Going Entrepreneurial? IPOs and New Firm Creation

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Abstract

Using matched employee-employer data from the US Census, we examine the impact of a successful initial public offering (IPOs) on a firm's existing employees and their future career choices. Using an instrumental variables strategy, we find strong evidence that going public induces employees to depart for start-ups. Moreover, this result is specific to start-ups. We find no change in the rate of employee departures to established firms. We suggest and find evidence consistent with two non-mutually exclusive mechanisms which can explain this pattern. First, following an IPO, many employees who received large stock grants in the past are able to cash out. This shock to employee wealth may allow employees to better tolerate the risks associated with joining a start-up. Alternatively, employees may leave following an undesirable cultural change following the IPO. Our results suggest that the recent secular decline in IPO activity and new firm creation in the U.S. may be causally linked. The recent decline in IPOs means fewer workers move to startups, decreasing overall new firm creation in the economy.

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Start-ups are important to the economy, both in terms of job creation and productivity growth (Decker et al (2014); Haltiwanger et al (2013)). As such, understanding the drivers of entrepreneurship and new firm creation is an important and growing area of research. This is particularly true now given the documented decline in the rate of new firm creation in the U.S. (Haltwianger et al (2014)). In this paper, we focus on the role of the IPO market and the firm's choice to go public as a possible driver of new firm creation. In particular, we ask whether employees are more likely to depart a firm to join a startup after their current firm goes public.

Startups created by people who leave paid employment is an important driver of new firm creation. Moreover, as identified in Gompers, Lerner and Scharfstein (2005), employees from young public firms are relatively more likely to join a new-start up as compared to employees at more established public firms. Understanding what drives the employee decision to leave a firm to move to a startup, which Gompers, Lerner, and Scharfstein term "entrepreneurial spawning" can help to shed light on the incentives and frictions in the economy that impact total start-up activity. On average for our sample of firms, 4.7% of employees depart to join start-ups over 3 years, relative to total ex-ante employment. For firms that complete their IPO, this jumps to 17.5%, implying that the average rate of workers who exit to join startups almost quadruples for a firm that completes an IPO filing.

Given our interest in understanding the drivers behind entrepreneurial spawning, we use a sample of high-tech firms, industries where Gompers, Lerner and Scharfstein (2005) find significant entrepreneurial spawning. We then focus on the event of going public as this provides us with a dramatic shock to the culture at young firms as well as to the wealth of employees who were granted stock options. To allow inference regarding the shock of going public, as opposed to firm characteristics correlated with the decision to file for an IPO, we focus on a set of firms which all filed an IPO prospectus and then compare results between those firms which succeeded in going public as compared to those firms which withdrew their IPO filing.

However, this step alone is insufficient to allow for clean inference. The decision to withdraw an IPO is driven by the firm's success during the book building phase, the period immediately following the IPO filing. If, during this time, the firm fails to receive sufficient

investor interest at prices acceptable to the issuing firm, the IPO is more likely to be withdrawn. This probability will depend on both the quality of the IPO firm and the overall performance of the market during this period (Busaba, Benveniste and Gao (2001); Benveniste et al (2003); Edelen and Kadlec (2005); Dunbar and Foerster (2008); and Bernstein (2015)).

Thus, to ensure that our results looking at IPO completion do not reflect endogenous firm quality, we follow an instrumental variable approach, as in Bernstein (2015). We use NASDAQ stock market returns in the 60 day window immediately following the IPO filing to instrument for IPO completion. Lower NASDAQ returns are associated with a significant decrease in the probability of IPO success. While market returns can predict employee turnover due to the correlation between returns and employment opportunities, the instrument uses returns only in the short post-IPO filing window. As such, we are able to control for returns more generally using year fixed effects. There is no direct reason why returns over a short window, after controlling for returns over the year, would impact future entrepreneurship. Moreover, we directly test this assumption by running a placebo test using returns in the 90 day period prior to the IPO filing. We find returns during this window neither predict IPO success nor entrepreneurial spawning.

In an OLS setting, there is no relation between IPO completion and employees departing for entrepreneurship. However, after we instrument for the IPO, we observe a post-IPO increase in employees departing to join start-ups. This holds if we limit the sample to only entrepreneurs which appear to be "founding" the start-up, as identified by being a top five wage earner at the new firm, or if we normalize by all employees at IPO firm prior to the filing or by employee departures following the filing. The IV results suggest that the shock of the IPO impacts employee future career decisions. The difference in the OLS and IV results suggests that firm quality is associated with fewer employee departures to start-ups.

While we cannot quantify the precise cost of employee departures to the IPO firms, we have reasons to believe these departures can have negative implications. To the extent that wages measure an employee's contribution to the firm, then employees who depart to start-ups are valuable. Employees who leave for start-ups have higher average wages compared to the average wage of employees who depart for established firms. Moreover, losing entrepreneurial minded employees may be particularly damaging for firms that are still depending on innovation

to meet expectations of exponential growth over the following years. Finally, these departing employees may be taking ideas out of the IPO firm and helping to launch new rivals.

While we are specifically interested in employees departing to start-ups, we also look at changes to the rates at which employees depart to established firms or, more generally, separate from the firm around the IPO event. We also document changes in gross employment and wages around the IPO event. It is critical to explore the full set of changes impacting employees around the IPO event to better understand the opportunity set available to the employees who then decide to leave and join a start-up. We find strong changes in turnover (decreases), turnover to established firms (decreases), total firm employment (increases), and wage growth (increases) following an IPO in an OLS regression. However, once we instrument for the IPO, only the employment result remains. These results suggest that the IPO event has a uniquely salient effect on employees who are entrepreneurial-minded, after controlling for firm quality.

We suggest two non-mutually exclusive mechanisms which can explain this pattern. First, following an IPO, many employees who received large stock grants in the past are able to cash out. To identify evidence in support of this mechanism, we consider a subsample of our data. We look at firms which announced their IPO following high industry returns as stock grants previously made to employees in these firms are likely to have relatively higher values. As predicted, we find a stronger effect when using just firms in the top half of the sample by prior industry returns. If we further limit the sample to just those employees in the top half of the firm's ex-ante wage distribution, those employees most likely to have received past stock grants, then the difference is even more striking. This shock to employee wealth may allow employees to better tolerate the risks associated with joining a new start-up.

Alternatively, employees may leave due to a changed culture following the IPO. The IPO can change the culture at the firm and employees most likely to match to a start-up (high risk tolerance employees) should be most likely to then depart. We proxy for risk tolerance by age and gender. We find no differences in the treatment effect by employee age. However, we find a significantly stronger treatment effect when looking at only male workers.

The rest of the paper proceeds as follows. The next section describes the data. The following section presents the main findings. The final section concludes.

1. Data and Sample Characteristics

In the following section, we review the multiple databases used to create our sample. We provide summary statistics of the firms included in our sample and discuss the calculations of key variables.

1.1. Databases

We combine databases from the following sources to form our estimation sample: Thompson's SDC; the US Census Bureau; and DowJones' VentureSource.

1.1.1. SDC Data

We use Thomson's SDC to identify all IPO filings between 1992 and 2003 and whether the IPO was successfully completed or later withdrawn. We start in 1992 and stop in 2003 to match the time series of available data from Census sources and allow for a two-year pre- and post- event window. Following the literature, we exclude IPO filings of financial firms (SIC codes between 6000 and 6999), unit offers, closed-end funds (including REITs), ADRs, limited partnerships, special acquisition vehicles, spin-offs, and issues of non-common shares.

Using these restrictions, we identify 5,149 complete IPOs and 1,360 withdrawn IPO filings during this period. The SDC database contains information on the firm name, address, EIN and date of filing. EIN is missing for 922 firms. When possible, we fill in missing EIN information by obtaining the EIN from the underlying SEC filing, typically an S-1 or S-1A. This leaves us with a sample of 4,850 IPO filings.[1]

We use a separate database provided by SDC to identify all M&A of firms in our IPO filing sample. We match across databases using CUSIP of the issuing firms. We find that over the three years following an IPO filing, 21% of the firms in our IPO filing sample are acquired. We define a successful acquisition when the deal is completed and the post-acquisition ownership percentage exceeds 50%.

1.1.2. Census Data

[1] We cannot obtain EINs for all IPOs, since some IPO filings that are reported in SDC as being issued by domestic are actually issued by foreign companies, which we exclude. Because some firms change EIN in the process of becoming public, some issuers never report EIN number in the S-1/S-1A filings. Additionally, a few small issuers do not file an S-1 or S-1A.

The Longitudinal Employer-Household Dynamics data (LEHD) is one of the key Census database used in the study to track employees over time. LEHD data are collected from the unemployment insurance records of states participating in the program.[2] Data start in 1990 for several states and coverage of states increases over time. Our project has access to 25 states: Arkansas, Georgia, Hawaii, Iowa, Idaho, Illinois, Indiana, Louisiana, Maryland, Maine, Montana, North Carolina, New Jersey, New Mexico, Nevada, Oklahoma, Oregon, Rhode Island, South Carolina Tennessee, Utah, Virginia, Vermont, Washington and Wisconsin. While we do not observe data for all states, for any state in the program, we observe all employees at firms with at least one paid employee. For each individual we observe quarterly wages and current place of employment.

The Longitudinal Business Database (LBD) is the second key Census database used in the study to track firms over time. The LBD is a panel dataset that tracks all U.S. business establishments with at least one employee and positive payroll.[3] An establishment is any separate physical location operated by a firm with at least one paid employee. The LBD contains information on the number of employees working for an establishment and total annual establishment payroll. In addition, the LBD also contains a unique firm-level identifier, firmid, which links establishments that are part of the same firm. From the LBD, we are able to identify firm age and the physical location and industry for each business establishment.

We link the LEHD to firm identifiers in the Longitudinal Business Database (LBD) using the employer identification numbers (EIN). Matching between the LBD and the LEHD is an imperfect process because the LBD infrastructure is based on physical establishments while the LEHD infrastructure uses reporting units for a given firm within a given state, called State Employer Identification Numbers (SEIN), and these reporting units may or may not match the physical establishments identified in the LBD. As such, we do not track whether an individual stays at the same physical establishment over time, only if the individual remains at the firm.

We link our IPO filing sample to the Census data using EIN in the year the firm first files for an IPO. In unreported results, we verify that our results do not change when we restrict to firms that are also matched by firm name. Moreover, since firms may change EIN numbers

[2] See Abowd et al. (2006) for a more detailed description of the program and the underlying data sets that it generates.
[3] See Jarmin and Miranda (2002) for more information.

around an IPO filing, we also verify that our results are not sensitive to excluding firms that do not change EINs form the year before the filing.

1.1.2. Venture Capital Data

We identify firms which received venture capital funding using both SDC Thomson (VentureXpert) and DowJones (VentureSource). We employ a crosswalk developed by Puri and Zarutskie (2012), which employs a name and address matching algorithm to link to firms in the LBD. Specifically, we identify firms as VC-financed if they can be matched to firms contained in VentureXpert or VentureSource and received VC financing prior to the IPO filing.

1.2. Variable Construction

We start by taking a snapshot of all employees working at a given firm as of the end of the quarter prior to the quarter in which the IPO filing takes place. As discussed earlier, the data is limited to workers physically located in the 25 US states participating in the LEHD program. For firms with establishments located across multiple states, we will have data for workers in some states, such as Illinois, but not in other states, such as California.

Using longitudinally consistent individual identifiers available in the LEHD data, we then track these employees over time. We again take a second snapshot of these same workers, but 3 years later, and identify the following groups: 1) employees who remain working for the original firm; 2) employees who are now employed at a different firm and this firm is less than or equal to 3 years old (or established during or after the initial IPO filing year); 3) employees who are now employed at a different firm and this firm is more than 3 years old; and, 4) employees who are no longer observed in the data. Employees may leave the data either because they leave the work force or they are now employed in an area outside of the LEHD coverage.

We use the LBD to measure firm age. Firm age is equal to the age of the oldest establishment that the firm owns in the first year the firm is observed in the LBD (Haltiwanger (2012)). This definition of firm age is robust to misclassifying an establishment that changes

ownership through mergers and acquisitions as a firm birth, since a firm is defined as a new firm only when all the establishments at the firm are new establishments.[4]

Percent_entrepreneurship_all is defined as the fraction of the employees observed at the firm prior to the IPO filing who leave the firm and are employed at a start-up (firm with age less than or equal to 3 years old) in the post-period.

Percent_entrepreneurship_turnover uses the same numerator, employees observed at the firm prior to the IPO filing and who leave the firm and are employed at a start-up (firm with age less than or equal to 3 years old) in the post-period. However, in this measure, we normalize by the number of employees observed at the firm prior to the IPO filing and who leave the firm in the post period to either become employed at a firm of known age or drop out of the employment sample.5

The two measures of entrepreneurship are complimentary. Percent_entrepreneurship_all measures the percent of employees who depart a given firm to join start-ups. This measures the net impact of an IPO on worker flow into start-ups. Alternatively, percent_entrepreneurship_turnover measures the rate at which employees who depart, leave for new jobs at start-ups.

1.3. Summary Statistics

Given our interest in understanding the drivers behind the entrepreneurial spawning observed in Gompers, Lerner and Scharfstein (2005), we use a sample of high-tech firms. We define high-tech as firm operating in the biotech or computer industries. A firm is in the "Biotech" industry if its primary SIC code is 2830-2839, 3826, 3841-3851, 5047, 5048, 5122, 6324, 7352, 8000-8099, or 8730-8739 excluding 8732. A firm is in the "Computers" industry if its primary SIC code is 5370-5379, 5044, 5045, 5734, or 7370-7379. Because the variable *percent_entrepreneurship_turnover* is undefined in cases where we observe zero employee

[4] The LBD only covers employer firms and does not include Schedule C self-employed activity. As such, the commencement of Schedule C self-employed activity is unmeasured and is not considered to be entrepreneurship in this sample.

[5] There are a small number of firms where we are unable to identify firm age due to differences in coverage between the LEHD and the LBD, as well as imperfect match between the two dataset. LEHD includes some self-employment activity as well as some public organizations, while LBD does not. To ensure that employees joining these firms for which we cannot identify age are not driving our findings, we also consider an alternative normalization where we divide by all employees who separate from the IPO filing firm over the 3 year window. The results are similar and are available by request from the authors.

turnover, we drop a small number of firms from our sample where this condition holds. This allows us to have a constant sample across regressions. Our final sample consists of 760 firms.

Table 1 reports summary statistics for our primary sample. In Panel A, we explore firm characteristics. In the first column, we report the mean, the kernel-weighted mean (in brackets) and standard deviation (in parentheses) of firm-level characteristics for the full sample of firms. The kernel-weighted mean is estimated using placing a 99% weight on observations within the interquartile range and a 1% weight on the remaining observations. We report a kernel-weighted mean to approximate a median since Census disclosure guidelines do not allow reporting of percentile values.[6] In the second column, we limit the sample to firms which withdraw their IPOs. In the third column, we limit the sample to firms which successfully complete their IPOs. In the fourth column, we report the difference between means in columns 2 and 3. Finally, in the fifth column, we denote statistical significance of the difference in means, using robust standard errors.

We find that 73% of the firms in our sample successfully completed their IPO. In the full sample, 67% of the firms are identified as being VC-backed. We report no statistically significant difference in VC-backing between firms which successfully complete their IPOs and firms which subsequently withdraw their IPO filing. Likewise, we find that firms in our sample which complete and withdraw IPOs are similar in terms of total employees, total payroll and firm age. However, firms with completed IPOs have slightly lower average ex-ante wages per employee. Wages are reported as annual wages per employee and include all forms of compensation, such as salaries, wages, commissions, and bonuses. Firm-level wages can be measured using data available in the LBD or in the LEHD. Wages estimated using LBD data covers all employees in the firm and is calculated as the sum of total payroll at each of the firm's establishments divided by total employment at each of the firm's establishments. Wages estimated using the LEHD data are estimated only on those workers in states covered by the LEHD and is aggregated to the firm level, starting with individual data.

We measure NASDAQ market returns around the IPO filing using the following three windows: 60 days after the IPO filing, 90 days prior to the IPO filing, and returns between the initial filing and final resolution (a successful or withdrawn IPO). Average 60 day post-issuance NASDAQ returns at firms which complete their IPO are 3% as compared to -3% for firms which

[6] The kernel-weighted mean is not estimated for indicator variables.

withdraw their IPO. These results are consistent with a number of earlier studies documenting the role of market returns in IPO success (Busaba, Benveniste and Gao (2001); Benveniste et al (2003); Edelen and Kadlec (2005); Dunbar and Foerster (2008); and Bernstein (2015)). We find similar differences when we consider returns to resolution. We also find a small difference in pre-filing returns between the two groups.

Panel B explores firm characteristics, as provided in the Individual Characteristics File (ICF) under the LEHD program. We find that workers at firms which successfully complete their IPO tend to be younger, more likely to be born in the state in which they are currently employed, and have more years of schooling.[7] We find no difference in the fraction of employees who are female, white, foreign-born or in the average employee tenure.[8]

Panel C reports summary statistics for our measures of entrepreneurship and employee turnover. On average, 4.7% of employees leave an IPO filing firm in the 3 years post-filing to join a start-up. This can be contrasted to the fact that 23.6% of employees leave to join an established firm (4 years of age or more) and 15.4% of employees who leave to join firms for which we are unable to determine firm age. An additional 29.2% of workers exit the LEHD sample. This may occur because the worker becomes unemployed, retires, or moves to a state which is not covered by the LEHD program. Only 26.7% of the employees who were present at the firm prior to the IPO filing remain employed at the firm 3 years later.

Comparing between firms with successful and withdrawn IPOs, we see no differences in rates of entrepreneurship. This is true if we normalize our measure by all ex-ante employees, perecent_entrepreneurship_all, or if we normalize by all workers who move to a firm of known age or drop from the LEHD sample, percent_entrepreneurship_turnover. We also report results for an alternative measure of percent_entrepreneurship_turnover where we also include workers who leave to join firms on unknown age in the denominator, percent_entrepreneurship_turnover_alt and find similar results.[9] We do see a difference in the percent of workers who stay at the IPO filing firms and the percent of workers who move to established firms. If the IPO is successful, the retention rate increases to 30% of ex-ante

[7] The Census imputes the education variable. As such, this estimate may be noisy.
[8] Our measurement of tenure is left-hand censored due to data availability. States enter the LEHD program over time, limiting our observed worker-level history.
[9] Throughout the paper, we also use this variable as a robustness test wherever percent_enterpreneurship_turnover is used. Results are similar.

workers. For firms with withdrawn firms, less than 18% of ex-ante employees remain three years later. Following a withdrawn IPO, workers are over 7 percentage points more likely to join an established firm.

Panel D explores wages and wage growth. In this panel, we measure wages using only the set of the firm's employees that are observed in the LEHD data. We limit this sample to employees observed in the LEHD to be able to identify differences between employees who remain employed at the IPO filing firm and employees who leave over the 3 year window. As reported in Panel A, using the full set of LEHD employees, we find that workers at firms which successfully completed their IPO pay workers slightly lower wages, on average. However firms with successful IPOs see higher future wages and higher future wage growth. On average, workers at firms in our sample experience a nearly 5% wage growth from the IPO filing year to the subsequent year. If the IPO was successful, this rate increases to 8%. For firms with withdrawn IPOs, we observe a decline in wages of over 3%.

Our measure of average wage change includes all employees, regardless of whether they remain or depart the original firm. This ensures that there are no differences in the composition of workers in the pre- and post-samples.[10] To assist in the inference, we next look at the subset of LEHD workers which separate from the IPO filing firm within the 3 year window following the filing. We find that workers which subsequently leave the firm have lower ex-ante wages, as compared to the full set of workers. Moreover, we find a similar difference between workers at firms with successful IPOs and firms with withdrawn IPOs. Workers which subsequently leave the firm earn, on average, 7% lower ex-ante wages if employed at a firm with a successful IPO. This difference between firms with successful and unsuccessful IPOs is more pronounced as compared to in the full sample, suggesting that departing employees at least partially drive the results in the full sample. In unreported results, we also document that of the workers who leave, workers who leave and subsequently join a start-up have the highest ex-ante wages.

On average, workers who leave an IPO filing firm realize negative wage growth. However, workers who separate from firms with successful IPOs realize a less negative wage growth as compared to workers who separate from firms with withdrawn IPOs.

[10] Alternatively, we also measure wage change using the LBD data and only workers employed at the firm in the ex-ante and post period. We observe similar patterns with this alternative measure.

Finally, we document a relatively stable employment, on average, for the full sample. However, this is masking striking differences between firms with successful and unsuccessful IPOs. Firms with successful IPOs experience a 4% employment increase over the following 12 months. Firms which later withdraw their IPO filing instead realize negative 18% employment growth, on average. This is consistent with Borisov, Ellul, and Sevilir (2015).

2. Results

In this section, we report results from regressing the percent of employees who leave a firm to enter into entrepreneurship on a completed IPO. We first report results using an OLS methodology. We follow with results using an instrumental variables 2SLS methodology.

2.1. OLS Entrepreneurship Results

In Table 2, we explore the relationship between departures to entrepreneurship and a successfully completed IPO using the following specification:

$$Y_i = \alpha + \beta_1 IPO_i + X_i'\delta_i + \mu_t + \vartheta_k + \varepsilon_i \qquad (1)$$

where Y_i measures the number of employees who depart and join a start-up within 3 years of the IPO filing normalized by either the number of employees at the firm ex-ante, percent_entrepreneurship_all, (columns 1-4) or by the number of employees who leave for other career opportunities, percent_entrepreneurship_turnover, (columns 5-8). IPO_i is a dummy variable which assumes a value of 1 if the IPO was successfully completed, X_i' is a vector of control variables, μ_t are year fixed effects, ϑ_k are SIC1 industry fixed effects and ε_i is the error term. Observations are measured at the firm level and robust standard errors are reported.

Columns 1 and 5 report an economically small and statistically insignificant coefficient on IPO, indicating no significant relationship between departures to start-ups and IPO completion. Columns 2 and 6 add SIC1 industry fixed effects. Columns 3 and 7 include year times industry fixed effects. The inclusion of additional fixed effects has little impact on the coefficient on IPO. Finally, columns 4 and 8 include time varying firm level controls as well as year and industry fixed effects. We control for firm size (the natural logarithm of the count of total employment in the first quarter of the year of the IPO filing), firm wages (the natural

logarithm of the average firm annualized wages), firm average worker age, percent of female workers, average worker education (years of schooling), 90-day NASDAQ return prior to filing, and a dummy variable which identifies IPO filers which are acquired in the three year window post-IPO filing. In this multivariate setting, we now document a negative and significant correlation between firm total employment and IPO completion. As in the univariate statistics, we continue to observe a negative and statistically significant relation between ex-ante wages and IPO completion. We find no significant relationship between the remaining variables and IPO success. Moreover, we continue to find an insignificant coefficient on IPO, even after controlling for time-varying firm characteristics.

These results can be interpreted in two possible ways. A successful IPO completion may have no impact on employee departures to start-ups. Alternatively, a successful IPO completion may indeed impact employee departures to start-ups, however, differences between firms with successful and unsuccessful IPOs also impact employee departures to start-ups, counteracting the effect of the IPO completion. In the following section, we instrument for the IPO completion allowing us to distinguish between these two interpretations.

2.2. IV Entrepreneurship Results

The success of a firm at bookbuilding, following an IPO filing, will depend on both aggregate market conditions as well as on the firm's expected future growth opportunities. Due to greater promotion opportunities, employees may be less likely to leave a firm with greater future prospects. To allow for clean inference of the impact of an IPO completion on employee departures to start-ups, we instrument for the IPO using NASDAQ returns in the 60 days following the IPO filing, an approach based on Bernstein (2015).

To validate that NASDAQ returns in the 60 day window following an IPO filing predict successful IPO completions, we estimate the following regression:

$$IPO_i = \alpha + \beta_1 NASDAQ\_RET_i + X_i'\delta_i + \mu_t + \vartheta_k + \varepsilon_i \qquad (2)$$

where IPO_i is a dummy variable which assumes a value of 1 if the IPO was successfully completed. $NASDAQ\_RET_i$ is the cumulative value-weighted NASDAQ returns over a 60 day window, starting the day of the IPO filing , X_i' is a vector of control variables, μ_t are year fixed

effects, ϑ_k are SIC1 industry fixed effects and ε_i is the error term. Observations are measured at the firm-level and robust standard errors are reported.

Table 3 reports the results. In column 1, we include year fixed effects. Column 2 adds industry fixed effects. Column 3 includes industry times year fixed effects and Column 4 includes additional firm-level controls. In all four regression specifications, there is a strong and positive relationship between 60 day NASDAQ returns and whether or not the IPO was successfully completed. A decline of one standard deviation in NASDAQ returns translates into a decline of 6% in the likelihood of completing the IPO. Moreover, the *F*-statistic ranges from 11-12, exceeding the threshold of $F = 10$ and suggesting that the instrument is strong and unlikely to be biased toward the OLS estimates (Bond, Jaueger, and Baker (1995), Staiger and Stock (1997)).

In order to be a valid instrument, the IV must also meet the exclusion restriction condition. In the case of our specification, we must argue that 60 day NASDAQ returns do not directly impact the rate of employee departures to start-ups except through the IPO completion channel. It is important to stress here that while NASDAQ returns may predict future entrepreneurship directly, by including year fixed effects we are controlling for this correlation between macroeconomic trends and future entrepreneurship. Our identification rests on the fact that it is the returns during a short window immediately following the IPO filing which specifically predict IPO success. It is unlikely that returns during this short window will directly predict future entrepreneurship except through the channel of reflecting broader macroeconomic trends, trends which are controlled for in our analysis with year fixed effects. However, we further validate this assumption in Section 2.7 by using a placebo test. We show that returns during a similar short window of time, but a window which strictly *precedes* the IPO filing, neither predict IPO completion nor future entrepreneurship, after controlling for year fixed effects.

Having validated our instrument, we now proceed with the second stage of our 2SLS estimate. We run the following baseline regression:

$$Y_i = \alpha + \beta_1 \widehat{IPO}_i + X_i'\delta_i + \mu_t + \vartheta_k + \varepsilon_i \qquad (3)$$

where Y_i measures the number of employees who depart and join a start-up within 3 years of the IPO filing normalized by either the number of employees at the firm ex-ante, percent_entrepreneurship_all, (columns 1-4) or by the number of employees who leave for other career opportunities, percent_entrepreneurship_turnover, (columns 5-8). $\widehat{IPO}_i$ is estimated in the first stage (equation 2), X_i' is a vector of control variables, μ_t are year fixed effects, ϑ_k are SIC1 industry fixed effects and ε_i is the error term. Observations are measured at the firm.

We report results of the causal impact of IPO completion on employee departures to start-ups in Table 4. Columns 1 and 5 report a positive and statistically insignificant coefficient on instrumented IPO completion, indicating a causal relationship between IPO completion and employee departures to start-ups. Columns 2 and 6 add SIC1 industry fixed effects. Columns 3 and 7 include year times industry fixed effects. The inclusion of additional fixed effects has little impact on the coefficient on IPO. Finally, columns 4 and 8 include time varying firm level controls as well as year and industry fixed effects. We find a significant coefficient on IPO, even after controlling for time-varying firm characteristics.

The estimates in Table 4 show not only a statistically significant causal relationship between IPO completion and employee departures to start-ups but also an economically significant relationship. On average for our sample of firms, 4.7% of employees depart to join start-ups over 3 years, relative to total ex-ante employment. For firms that complete their IPO, this jumps to 17.5%, implying that the average rate of worker who exit to join startups almost quadruples for a marginal firm that completes an IPO filing. We also document that this is not driven by an overall increase in turnover and constant percentages of employees departing for start-ups. On average for our sample of firms, 7.6% of employees depart to join start-ups over 3 years, relative to total turnover. For firms that complete their IPO, this jumps to 24.3%, a three-fold increase form the mean rate of 7.6%.

These results provide a striking contrast to the results estimated using an OLS methodology in Table 2. After controlling for the endogenous relation between firm quality and IPO success, the relation between IPO success and future entrepreneurship becomes both statistically significant and economically meaningful. The difference in the two results suggests that employees are less likely to depart to start-ups at high quality firms. This correlation between firm quality and future entrepreneurship masks the causal relationship between IPO

success and future entrepreneurship in the OLS regressions, which can only be observed in the IV setting.

While we show important economic magnitudes, there are limits to the generalizability of our results. Given that our instrumental variables regression is measured on those firms whose decision to complete the IPO is conditional on NASDAQ stock market performance during the bookbuilding period, we are cautious about over-generalizing our results. Those firms for which the market demand for the firms' IPO shares is little impacted by overall market trends, presumably the firms with the strongest future growth prospects, may experience different post-IPO trends in turnover and departures to start-ups.

In Table 5, we explore variants of our employee departure to start-ups variables, showing the results are robust to alternative measures. All columns in Table 5 have the same controls and are estimated using the same 2SLS methodology used in Table 4.

In Column 1, he dependent variable is the number of new firms associated with workers employed at the IPO filing firm during the quarter prior to the IPO filing who become entrepreneurs in the 3 years following the IPO filing, normalized by the number of workers who leave the firm. This dependent variable allows us to interpret the macroeconomic effects of IPOs. It is possible that employees departing a given IPO filer may depart in a group to a new firm. In which case, the IPO filer may lose a significant number of employees but only one new start-up will be affiliated with the IPO filer. We observe a positive and significant coefficient on IPO indicating that team starts are not driving the results. Employees departing IPO filers leave for a number of different unique start-ups. We document similar results in column 3 where the dependent variable is the number of new start-ups, normalized by employees who leave to join firms of known age or drop from the LEHD sample.

In Column 2, the dependent variable is the fraction of workers at the IPO filing firm who become entrepreneurs in the 3 years following the IPO filing and are one of the top 5 paid employees at the start-up, normalized by ex-ante employment at the IPO filing firm. By limiting the sample to workers who are among the top earners of the start-up, we seek to estimate whether the IPO completion specifically impacts the rates of departure for those workers who are founding start-ups as compared to workers who are joining as rank-and-file workers at new enterprises. As evidenced by the coefficient on IPO, we find to find a positive and statistically significant relationship between IPO completion and rates of entrepreneurship. We show similar

results in Column 4 where we instead normalize by employees who depart to firms of known age or drop from the LEHD sample.

2.3. Turnover Results

We next turn to more general measures of worker turnover. To understand the incentives for employees to leave following an IPO and join a start-up it is important to consider other changes the IPO will have to the employee's opportunity set. Does the IPO increase the frequency at which employees leave in general? Or leave and join established firms? Or is there an increase in employees who drop from the LEHD sample following a successful IPO suggesting an increase in the number of employees who have voluntarily or involuntarily left labor force? Understanding the answer to these questions will help to understand whether the IPO changes the desirability of remaining at the filing firm in general and whether or not it affects the desirability or availability of other alternative opportunities.

Table 6 reports the results. In Columns 1-3, we report results using an OLS methodology. In Columns 4-6, we report results using the IV methodology as described in earlier tables. In Columns 1 and 4, the dependent variable is the percent of employees observed ex-ante that remain employed at the firm in the post period. Column 1 shows a nearly 11 percentage points increase in employees who remain at the IPO filing firm if the IPO is successful. This is an economically meaningful estimate given only 27% of ex ante employees remain in the post period at the average sample firm. However, once we control for the endogeneity of IPO success, then the result becomes insignificant (Column 4). Taken together, these results suggest that overall employee turnover is lower at firms with higher quality. Furthermore, the changes which occur at a firm following an IPO, in net, do not appear to have an overall significant relation on the propensity to remain employed at the firm for the average ex ante employee.

Columns 2 and 5 explore the percent of ex-ante employees who leave to join established firms (firms of 4 years or greater) following the IPO. The OLS regression shows a strong decline of nearly 8 percentage points in the probability of leaving the filing firm and joining an established firm. Again, this represents a meaningful change given the sample average rate of joining an established firm of 24%. However, once we control for the endogeneity of the IPO completion, the relation is no longer significant. These results show a consistent story with the

percent of employees who remain employed at the filing firm. Better quality firms have greater employee retention and lower departures to other established firms. Moreover, the IPO itself appears to have no net casual impact on departures to established firms.

Columns 3 and 6 explore the percent of workers who leave the LEHD sample following an IPO. Workers may leave the LEHD sample because they become temporarily unemployed, leave labor force, or move to a state which is not covered in our LEHD data. Using either the OLS or IV methodology, we find no significant change in employee departures from a firm and out of the LEHD sample.

2.4. Total Employment Results

Next, we explore changes in total employment around the IPO event. Changes in total employment can provide insight into the labor needs of the firm. If employment declines post-IPO, then our results on changes in entrepreneurism may reflect employees who were either forced out of the firm or who anticipated limited career opportunities at their existing firm and hence sought out alternative employment options, such as start-ups. For example, Babina (2015) shows that following periods of firm financial distress, employees are more likely to exit to found new firms. On the other hand, if employment is increasing post-IPO this could signal a firm with strong career and promotion opportunities. An employee leaving such a firm to join a start-up is making this decision in light of potentially large opportunity costs.

Table 7 reports the results. In Columns 1-3, we report results using an OLS methodology. In Columns 4-6, we report results using the IV methodology as described in earlier tables. In Columns 1 and 4, the dependent variable is ex-ante total firm employment. Column 1 shows that firms with successful IPOs are larger, by employee count, prior to the IPO filing.[11] However, this result loses significance once we instrument for the IPO in Column 4.

Columns 2 and 5 explore one year employment growth following the IPO. The OLS regression shows a one year employment growth rate that is 17 percentage points greater at firms which successfully complete their IPO. The IV regression shows a similar point estimate, however, the result is not statistically significant. Columns 3 and 6 explore three year employment growth following the IPO. Both the OLS and IV regressions show a positive,

[11] This result differs from the finding in Table 1 where univariate statistics show no significant difference in ex-ante employment between successful IPO firms and firms which withdraw their IPOs indicating the importance of controlling for other firm characteristics in this regression.

statistically significant and economically important increase in employment growth following the IPO. If anything, the IV results suggest that after controlling for the endogeneity of IPO completion, future employment growth is even stronger. The capital inflow associated with an IPO may be more critical to future expansion plans for firms of marginal quality where NASDAQ returns will have the greatest influence on IPO completion, the same firms upon which our IV identification rests.

Combining these results of an average increase in employment with the finding of no decrease in employee turnover suggests that following an IPO event, firms do not, on average, increase forced separations. As such, the workers we observe who leave following the IPO to join a new start-up are more likely pursuing these opportunities out of choice and not because they were forced out of their previous employer.

2.5. Wage Results

In the following section we explore changes in wages around the IPO event. Changes in wages provide the final clue in understanding the opportunity set available to workers who then chose to leave their current employer and join a new start-up. Results are reported in Table 8.

Table 8 reports the results. In Columns 1-4, we report results using an OLS methodology. In Columns 5-8, we report results using the IV methodology as described in earlier tables. In Columns 1 and 4, the dependent variable is ex ante average firm wages, aggregated based on individual wages for all employees covered in the LEHD. Using both methodologies, the coefficient on IPO is statistically insignificant.

Columns 2 and 5 explore thee year wage growth following the IPO. Firm-level average wage growth is estimated by aggregating the wage change for all individuals at the firm, observed in the ex-ante window, and covered in the LEHD data. OLS results show a positive and statistically significant coefficient on IPO while the IV results show an insignificant coefficient. Taken together, these results are consistent with positive assertive matching. The IPO dummy in the OLS regression proxies for firm quality and better employees, employees who receive higher wage growth, match to these better firms. However, there appears to be no causal impact of the IPO event itself on average firm wages.

Wage changes in Columns 2 and 5 are estimated for all employees observed at an IPO filing firm in the quarter before the filing. As such, any changes in wages will not reflect

changes in the composition of a firm's workforce. However, this estimate includes wage changes for workers who are no longer employed at the original IPO filing firm. We thus consider two alternative approaches to measuring wage change. In Columns 3 and 6 we estimate wage change, again using the LEHD data, but use only those employees who left the original IPO filing firm. Comparing the results in Columns 2(5) with results in Columns 3(6) allows us to infer the differential wage path for both stayers and employees who separate from their original employer. In columns 3 and 6 we observe a statically and more importantly economically insignificant coefficient on IPO. These results suggest that the changes in wages observed in Columns 2 and 5 is driven by employees who remain at the IPO filing firm.

Finally, we consider one additional measure of wage change. In Columns 4 and 8 we measure wage change using LBD data. By using LBD data, we are able to include information on all employees of a firm, not just those employees in states covered by the LEHD program and includes both, pre-IPO workers and new hires after the IPO filing. Second, we aggregate this information from establishment-level data on total payroll and total employment, as such the estimation is specific to employees employed at the IPO filing firm. The drawback of this approach is that we cannot confirm that the employees whose wages are measured in the pre-period are the same employees observed in the post-period. As such, any wage change could be a consequence of changes to the composition of the firm's workforce or to changes in wages for the average employee. The results in Columns 4(8) are similar to those reported in Columns 2(5) suggesting that post-IPO the firm does not make significant changes in the composition of its workforce by pay level.

In sum, the turnover, total employment and wage results all suggest that the IPO itself has either no significant net causal impact on employment opportunities or expectations within the firm. Or, given the employment results, that the IPO potentially improves the prospects for employees. We find no evidence that employment opportunities or expectations decline for the average employee following a successful IPO, as compared to the opportunities and expectations present before the IPO.

2.6. Potential Mechanisms

In the following section, we explore different potential drivers of our key finding that rates of entrepreneurship increase following an IPO. We first consider a wealth shock mechanism. We next consider a culture shock mechanism.

2.6.1. Wealth Shock Mechanism

An IPO event can involve a large wealth shock for existing employees. Employees in pre-IPO firms are often granted options in lieu of additional cash compensation. This can be a particularly valuable strategy in firms with large growth options and limited cash, such as pre-IPO firms (Core and Guay, 2001). While most firms don't disclose the total number of stock options which have previously been granted to employees who remain with the firm, we can gauge the magnitude of these holdings by looking at total existing options outstanding. At a typical start-up, these shares are held primarily by current and former employees and early investors. Using a sample of 897 IPOs issued in the late 1990s, Pukthuanthong, Roll and Walker (2007) find that the average IPO issuing firm has existing options outstanding (primarily held by VC firms, founders and employees) equal to 48% of the shares offered in the IPO.

Following an IPO, the existence of a publicly traded market makes it easier for employees to sell their shares. While some firms do allow employees with vested option to sell their options prior to the IPO, for most employees there are limited pre-IPO selling options. This represents a significant shock to the wealth of employees with grants. This new wealth may allow employees to better tolerate the risks associated with joining a new start-up. Start-ups impose high employment risk on their employees, as in Haltiwanger, Jarmin, and Miranda (2012). Moreover, start-ups on average cannot match the wage growth at more established firms. In unreported results, we document that the average wage growth for employees leaving an IPO filer to go to a start-up decreases, relative to wage growth experienced by employees who remain at the IPO filer or move to older firms.

To identify evidence consistent with this mechanism, we divide our sample by pre-filing industry returns. Under the assumption that industry returns are correlated with the change in valuation for the pre-IPO firm, then employees at firms in industries that experienced a run-up prior to their IPO filing and received grants in the previous years will have a larger wealth shock following the IPO event. Returns are measured at the 3 SIC-level, using the two year window which strictly precedes the IPO filing year. We define high and low prior industry returns by

dividing the sample at the each year into industries with the returns above and below median industry return. The mean industry return in our sample is 14.3%.

Table 9 reports results by subsamples. Columns 1-3 include the firms in the high prior industry return sample. Columns 4-6 include the firms in the low prior industry return sample. Columns 1 and 4 report first-stage regressions. Columns 2 and 5 report second stage results using percent_entrepreneurship_turnover. We only report results using the normalization by total turnover as different firms and employee groups across the samples may have different rates of turnover[12]. All columns include time varying firm level controls as well as year and industry fixed effects. Consistent with the wealth shock mechanism, we document a higher point estimate of the treatment effect in the high past industry return sample. However, we are cautious against over-interpreting the results given the noticeably weaker power of the instrument in the subset of low prior industry returns.

To document further evidence consistent with the wealth shock mechanism, we next repeat the regressions in Columns 2 and 5 but using only those employees in the top ½ of the firm's ex-ante wage distribution. Presumably, workers in the top ½ of the firm's wage distribution are more likely to receive a significant fraction of stock options. Thus, the wealth shock mechanism would predict that we would observe a greater divergence in the treatment effect between the high- and low- past industry return industry subsamples, when looking only at the high wage employees. Indeed Columns 3 and 6 report a greater divergence in the point estimates on IPO within the subset of high-wage workers.

2.6.2. Culture Shock Mechanism

Start-ups are typically associated with a unique culture. As a firm completes an IPO, this culture may change. Moreover, the addition of new shareholders may change priorities in the firm. For example, Asker, Ljungqvist and Farre-Mensa (2015) find that public firms are more focused on short-term goals.

Jovanovic (1979), Holmes and Schmitz (1990) and Ouimet and Zarutskie (2014) argue that individuals with characteristics best suited for work at a start-up will sort themselves into these firms. Gradual changes in the firm may not encourage these employees to depart. However, a large change, such as the act of going public, in combination with past smaller but

[12] In undisclosed results, we find similar results using alternative normalizations.

cumulative changes in the culture, may lead employees who are particularly entrepreneurial to leave their existing employer for a new start-up opportunity.

We assume relatively higher risk tolerance is associated with a greater likelihood for a given worker to elect to work at a start-up. We assume that younger workers and male workers will be associated with greater risk tolerance, on average. We measure entrepreneurship normalized by all employees who depart to join firms of known age or to exit the LEHD sample as different worker characteristics may be associated with different rates of turnover. [13] All columns include the following controls: year and industry fixed effect and additional controls for time varying firm characteristics. IPO is instrumented using post-filing returns. The same firms are used in all regressions.

Column 1 is estimated using employee in the top 1/2 of the firm's age distribution, as of the quarter prior to the IPO filing. Column 2 is estimated using employees in the bottom 1/2 of the firm's age distribution, as of the quarter prior to the IPO filing. Column 3 is estimated using only male employees. Column 4 is estimated using only female employees.

We find a modest difference in the magnitude of the treatment effect between older and younger employees. The lack of any difference between the two subsets may be driven by a combination of an age effect (predicting a stronger treatment effect at younger employees) and a wealth shock where older employees are more likely to receive options (predicting a stronger treatment effect at employees more likely to have received significant stock options). However, we note stark differences in the treatment effect when comparing between the male and female results, consistent with the culture shock mechanism.

We also divide the sample by whether or not the firm was VC-backed prior to the IPO filing. The culture shock following an IPO may be larger at non VC-backed firms as VC firms may have instituted a culture change themselves upon joining. Unfortunately, the small number of IPO filing firms in our sample which are not VC-backed limits our statistical power. We observe statistically insignificant estimates of the treatment effect in both the only VC-backed and only non VC-backed samples. However, we note that the magnitudes of the coefficients are economically larger in the sample of non-VC backed firms

2.7. Robustness Tests

[13] Similar results hold if we use alternative normalizations of the rate of entrepreneurship.

To validate that the exclusion restriction is met, we consider the following placebo test. We look at the relationship between entrepreneurship rates and NASDAQ returns using the 3 month window *prior to* the IPO filing, on the same sample of firms. We argue that returns prior to the IPO filing should have no impact on entrepreneurship rates, after controlling for annual returns using year fixed effects. Indeed, this is confirmed in Table 10.

Column 1 reports the first stage results. There is no significant relationship between returns prior to the IPO filing and IPO success. Columns 2 and 3 report second stage results where the dependent variable is the count of employees who leave the IPO filing firm and join a start-up in the 3 years following the IPO filing. In Column 2, this variable is scaled by all employees at the IPO filing firm, as measured in the quarter prior to the IPO filing. In Column 3, this variable is scaled by all employees who leave the firm during this 3 year window. All Columns include year and industry fixed effects as well as additional firm characteristics as controls. After instrumenting for IPO success with NASDAQ returns prior to the IPO filing, we find no statistical relationship between IPO success and future rates of entrepreneurship. These results give additional validity to our assumption that there is no direct relationship between post-filing IPO returns and entrepreneurship rates, after controlling for annual returns.

3. Conclusion

In this paper, we focus on the role of the IPO market and the firm's choice to go public as a possible driver of new firm creation. In particular, we ask whether employees are more likely to depart a firm to join a startup after their current firm goes public. We find that employees are significantly more likely to leave for startups when their firm goes public, but only after instrumenting for whether the firm completes the IPO process.

We suggest two non-mutually exclusive mechanisms which can explain this pattern. First, following an IPO, many employees who received large stock grants in the past are able to cash out. This shock to employee wealth may allow employees to better tolerate the risks associated with joining a new start-up. Alternatively, employees may anticipate a cultural shock following the IPO. Consistent with the first mechanism, we find IPO completion is a more significant predictor of employee departures to start-ups when limiting the sample to firms which had previously realized strong industry returns (where employee stock options have presumably risen in value) and simultaneously limiting the sample to employees to employees in the top ½ of

the firm's wage distribution (presumably those employees most likely to have stock options). Consistent with the second mechanism, we find IPO completion is a more significant predictor of employee departures to start-ups when looking only at male employees, where previous studies have found that men are more risk tolerant, on average, and thus may be best-matched to a start-up culture.

Our results are unique to workers leaving for start-ups. We find no change in employee departures to established firms following the IPO, after controlling for firm quality. We also document no changes to wages following the IPO, after controlling for firm quality. However, we do observe an increase in employment post-IPO suggesting some of the capital raised is then used to expand the scale of the firm. While we focus on high-tech firms in this paper, we confirm similar results on a broader sample of IPO firms.

Finally, our results suggest that the recent decline in IPOs means fewer workers move to startups, decreasing overall new firm creation in the economy. This has important implications for the future growth, dynamism and productivity of the US economy.

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Appendix Table 1. Variable Definitions.

All continuous variables are winsorized at 1/99% percentiles.

FIRM VARIABLES

IPO – An indicator variable which equals one if a firm completes an initial public offering

VC Backed – An indicator variable which assumes the value of 1 if the firm received VC investment prior to the IPO filing, as identified in either VentureXpert or VentureSource using a name and address matching algorithm.

Firm Employment - Total firm employment calculated as the sum of employment of all firm's establishments in the LBD

Firm Payroll - Total firm payroll calculated as the sum of payroll of all firm's establishments in the LBD (in thousands)

Average Wages (LBD) - Average firm wage calculated as the ratio of Firm Payroll to Firm Employment, measured the year before the IPO filing (in thousands).

Average Wages (LEHD) - Average annualized quarterly wages of the firm's workers available in the LEHD, measured one quarter before the IPO filing (in thousands).

Average Wages of Departing Employees (LEHD) - Average annualized quarterly wages of the firm's workers who subsequently separate from the IPO filing firm over the 3 year window, measured one quarter before the IPO filing (in thousands).

Average Future Wages (LEHD) - Average annualized wages of the firm's workers in the LEHD one quarter before the event quarter, where earnings are total real earnings earned over 3 years following the IPO filing quarter.

Average Future Wages of Departing Employees (LEHD) - Average annualized wages of the firm's workers in the LEHD one quarter before the event quarter and who subsequently separate from the IPO filing firm over the 3 year window, where earnings are total real earnings earned over 3 years following the IPO filing quarter.

Average Wage Growth (LEHD) - Average wage growth for all workers at the firm one quarter before the event quarter as compared to the average wages over the following 3 years.

Average Wage Growth of Departing Employees (LEHD) - Average wage growth for all workers at the firm one quarter before the event quarter as compared to the average wages over the following 3 years, using only those employees who subsequently separate from the IPO filing firm over the 3 year window

Firm Age - Firm age calculated as the age of the oldest establishment owned by the firm using the LBD.

Acq_after_ipo_in3yrs – An indicator variable which assumes a value of 1 if the firm is acquired over 3 years following the filing.

STOCK RETURNS VARIABLES

Return_60after – Cumulative NASDAQ stock returns over the 60 days following an initial IPO filing.

Return_90before – Cumulative NASDAQ stock returns over the 90 days prior to an initial IPO filing.

Return_resolution - Cumulative NASDAQ stock return from the date of the initial IPO filing to IPO completion or withdrawal. If completion or withdrawal status is missing, completion period is set to 270 days.

WORKER VARIABLES

Average Worker Age - Average employee age estimated using all the firm's employees available in the LEHD.

Percent Female - Percent of the workforce that is female, estimated using all of the firm's employees available in the LEHD.

Percent White - Percent of the workforce that is white, estimated using all of the firm's employees available in the LEHD.

Percent Foreign-Born - Percent of the workforce that was born outside of the US, estimated using all of the firm's employees available in the LEHD.

Percent Born in State - Percent of the workforce that was born within the current state, estimated using all of the firm's employees available in the LEHD.

Average Education - Average number of years of education, estimated using all of the firm's employees available in the LEHD. This variable is imputed in the LEHD data.

Average Tenure - Average number of years of tenure at the current SEIN, estimated using all of the firm's employees available in the LEHD.

ENTREPRENEUR VARIABLES

Percent_entrepreneurship_all - The fraction of firm workers who become entrepreneurs in 3 years (join firms of age 3 years or less) after we identify them at a given firm and normalized by the beginning of period employment - measured one quarter before the event quarter.

Percent_entrepreneurship_turnover - The fraction of firm workers who become entrepreneurs in 3 years (join firms of age 3 years or less) after we identify them at a given firm and normalized by the number of workers who move to a firm with a known age or drop out from the employment sample.

Percent_entrepreneurship_turnover_alt - The fraction of firm workers who become entrepreneurs in 3 years (join firms of age 3 years or less) after we identify them at a given firm and normalized by the number of workers who separate from the firm.

Number_firms_all – The number of new firms associated with workers from the IPO filing firm who become entrepreneurs in the 3 years after the IPO filing, normalized by the beginning of period employment.

Number_firms_turnover – The number of new firms associated with workers from the IPO filing firm who become entrepreneurs in the 3 years after the IPO filing, normalized by the number of workers who move to a firm with a known age or drop out from the employment sample.

Percent_entrepreneurship_all_top5 - The fraction of a firm workers who become entrepreneurs in 3 years (join firms of age 3 years or less) and are one of the top 5 earners normalized by the beginning of period employment - measured one quarter before the event quarter.

Percent_entrepreneurship_turnover_top5 - The fraction of a firm workers who become entrepreneurs in 3 years (join firms of age 3 years or less) and are one of the top 5 earners normalized by the number of workers who move to a firm with a known age or drop out from the employment sample.

TURNOVER VARIABLES

Percent_stay – The fraction of firm workers who in 3 years since the event quarter stay with the firm

Percent_move_older_firm - The fraction of firm workers who in 3 years since the event quarter move to a firm with age more than 3 years

Percent_move_unknown_firm_age - The fraction of firm workers who in 3 years since the event quarter move to a firm with undefined age

Percent_move_unemployed - fraction of firm workers who in 3 years since the event quarter drop out from the employment sample.

Table 1. Summary Statistics. Panel A. Column 1 reports the mean, kernel-weighted mean [in brackets] and standard deviation (in parentheses) of firm-level characteristics for firms that filled an IPO. The kernel-weighted mean is estimated to approximate a median and is calculated placing a 99% weight on observations within the interquartile range and a 1% weight on the remaining observations. Column 2 reports the values for the sample of firms which withdrew their IPO filing. Column 3 reports the mean for the sample of firms which completed their IPO filing. Column 4 reports the difference between Columns 2 and 3. Column 5 reports the p-value for the samples' difference in means t-test. All variables are described in Appendix Table 1. The sample includes high-tech firms which filed for an IPO between 1992 and 2003, inclusive. Statistical significance is calculated using robust standard errors. *, **, and *** denotes significance at the 10%, 5%, and 1% level, respectively.

	All Firms	IPO Withdrawn	IPO Successful	Difference	P-value of Difference
VC Backed	0.668	0.679	0.663	-0.016	0.596
	(0.471)	(0.468)	(0.473)		
Firm Employment	331.42	332.38	331.06	-1.322	0.965
	[145.69]	[138.96]	[149.32]		
	(618.11)	(652.42)	(605.30)		
Firm Payroll	19,815.57	20,458.01	19,573.65	-884.36	0.341
	[12,539.22]	[12,533.36]	[12,593.86]		
	(23,656.74)	(25,565.45)	(22,916.44)		
Average Wages (LBD)	89.79	94.00	88.21	-5.80**	0.037
	[84.40]	[89.41]	[82.40]		
	(42.05)	(41.23)	(42.28)		
Average Wages (LEHD)	107.649	110.941	106.409	-4.532*	0.081
	[104.320]	[108.400]	[103.066]		
	(45.848)	(46.372)	(45.630)		
Firm Age	8.08	7.58	8.26	0.68*	0.072
	[6.75]	[6.30]	[6.83]		
	(6.40)	(6.28)	(6.44)		
Return_60after	0.01	-0.04	0.03	0.070***	0.000
	[0.02]	[-0.03]	[0.03]		
	(0.12)	(0.14)	(0.10)		
Return_90before	0.08	0.07	0.08	0.01*	0.089
	[0.07]	[0.06]	[0.07]		
	(0.14)	(0.17)	(0.13)		
Return_resolution	0.03	-0.03	0.05	0.07***	0.009
	[0.03]	[-0.11]	[0.04]		
	(0.14)	(0.19)	(0.12)		

Table 1. Summary Statistics. Panel B. Column 1 reports the mean, kernel-weighted mean [in brackets] and standard deviation (in parentheses) of worker-level characteristics averaged at the firm-level for firms that filled an IPO. The kernel-weighted mean is estimated to approximate a median and is calculated placing a 99% weight on observations within the interquartile range and a 1% weight on the remaining observations. Column 2 reports the values for the sample of firms which withdrew their IPO filing. Column 3 reports the mean for the sample of firms which completed their IPO filing. Column 4 reports the difference between Columns 2 and 3. Column 5 reports the p-value for the samples' difference in means t-test. All variables are described in Appendix Table 1. The sample includes high-tech firms which filed for an IPO between 1992 and 2003, inclusive. Statistical significance is calculated using robust standard errors. *, **, and *** denotes significance at the 10%, 5%, and 1% level, respectively.

	All Firms	IPO Withdrawn	IPO Successful	Difference	P-value of Difference
Average Worker Age	37.378	37.835	37.205	-0.629**	0.028
	[37.165]	[37.434]	[36.986]		
	(4.564)	(4.650)	(4.523)		
Percent Female	0.308	0.316	0.305	-0.012	0.540
	[0.282]	[0.292]	[0.281]		
	(0.249)	(0.247)	(0.250)		
Percent White	0.844	0.849	0.841	-0.008	0.171
	[0.914]	[0.916]	[0.913]		
	(0.170)	(0.161)	(0.173)		
Percent Foreign-born	0.079	0.086	0.076	-0.010	0.192
	[0.056]	[0.063]	[0.055]		
	(0.141)	(0.148)	(0.139)		
Percent Born in State	0.314	0.301	0.319	0.018*	0.084
	[0.289]	[0.273]	[0.296]		
	(0.231)	(0.228)	(0.232)		
Average Education	14.716	14.604	14.759	0.155***	0.009
	[14.700]	[14.625]	[14.733]		
	(0.995)	(0.970)	(1.002)		
Average Tenure	1.260	1.220	1.275	0.056	0.436
	[1.117]	[1.061]	[1.145]		
	(0.780)	(0.808)	(0.769)		

Table 1. Summary Statistics. Panel C. Column 1 reports the mean, kernel-weighted mean [in brackets] and standard deviation (in parentheses) of variables measuring employee entrepreneurship propensity and different types of worker turnover over three year period following an IPO filing. The turnover variables are estimated at the firm–level. The kernel-weighted mean is estimated to approximate a median and is calculated placing a 99% weight on observations within the interquartile range and a 1% weight on the remaining observations. Column 2 reports the values for the sample of firms which withdrew their IPO filing. Column 3 reports the mean for the sample of firms which completed their IPO filing. Column 4 reports the difference between Columns 2 and 3. Column 5 reports the p-value for the samples' difference in means t-test. All variables are described in Appendix Table 1. The sample includes high-tech firms which filed for an IPO between 1992 and 2003, inclusive. Statistical significance is calculated using robust standard errors. *, **, and *** denotes significance at the 10%, 5%, and 1% level, respectively.

	All Firms	IPO Withdrawn	IPO Successful	Difference	P-value of Difference
Percent_entrepreneurship_all	0.047	0.051	0.045	-0.006	0.624
	[0.030]	[0.037]	[0.029]		
	(0.110)	(0.118)	(0.106)		
Percent_entrepreneurship_turnover	0.076	0.074	0.077	0.003	0.793
	[0.064]	[0.066]	[0.064]		
	(0.141)	(0.133)	(0.144)		
Percent_entrepreneurship_turnover_alt	0.063	0.060	0.064	0.004	0.776
	[0.051]	[0.053]	[0.052]		
	(0.127)	(0.121)	(0.129)		
Percent_stay	0.267	0.179	0.301	0.121***	0.000
	[0.282]	[0.200]	[0.313]		
	(0.251)	(0.222)	(0.253)		
Percent_move_older_firms	0.236	0.292	0.215	-0.077***	0.000
	[0.207]	[0.264]	[0.184]		
	(0.222)	(0.250)	(0.207)		
Percent_move_unknown_firm_age	0.154	0.163	0.150	-0.012	0.259
	[0.107]	[0.129]	[0.101]		
	(0.170)	(0.164)	(0.173)		
Percent_move_unemployed	0.292	0.311	0.285	-0.026	0.120
	[0.247]	[0.267]	[0.241]		
	(0.232)	(0.247)	(0.226)		

Table 1. Summary Statistics. Panel D. Column 1 reports the mean, kernel-weighted mean [in brackets] and standard deviation (in parentheses) of variables measuring worker ex ante wages (one quarter prior to the IPO filing) and ex post wages/wage growth (average over three years after an IPO filing), as well as firm employment growth post IPO filing (average over three years). All variables are estimated at the firm–level. The kernel-weighted mean is estimated to approximate a median and is calculated placing a 99% weight on observations within the interquartile range and a 1% weight on the remaining observations. Column 2 reports the values for the sample of firms which withdrew their IPO filing. Column 3 reports the mean for the sample of firms which completed their IPO filing. Column 4 reports the difference between Columns 2 and 3. Column 5 reports the p-value for the samples' difference in means t-test. All variables are described in Appendix Table 1. The sample includes high-tech firms which filed for an IPO between 1992 and 2003, inclusive. Statistical significance is calculated using robust standard errors. *, **, and *** denotes significance at the 10%, 5%, and 1% level, respectively.

	All firms	IPO Withdrawn	IPO Successful	Difference	P-value of Difference
Average Wages (LEHD)	107.649	110.941	106.409	-4.532*	0.081
	[104.320]	[108.400]	[103.066]		
	(45.848)	(46.372)	(45.630)		
Average Wages of Departing Employees (LEHD)	100.935	106.023	99.019	-7.004**	0.037
	[97.639]	[102.965]	[95.939]		
	(46.272)	(47.030)	(45.880)		
Average Future Wages	116.771	107.378	120.308	12.930***	0.000
	[110.014]	[102.058]	[113.526]		
	(56.231)	(52.247)	(57.307)		
Average Future Wages of Departing Employees	99.277	96.307	100.395	4.088	0.123
	[92.124]	[91.583]	[92.706]		
	(52.714)	(49.632)	(53.829)		
Average Wage Growth	0.049	-0.034	0.080	0.114***	0.000
	[0.056]	[-0.024]	[0.087]		
	(0.366)	(0.368)	(0.360)		
Average Wage Growth of Departing Employees	-0.125	-0.158	-0.113	0.045*	0.083
	[-0.092]	[-0.147]	[-0.072]		
	(0.495)	(0.478)	(0.501)		
Employment Growth	-0.02	-0.18	0.04	0.22***	0.000
	[0.01]	[-0.13]	[0.05]		
	(0.36)	(0.36)	(0.34)		

Table 2. OLS Regressions. This table reports results of OLS regressions of the percent of future entrepreneurs on whether or not the firm completed an IPO. The dependent variable is the count of employees who leave the IPO filing firm and join a start-up in the 3 years following the IPO filing. In Columns 1-4, this variable is scaled by all employees at the IPO filing firm, as measured in the quarter prior to the IPO filing. In Columns 5-8, this variable is scaled by all employees who leave the firm during this 3 year window to join firms of known age or exit the employment sample All control variables are defined in Appendix 1. The sample includes all high-tech firms which filed for an IPO between 1992 and 2003. Robust standard errors are reported in parentheses. *, **, and *** denotes significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IPO	-0.003	-0.002	0.004	0.002	0.006	0.007	0.012	0.010
	(0.011)	(0.011)	(0.013)	(0.010)	(0.013)	(0.013)	(0.014)	(0.012)
Firm Employment				-0.015***				-0.013**
				(0.005)				(0.006)
Average Wage				-0.046***				-0.045**
				(0.018)				(0.019)
Average Worker Age				-0.001				-0.002
				(0.001)				(0.001)
Percent Female				-0.022				-0.004
				(0.026)				(0.034)
Average Education				0.008				0.010
				(0.006)				(0.007)
Acq_after_ipo_in3yrs				0.017				0.016
				(0.011)				(0.013)
Return_90before				0.005				0.013
				(0.039)				(0.046)
Year FE	Yes	Yes	-	Yes	Yes	Yes	-	Yes
Industry FE	No	Yes	-	Yes	No	Yes	-	Yes
Industry FE x Year FE	No	No	Yes	No	No	No	Yes	No
Observations	760	760	760	760	760	760	760	760
R-Squared	-0.001	-0.003	-0.025	0.020	-0.001	-0.001	-0.027	0.010

Table 3. IV Regressions First-Stage. This table reports results of IV regressions (first-stage). The dependent variable is whether or not the firm completed an IPO. The instrumental variable is the NASDAQ return in the 60 day window following the IPO filing. All control variables are defined in Appendix 1. The sample includes all high-tech firms which filed for an IPO between 1992 and 2003. Robust standard errors are reported in parentheses. *, **, and *** denotes significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
Return_60after	0.508***	0.518***	0.546***	0.502***
	(0.152)	(0.152)	(0.152)	(0.152)
Firm Employment				0.032**
				(0.015)
Average Wage				0.055
				(0.044)
Average Worker Age				-0.005
				(0.004)
Percent Female				-0.081
				(0.065)
Average Education				0.027*
				(0.015)
Acq_after_ipo_in3yrs				-0.136***
				(0.040)
Return_90before				0.140
				(0.129)
Year FE	Yes	Yes	-	Yes
Industry FE	No	Yes	-	Yes
Industry FE x Year FE	No	No	Yes	No
Observations	760	760	760	760
Adjusted R-Squared	0.149	0.147	0.178	0.170
F-test	11.169	11.628	12.833	10.938
p-value	0.001	0.001	0.000	0.001

Table 4. IV Regressions Second-Stage. This table reports results of IV regressions of the percent of future entrepreneurs on whether or not the firm completed an IPO. The dependent variable is the count of employees who leave the IPO filing firm and join a start-up in the 3 years following the IPO filing. In Columns 1-4, this variable is scaled by all employees at the IPO filing firm, as measured in the quarter prior to the IPO filing. In Columns 5-8, this variable is scaled by all employees who leave the firm during this 3 year window to join firms of known age or exit the employment sample. IPO completion is instrumented by NASDAQ returns in the 60 day window following the IPO filing. All control variables are defined in Appendix 1. The sample includes all high-tech firms which filed for an IPO between 1992 and 2003. Robust standard errors are reported in parentheses. *, **, and *** denotes significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IPO	0.155*	0.161*	0.168*	0.175*	0.215*	0.221*	0.228**	0.243**
	(0.090)	(0.090)	(0.086)	(0.093)	(0.114)	(0.114)	(0.106)	(0.120)
Firm Employment				-0.021***				-0.022**
				(0.007)				(0.009)
Average Wage				-0.056***				-0.058***
				(0.021)				(0.022)
Average Worker Age				-0.000				-0.000
				(0.001)				(0.002)
Percent Female				-0.006				0.019
				(0.026)				(0.036)
Average Education				0.004				0.003
				(0.006)				(0.007)
Acq_after_ipo_in3yrs				0.040**				0.048*
				(0.020)				(0.025)
Return_90before				-0.014				-0.013
				(0.049)				(0.059)
Year FE	Yes	Yes	-	Yes	Yes	Yes	-	Yes
Industry FE	No	Yes	-	Yes	No	Yes	-	Yes
Industry FE x Year FE	No	No	Yes	No	No	No	Yes	No
Observations	760	760	760	760	760	760	760	760

Table 5. IV Regressions Second-Stage -- Alternative Measures of Entrepreneurship. This table reports results of IV regressions of measures of entrepreneurship on whether or not the firm completed an IPO. In Column 1, the dependent variable is the number of new firms associated with workers employed at the IPO filing firm during the quarter prior to the IPO filing who joined those new firms three years after the IPO filing, normalized by ex-ante employment. In Column 2, the dependent variable is the fraction of workers at the IPO filing firm who join startup three years following the IPO filing and are one of the top five paid employees at the start-up, normalized by ex-ante employment. In Column 3, the dependent variable is the number of new firms associated with workers employed at the IPO filing firm during the quarter prior to the IPO filing who joined those new firms three years after the IPO filing, normalized by the number of employees who leave and join firms of known age or drop from the LEHD sample. In Column 4, the dependent variable is the fraction of workers at the IPO filing firm who join startup three years following the IPO filing and are one of the top five paid employees at the start-up, normalized by the number of employees who leave and join firms of known age or drop from the LEHD sample. All control variables are defined in Appendix 1. The sample includes all high-tech firms which filed for an IPO between 1992 and 2003 and which are matched to both LBD and LEHD. Robust standard errors are reported in parentheses. *, **, and *** denotes significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
IPO	0.171*	0.118*	0.235**	0.235**
	(0.089)	(0.068)	(0.114)	(0.114)
Firm Employment	-0.020***	-0.014**	-0.021**	-0.021**
	(0.007)	(0.006)	(0.009)	(0.009)
Average Wage	-0.052**	-0.039**	-0.054**	-0.054**
	(0.020)	(0.018)	(0.022)	(0.022)
Average Worker Age	0.000	0.002	0.000	0.000
	(0.001)	(0.001)	(0.002)	(0.002)
Percent Female	-0.008	-0.000	0.012	0.012
	(0.025)	(0.020)	(0.035)	(0.035)
Average Education	0.004	0.002	0.004	0.004
	(0.006)	(0.005)	(0.007)	(0.007)
Acq_after_ipo_in3yrs	0.035*	0.024	0.042*	0.042*
	(0.019)	(0.015)	(0.024)	(0.024)
Return_90before	-0.022	-0.015	-0.017	-0.017
	(0.047)	(0.029)	(0.056)	(0.056)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Observations	760	760	760	760

Table 6. Turnover Results. This table reports results of OLS regressions (Columns 1-3) and IV regressions (Columns 4-6) of measures of employee turnover on whether or not the firm completed an IPO. In Columns 1 and 4, the dependent variable is the number of workers at the IPO filing firm who remain at the firm as of 3 years following the IPO filing, normalized by ex-ante employment at the IPO filing firm. In Columns 2 and 5, the dependent variable is the number of workers at the IPO filing firm who move to an established firm in the three years following the IPO filing, normalized by ex-ante employment at the IPO filing firm. An established firm is a firm with age more than three years. In Columns 3 and 6, the dependent variable is the number of workers at the IPO filing firm who drop out of the employment sample three years following the IPO filing, normalized by ex-ante employment at the IPO filing firm. In Columns 4-6, IPO completion is instrumented by the returns on NASDAQ in the 60 day window following the IPO filing. All control variables are defined in Appendix 1. The sample includes all high-tech firms which filed for an IPO between 1992 and 2003. Robust standard errors are reported in parentheses. *, **, and *** denotes significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
IPO	0.106***	-0.076***	-0.009	0.135	0.065	-0.248
	(0.020)	(0.020)	(0.014)	(0.139)	(0.176)	(0.164)
Firm Employment	0.029***	-0.008	0.015***	0.028***	-0.013	-0.010
	(0.008)	(0.007)	(0.005)	(0.010)	(0.009)	(0.010)
Average Wage	0.082***	-0.051**	0.016	0.080***	-0.059**	0.018
	(0.024)	(0.024)	(0.017)	(0.025)	(0.024)	(0.027)
Average Worker Age	-0.004*	0.002	0.001	-0.003	0.002	0.000
	(0.002)	(0.003)	(0.001)	(0.002)	(0.003)	(0.003)
Percent Female	0.052	0.061	-0.027	0.055	0.075	-0.084
	(0.042)	(0.051)	(0.030)	(0.043)	(0.054)	(0.057)
Average Education	-0.004	-0.012	0.007	-0.005	-0.016	0.007
	(0.009)	(0.012)	(0.007)	(0.010)	(0.014)	(0.013)
Acq_after_ipo_in3yrs	-0.128***	0.038*	0.063***	-0.123***	0.057*	-0.020
	(0.019)	(0.020)	(0.017)	(0.026)	(0.030)	(0.031)
Return_90before	-0.032	-0.007	0.020	-0.035	-0.023	0.041
	(0.059)	(0.057)	(0.045)	(0.059)	(0.061)	(0.074)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	760	760	760	760	760	760
Adjusted R-squared	0.181	0.051	0.060			

Table 7. Employment Results. This table reports results of OLS regressions (Columns 1-3) and IV regressions (Columns 4-6) of measures of firm employment on whether or not the firm completed an IPO. The dependent variable in Columns 1 and 4 is ex ante firm employment. The dependent variable in Columns 2 and 5 is ex post firm 1 year employment growth. The dependent variable in Columns 3 and 6 is ex post firm average three year employment growth. In Columns 4-6, IPO completion is instrumented by the returns on NASDAQ in the 60 day window following the IPO filing. All control variables are defined in Appendix 1. The sample includes all high-tech firms which filed for an IPO between 1992 and 2003. *, **, and *** denotes significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
IPO	0.208**	0.173***	0.166***	0.728	0.254	0.367*
	(0.089)	(0.040)	(0.027)	(0.620)	(0.337)	(0.202)
Firm Employment		-0.064***	-0.036***		-0.067***	-0.043***
		(0.022)	(0.012)		(0.024)	(0.014)
Average Wage	-1.441***	0.343***	0.125***	-1.445***	0.338***	0.113***
	(0.110)	(0.055)	(0.036)	(0.109)	(0.058)	(0.037)
Average Worker Age	-0.004	-0.013***	-0.007**	-0.001	-0.012**	-0.006*
	(0.010)	(0.005)	(0.003)	(0.011)	(0.005)	(0.003)
Percent Female	0.318*	0.088	-0.032	0.363*	0.096	-0.013
	(0.184)	(0.073)	(0.045)	(0.191)	(0.079)	(0.051)
Average Education	0.115***	-0.020	-0.005	0.099**	-0.023	-0.011
	(0.039)	(0.018)	(0.011)	(0.043)	(0.019)	(0.012)
Acq_after_ipo_in3yrs	0.104	0.038	-0.011	0.174	0.049	0.017
	(0.092)	(0.046)	(0.030)	(0.123)	(0.068)	(0.041)
Return_90before	0.251	-0.146	-0.138	0.188	-0.155	-0.160*
	(0.249)	(0.133)	(0.085)	(0.268)	(0.133)	(0.089)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	760	760	760	760	760	760
Adjusted R-squared	0.305	0.246	0.180			

Table 8. Wage Results. This table reports results of OLS regressions (Columns 1-4) and IV regressions (Columns 5-8) of measures of wages on whether or not the firm completed an IPO. The dependent variable in Columns 1 and 5 is the natural logarithm of ex ante average firm wages, aggregated based on individual wages for all employees covered in the LEHD. The dependent variable in Columns 2 and 6 measures ex post firm 3 year average wage growth using LEHD data. The dependent variable in Columns 3 and 7 measures ex post firm 3 year average wage growth using LEHD data for those workers who leave within 3 years following IPO filing. The dependent variable in Columns 4 and 8 measures ex post firm 3 year average wage growth using LBD data for all employees, pre-IPO filing workers and workers hired after the IPO filing. In Columns 4-6, IPO completion is instrumented by the returns on NASDAQ in the 60 day window following the IPO filing. All control variables are defined in Appendix 1. The sample includes all high-tech firms which filed for an IPO between 1992 and 2003. Robust standard errors are reported in parentheses. *, **, and *** denotes significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IPO	0.031	0.083**	0.005	0.067***	0.044	-0.071	-0.011	-0.066
	(0.040)	(0.032)	(0.042)	(0.021)	(0.305)	(0.256)	(0.327)	(0.165)
Firm Employment	-0.091***	0.011	0.003	0.007	-0.091***	0.016	0.004	0.012
	(0.016)	(0.012)	(0.018)	(0.008)	(0.017)	(0.015)	(0.020)	(0.010)
Average wage		0.004	-0.077	-0.112***		0.012	-0.076	-0.104***
		(0.041)	(0.056)	(0.027)		(0.043)	(0.057)	(0.030)
Average Worker Age	0.029***	-0.008**	-0.008	0.001	0.029***	-0.009**	-0.008	-0.000
	(0.005)	(0.004)	(0.005)	(0.002)	(0.005)	(0.004)	(0.005)	(0.002)
Percent Female	-0.684***	0.087	0.086	-0.012	-0.682***	0.072	0.084	-0.025
	(0.094)	(0.075)	(0.098)	(0.035)	(0.098)	(0.077)	(0.101)	(0.038)
Average Education	0.145***	-0.001	0.004	0.013	0.144***	0.003	0.004	0.016*
	(0.021)	(0.017)	(0.022)	(0.008)	(0.023)	(0.019)	(0.024)	(0.009)
Acq_after_ipo_in3yrs	0.013	0.030	0.077*	-0.080***	0.015	0.008	0.075	-0.098***
	(0.040)	(0.032)	(0.042)	(0.024)	(0.057)	(0.048)	(0.062)	(0.033)
Return_90before	0.161	-0.001	0.027	0.018	0.160	0.016	0.029	0.033
	(0.128)	(0.105)	(0.143)	(0.065)	(0.133)	(0.111)	(0.148)	(0.067)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	760	760	760	760	760	760	760	760
Adjusted R-squared	0.398	0.046	0.039	0.193				

Table 9. Wealth Shock Mechanism Results. This table reports first- and second-stage results of IV regressions of the percent of future entrepreneurs on whether or not the firm completed an IPO. Columns 1-3 is limited to firms which had two year industry stock returns over the years preceding the IPO filing in the top 1/2 of the industry return sample distribution. Columns 4-6 is limited to firms which had two year industry stock returns over the years preceding the IPO filing in the bottom 1/2 of the sample distribution. Columns 1 and 4 report first-stage results. Columns 2, 3, 5, and 6 report second-stage results. IPO completion is instrumented by the returns on NASDAQ in the 60 day window following the IPO filing. In Columns 1 and 3, the dependent variable is an indicator variable equal to one if the firm completed an IPO. In Columns 2 and 5, the dependent variable is the count of employees who leave the IPO filing firm and join a start-up three years following the IPO filing, scaled by all employees who leave the firm during this 3 year window to join firms of known age or exit the employment sample. In Columns 3 and 6, the dependent variable is the count of employees who leave the IPO filing firm and join a start-up three years following the IPO filing, scaled by all employees who leave the firm during this three year window to join firms of known age or exit the employment sample, using only employees in the top ½ of the firm's ex-ante wage distribution. All variables are defined in Appendix 1. The sample starts with all high-tech firms which filed for an IPO between 1992 and 2003. Robust standard errors are reported in parentheses. *, **, and *** denotes significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Return_60after	0.699***			0.459**		
	(0.204)			(0.218)		
IPO		0.218**	0.310**		0.156	0.133
		(0.110)	(0.145)		(0.141)	(0.169)
Firm Employment	0.005	-0.010	-0.007	0.047**	-0.023**	-0.014
	(0.022)	(0.010)	(0.012)	(0.019)	(0.012)	(0.011)
Average Wage	0.012	-0.040	-0.054	0.100	-0.070***	-0.067***
	(0.058)	(0.032)	(0.036)	(0.064)	(0.023)	(0.026)
Average Worker Age	0.003	-0.002	-0.002	-0.011**	-0.001	-0.003
	(0.005)	(0.002)	(0.003)	(0.005)	(0.003)	(0.003)
Percent Female	-0.113	0.076	0.061	-0.007	-0.042	-0.055
	(0.110)	(0.069)	(0.075)	(0.084)	(0.039)	(0.038)
Average Education	0.024	0.015	0.020	0.030	-0.005	-0.007
	(0.020)	(0.011)	(0.013)	(0.021)	(0.008)	(0.010)
Acq_after_ipo_in3yrs	-0.152**	0.034	0.041	-0.117**	0.042	0.030
	(0.062)	(0.030)	(0.038)	(0.053)	(0.028)	(0.032)
Return_90before	0.403**	-0.070	-0.031	-0.043	0.032	0.039
	(0.175)	(0.088)	(0.099)	(0.182)	(0.067)	(0.081)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	350	350	350	410	410	410
Adjusted R-squared	0.266			0.119		
F-test	11.735			4.412		
p-value	0.001			0.036		

Table 10. Culture Shock Mechanism Results. This table reports results of IV regressions of the percent of future entrepreneurs (estimated using only a subset of the firm's employees) on whether or not the firm completed an IPO. The dependent variable is the count of employees in the given subset who leave the IPO filing firm and join a start-up in three years following the IPO filing, scaled by all employees who leave the firm during this three year window to join firms of known age or exit the employment sample, using the given subset of employees. Column 1 is estimated using employee in the top 1/2 of the firm's age distribution, as of the quarter prior to the IPO filing. Column 2 is estimated using employees in the bottom 1/2 of the firm's age distribution, as of the quarter prior to the IPO filing. Column 3 is estimated using only male employees. Column 4 is estimated using only female employees. All control variables are defined in Appendix 1. The sample of firms includes all high-tech firms which filed for an IPO between 1992 and. Robust standard errors are reported in parentheses. *, **, and *** denotes significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
IPO	0.184*	0.157	0.213**	0.001
	(0.107)	(0.101)	(0.104)	(0.050)
Firm Employment	-0.015*	-0.025***	-0.020***	-0.000
	(0.008)	(0.008)	(0.008)	(0.004)
Average Wage	-0.037	-0.073***	-0.061***	-0.017
	(0.023)	(0.022)	(0.021)	(0.013)
Average Worker Age	-0.001	-0.000	-0.001	-0.000
	(0.001)	(0.002)	(0.002)	(0.001)
Percent Female	-0.005	-0.009	-0.022	0.033*
	(0.031)	(0.025)	(0.025)	(0.019)
Average Education	0.000	0.006	-0.000	0.003
	(0.006)	(0.006)	(0.006)	(0.004)
Acq_after_ipo_in3yrs	0.029	0.048**	0.044**	0.020
	(0.021)	(0.021)	(0.022)	(0.014)
Return_90before	-0.035	0.007	-0.011	0.011
	(0.063)	(0.046)	(0.052)	(0.027)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Observations	760	760	760	760

Table 11. IV Regressions -- Placebo Test Results. This table reports first- and second-stage results of IV regressions of the percent of future entrepreneurs on whether or not the firm completed an IPO and other controls. Column 1 reports first-stage results. Columns 2 and 3 report second-stage results. IPO completion is instrumented by the returns on NASDAQ in the 90 day window prior to the IPO filing. The dependent variable in Column 1 is whether or not the firm completed an IPO. The dependent variable in the remaining columns is the count of employees who leave the IPO filing firm and join a start-up in the 3 years following the IPO filing. In Column 2, this variable is scaled by all employees at the IPO filing firm, as measured in the quarter prior to the IPO filing. In Column 3, this variable is scaled by all employees who leave the firm during this 3 year window. All control variables are defined in Appendix 1. The sample includes all high-tech firms which filed for an IPO between 1992 and 2003. Robust standard errors are reported in parentheses. *, **, and *** denotes significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)
Return_90before	0.111		
	(0.130)		
IPO		0.048	0.126
		(0.355)	(0.436)
Firm Employment	0.035**	-0.016	-0.017
	(0.015)	(0.013)	(0.017)
Average Wage	0.058	-0.049*	-0.051
	(0.044)	(0.026)	(0.032)
Average Worker Age	-0.006	-0.001	-0.001
	(0.004)	(0.002)	(0.003)
Percent Female	-0.097	-0.018	0.007
	(0.065)	(0.041)	(0.056)
Average Education	0.027*	0.007	0.007
	(0.015)	(0.011)	(0.013)
Acq_after_ipo_in3yrs	-0.138***	0.023	0.032
	(0.041)	(0.051)	(0.063)
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Observations	760	760	760
Adjusted R-squared	0.157		
F-test	0.733		
p-value	0.392		