.063)	(0.027)	(0.024)	(0.082)
Institutional Ownership	-0.020*	-0.003	-0.016	-0.010	0.005	-0.051	-0.020	-0.011	-0.172**
	(0.012)	(0.011)	(0.037)	(0.020)	(0.018)	(0.058)	(0.028)	(0.025)	(0.088)
Age×Insider Ownership			0.007			-0.020			-0.002
			(0.013)			(0.022)			(0.029)
Age×Institutional Ownership			0.003			0.016			0.055*
			(0.013)			(0.020)			(0.030)
Age			-0.037***			-0.046***			-0.087***
			(0.010)			(0.015)			(0.019)
D(ΔRCC)			0.055***			0.047**			0.128***
			(0.014)			(0.023)			(0.030)
Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,654	3,494	2,487	3,371	3,301	2,308	3,069	3,024	2,062
Adjusted R-squared	0.087	0.279	0.286	0.076	0.272	0.305	0.054	0.249	0.278

ONLINE APPENDIX

1. Analysis with alternative measures of Human Capital Intensity (HCI).

Table A1: Human Capital – Robustness – Alternative Measures of HCI

The table reports the results (second stage) from the IV analysis of the cumulative change in log-employment over various post-IPO horizons. The estimation uses the NETS IPOs sample and the Withdrawn IPOs sample. In Columns (1)-(3), *ΔLog(Emp) Year 0* is the change in the log of employment from the beginning of the event year to the end of the event year. In Columns (4)-(6), *ΔLog(Emp) Year 0-1* is the change in the log of employment from the beginning of the event year to the end of the first post-event year. In Columns (7)-(9), *ΔLog(Emp) Year 0-2* is the change in the log of employment from the beginning of the event year to the end of the second post-event year. The event year (i.e., Year 0) is the year of issue for the NETS IPOs sample and the year of withdrawal for the Withdrawn IPOs sample. The instruments are: 1) the average daily return on S&P500 over the five trading days with the lowest return during the two-month post-filing period, 2) the log of the average daily volume on S&P500 during this period, and 3) the interactions of 1) and 2) with *D(High HCI)*. *D(High HCI)* is an indicator that takes a value of one if the firm is in an industry with high human capital intensity (HCI) and zero otherwise. In Panel A, the HCI measure is constructed using data on wages and salaries obtained from the National Accounts by the Bureau of Economic Analysis (BEA) and adopted by Philippon and Reshef (2012), while in Panel B we follow Parham (2017) and construct an industry-specific HCI measure using the BLS Education and Training dataset. *D(Complete)* is an indicator that takes a value of one if the firm completes the IPO and zero if it withdraws the offering. *Log(Sales)* is the log of the sales of the firm, while *ΔLog(Sales)* is the change in the log of the sales of the firm. *D(Rating)* is an indicator that takes a value of one if the firm has a PayDex credit rating and *Rating(PayDex)* is the numerical score of the rating coded as zero if missing. Appendix A of the revised paper provides detailed definitions of the variables. The table reports coefficient estimates followed by standard errors in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A – HCI measure using National Accounts data

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	ΔLog(Emp) Year 0			ΔLog(Emp) Year 0-1			ΔLog(Emp) Year 0-2		
D(Complete)×D(High HCI)	0.909**	0.742**	1.114***	1.077*	0.771	1.451***	2.078***	1.885***	2.223***
	(0.376)	(0.358)	(0.371)	(0.585)	(0.538)	(0.552)	(0.698)	(0.642)	(0.660)
D(Complete)	0.001	-0.004	-0.261	0.665	0.642*	0.206	0.270	0.136	0.039
	(0.279)	(0.266)	(0.269)	(0.408)	(0.376)	(0.375)	(0.491)	(0.453)	(0.453)
D(High HCI)	-0.937***	-0.885***	-1.181***	-1.197**	-1.088**	-1.668***	-2.058***	-2.076***	-2.325***
	(0.325)	(0.310)	(0.320)	(0.511)	(0.470)	(0.481)	(0.613)	(0.564)	(0.578)
Log(Sales)		-0.124***	-0.113***		-0.210***	-0.201***		-0.240***	-0.223***
		(0.008)	(0.008)		(0.010)	(0.011)		(0.012)	(0.013)
ΔLog(Sales)			-0.005			0.026			0.014
			(0.019)			(0.026)			(0.030)
D(Rating)			-0.433***			-0.558**			-0.395
			(0.166)			(0.221)			(0.258)
D(Rating)×Rating(PayDex)			0.004*			0.005*			0.001
			(0.002)			(0.003)			(0.004)
Constant	0.566**	2.648***	2.565***	0.210	3.739***	3.867***	0.848*	4.974***	5.470***
	(0.256)	(0.281)	(0.315)	(0.376)	(0.395)	(0.376)	(0.450)	(0.482)	(0.474)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	No	No	No	No	No	No	No
Observations	3,111	3,111	2,884	3,033	3,033	2,814	2,849	2,849	2,643

Panel B – HCI measure using Education and Training data

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	ΔLog(Emp) Year 0			ΔLog(Emp) Year 0-1			ΔLog(Emp) Year 0-2		
D(Complete)×D(High HCI)	0.754**	0.585*	0.953***	0.839	0.531	1.184**	1.734**	1.530**	1.873***
	(0.372)	(0.354)	(0.366)	(0.577)	(0.530)	(0.541)	(0.685)	(0.628)	(0.644)
D(Complete)	0.090	0.086	-0.174	0.796*	0.775**	0.342	0.461	0.331	0.224
	(0.279)	(0.266)	(0.269)	(0.406)	(0.374)	(0.372)	(0.487)	(0.448)	(0.447)
D(High HCI)	-0.824**	-0.769**	-1.066***	-1.027**	-0.913**	-1.477***	-1.810***	-1.817***	-2.076***
	(0.322)	(0.307)	(0.316)	(0.504)	(0.464)	(0.472)	(0.601)	(0.552)	(0.564)
Log(Sales)		-0.125***	-0.114***		-0.211***	-0.202***		-0.241***	-0.225***
		(0.008)	(0.008)		(0.010)	(0.011)		(0.012)	(0.013)
ΔLog(Sales)			-0.003			0.028			0.017
			(0.019)			(0.025)			(0.029)
D(Rating)			-0.446***			-0.579***			-0.418*
			(0.164)			(0.218)			(0.253)
D(Rating)×Rating(PayDex)			0.004*			0.006*			0.002
			(0.002)			(0.003)			(0.003)
Constant	0.508**	2.598***	2.508***	0.130	3.673***	3.810***	0.726	4.870***	5.379***
	(0.255)	(0.281)	(0.313)	(0.374)	(0.393)	(0.374)	(0.446)	(0.476)	(0.467)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	No	No	No	No	No	No	No
Observations	3,111	3,111	2,884	3,033	3,033	2,814	2,849	2,849	2,643

Table A2: Human Capital and External Equity Financing – Robustness – Alternative Measures of HCI

The table reports results (second stage) from the IV analysis of the cumulative change in log-employment over various post-IPO horizons. The estimation uses the NETS IPOs sample and the Withdrawn IPOs sample. In Columns (1)-(3), *ΔLog(Emp) Year 0* is the change in the log of employment from the beginning of the event year to the end of the event year. In Columns (4)-(6), *ΔLog(Emp) Year 0-1* is the change in the log of employment from the beginning of the event year to the end of the first post-event year. In Columns (7)-(9), *ΔLog(Emp) Year 0-2* is the change in the log of employment from the beginning of the event year to the end of the second post-event year. The event year (i.e., Year 0) is the year of issue for the NETS IPOs sample and the year of withdrawal for the Withdrawn IPOs sample. The instruments are: 1) the average daily return on S&P500 over the five trading days with the lowest return during the two-month post-filing period, 2) the log of the average daily volume on S&P500 during this period, and 3) the interactions of 1) and 2) with *D(High EED & High HCI)*, *D(High EED & Low HCI)*, and *D(Low EED & High HCI)*. *D(Complete)* is an indicator that takes a value of one if the firm completes the IPO and zero if it withdraws the offering. *D(High EED & High HCI)* is an indicator that takes a value of one if the firm is in an industry with high external equity dependence and high human capital intensity and zero otherwise. *D(High EED & Low HCI)* is an indicator that takes a value of one if the firm is in an industry with high external equity dependence and low human capital intensity. *D(Low EED & High HCI)* is an indicator that takes a value of one if the firm is in an industry with high external equity dependence and high human capital intensity. The omitted category is *D(Low EED & Low HCI)*, which is an indicator that takes a value of one if the firm is in an industry with low external equity dependence and low human capital intensity. In Panel A, the HCI measure is constructed using data on wages and salaries obtained from the National Accounts by the Bureau of Economic Analysis (BEA) and adopted by Philippon and Reshef (2012), while in Panel B we follow Parham (2017) and construct an industry-specific HCI measure using the BLS Education and Training dataset. *Log(Sales)* is the log of the total sales of the firm, while *ΔLog(Sales)* is the change in the log of the total sales of the firm. *D(Rating)* is an indicator that takes a value of one if the firm has a PayDex credit rating and *Rating(PayDex)* is the numerical score of the rating coded as zero if missing. Appendix A of the revised paper provides detailed definitions of the variables. The table reports coefficient estimates followed by standard errors in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A – HCI measure using National Accounts data

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		ΔLog(Emp) Year 0			ΔLog(Emp) Year 0-1			ΔLog(Emp) Year 0-2	
D(Complete)×D(High EED&High HCI)	0.985***	0.792***	0.898***	1.912***	1.553***	1.791***	2.490***	2.123***	2.299***
	(0.254)	(0.241)	(0.238)	(0.389)	(0.358)	(0.363)	(0.443)	(0.410)	(0.412)
D(Complete)×D(High EED&Low HCI)	0.417	0.368	0.064	1.624***	1.514***	1.207**	1.598**	1.441**	1.230*
	(0.376)	(0.358)	(0.350)	(0.561)	(0.517)	(0.518)	(0.758)	(0.704)	(0.699)
D(Complete)×D(Low EED&High HCI)	0.794	0.955	1.053*	0.684	0.945	1.073	1.968*	2.330**	2.443***
	(0.637)	(0.607)	(0.571)	(0.911)	(0.840)	(0.803)	(1.062)	(0.987)	(0.931)
D(Complete)×D(Low EED&Low HCI)	-0.499	-0.509	-0.445	-0.747	-0.771	-1.251	-1.776	-2.043*	-1.698
	(0.553)	(0.526)	(0.540)	(0.936)	(0.862)	(0.891)	(1.201)	(1.115)	(1.092)
D(High EED & High HCI)	-1.459***	-1.442***	-1.468***	-2.553***	-2.492***	-3.104***	-3.952***	-4.132***	-3.920***
	(0.534)	(0.509)	(0.533)	(0.952)	(0.877)	(0.922)	(1.216)	(1.128)	(1.117)
D(High EED & Low HCI)	-0.818	-0.861	-0.562	-2.002*	-2.048**	-2.182**	-2.902**	-3.126**	-2.598*
	(0.628)	(0.598)	(0.611)	(1.065)	(0.981)	(1.016)	(1.454)	(1.348)	(1.331)
D(Low EED & High HCI)	-1.349*	-1.550**	-1.540**	-1.524	-1.861*	-2.354**	-3.540**	-4.208***	-3.831***
	(0.720)	(0.685)	(0.670)	(1.161)	(1.069)	(1.067)	(1.455)	(1.353)	(1.299)
Log(Sales)		-0.126***	-0.116***		-0.210***	-0.200***		-0.240***	-0.222***
		(0.008)	(0.008)		(0.011)	(0.011)		(0.013)	(0.014)
ΔLog(Sales)			-0.003			0.021			0.008
			(0.019)			(0.026)			(0.031)
D(Rating)			-0.394**			-0.502**			-0.351
			(0.166)			(0.227)			(0.264)
D(Rating)×Rating(PayDex)			0.003			0.004			0.001
			(0.002)			(0.003)			(0.004)
Constant	1.021**	3.174***	2.858***	1.376*	4.962***	5.222***	2.552**	6.861***	6.815***
	(0.478)	(0.476)	(0.461)	(0.812)	(0.766)	(0.814)	(1.043)	(1.003)	(0.906)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	No	No	No	No	No	No	No
Observations	3,101	3,101	2,875	3,028	3,028	2,809	2,845	2,845	2,639
R-squared	-0.020	0.076	0.058	-0.075	0.088	0.045	-0.158	0.004	-0.018

Panel B – HCI measure using Education and Training data

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	ΔLog(Emp) Year 0			ΔLog(Emp) Year 0-1			ΔLog(Emp) Year 0-2		
D(Complete)×D(High EED&High HCI)	0.909***	0.715***	0.813***	1.774***	1.414***	1.629***	2.279***	1.901***	2.088***
	(0.249)	(0.237)	(0.232)	(0.377)	(0.348)	(0.350)	(0.426)	(0.394)	(0.395)
D(Complete)×D(High EED&Low HCI)	0.556	0.504	0.205	1.879***	1.763***	1.441***	1.967**	1.798**	1.615**
	(0.382)	(0.364)	(0.355)	(0.568)	(0.524)	(0.523)	(0.765)	(0.710)	(0.707)
D(Complete)×D(Low EED&High HCI)	0.663	0.863	1.012	0.626	0.960	1.086	2.069*	2.524**	2.629**
	(0.712)	(0.679)	(0.627)	(1.023)	(0.943)	(0.882)	(1.187)	(1.103)	(1.023)
D(Complete)×D(Low EED&Low HCI)	-0.430	-0.443	-0.439	-0.660	-0.693	-1.163	-1.623	-1.882*	-1.642
	(0.525)	(0.500)	(0.515)	(0.871)	(0.802)	(0.829)	(1.097)	(1.017)	(1.006)
D(High EED & High HCI)	-1.337***	-1.321***	-1.392***	-2.367***	-2.314***	-2.900***	-3.649***	-3.812***	-3.708***
	(0.508)	(0.483)	(0.508)	(0.884)	(0.815)	(0.855)	(1.106)	(1.025)	(1.024)
D(High EED & Low HCI)	-0.846	-0.894	-0.645	-2.104**	-2.163**	-2.270**	-3.029**	-3.247**	-2.833**
	(0.609)	(0.579)	(0.592)	(1.012)	(0.932)	(0.963)	(1.364)	(1.264)	(1.259)
D(Low EED & High HCI)	-1.169	-1.412**	-1.490**	-1.405	-1.824*	-2.311**	-3.490**	-4.247***	-3.952***
	(0.742)	(0.707)	(0.678)	(1.169)	(1.078)	(1.054)	(1.441)	(1.340)	(1.276)
Log(Sales)		-0.126***	-0.116***		-0.210***	-0.201***		-0.241***	-0.224***
		(0.008)	(0.008)		(0.011)	(0.011)		(0.013)	(0.013)
ΔLog(Sales)			-0.001			0.023			0.011
			(0.019)			(0.026)			(0.030)
D(Rating)			-0.408**			-0.525**			-0.376
			(0.164)			(0.224)			(0.260)
D(Rating)×Rating(PayDex)			0.004			0.005			0.001
			(0.002)			(0.003)			(0.004)
Constant	0.961**	3.119***	2.830***	1.306*	4.904***	5.167***	2.423**	6.736***	6.767***
	(0.456)	(0.455)	(0.445)	(0.757)	(0.718)	(0.762)	(0.955)	(0.920)	(0.840)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	No	No	No	No	No	No	No
Observations	3,101	3,101	2,875	3,028	3,028	2,809	2,845	2,845	2,639
R-squared	-0.007	0.087	0.073	-0.058	0.102	0.070	-0.124	0.034	0.013