INTERNET APPENDIX for

IPOs, Human Capital, and Labor Reallocation

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IA-I. Additional Placebo Tests

To further investigate the validity of our instrumental variable (IV), we conduct a series of placebo tests in which we test whether 40-trading-day Nasdaq returns in the 10 months before and 10 months after a firms' IPO filings, but not directly following the filings, can predict the outcome variables we found to be significantly affected by IPO completion in our IV estimations. A potential vulnerability of the IV estimation strategy is that post-filing market returns might directly predict firms' post-IPO outcomes, for instance through changes in investment opportunities. If our main outcome variables of interest can be shown to have an insignificant correlation with stock market returns in other similar pre- and post-IPO filing periods, but windows that don't overlap with the book building period, we can further discredit this potential vulnerability.

Specifically, we estimate OLS regressions of the following form using 40-trading-day Nasdaq returns during the 10 months both before and after firms' IPO filings:

(1) $$Y_i = \beta_j \text{40-trading-day Nasdaq Return}_{i,j} + X_i'\delta_i + \mu_t + \vartheta_k + \varepsilon_i$$

The subscript i indexes firms and j indexes 17 unique specifications where we vary the 40-trading days over which we estimate NASDAQ returns. *40-trading day NASDAQ Return*$_i$ is the cumulative Nasdaq returns during a 40 trading day window (j) in the 10 months both before and after a firm's IPO filing; Y_i measures the outcome variable of interest; X_i' is a vector of control variables. μ_t are year fixed effects, ϑ_k are industry fixed effects and ε_i is the error term. Using the 10 months before and the 10 months following the IPO event, we measure 40-trading-day Nasdaq returns in overlapping windows starting at the tenth month (200 trading days) prior to the IPO, followed by the ninth month (180 trading days) prior to the IPO, and continuing on through the third month (60 trading days) pre-IPO. We include a specification that measures 40-trading-day Nasdaq returns starting on the date of the IPO filing. We also include specifications starting with the third month (60 trading days) post-IPO, fourth month (80 trading days) post-IPO, with the last

specification starting at the tenth month (200 trading days) post-IPO. Observations are measured at the firm level and standard errors clustered by 2-digit SIC code (for LBD sample regressions) and by year-quarter and 2-digit SIC code (for LEHD sample regressions) are reported.

Figure IA1 plots the estimated coefficients β_j for each of the return windows in black along with the 95 percent confidence intervals in shaded gray. Graph (a) reports regression coefficients when employment growth is the dependent variable. Graph (b) reports regression coefficients when the dependent variable is the change in industrial concentration. Graph (c) reports regression coefficients when the dependent variable is the new hire wage premium. Graph (d) reports regression coefficients when the dependent variable is the departure rate to entrepreneurship. The coefficient at the zero point on the x-axis corresponds to the coefficient from an OLS regression on the 40-trading-day Nasdaq return following a firm's IPO filing, our main instrumental variable. All other points correspond to placebo tests. For example, the coefficients at the -3, -4, and -10 points on the x-axis correspond to the coefficients on the 40-trading-day Nasdaq returns beginning 60 trading days (3 months), 80 trading days (4 months), and 200 trading days (10 months), respectively, before a firm's IPO filing. Likewise, the coefficients at the 3, 4, and 10 points on the x-axis correspond to the coefficients on the 40-trading-day Nasdaq returns beginning 60 trading days (3 months), 80 trading days (4 months), and 200 trading days (10 months), respectively, following a firm's IPO filing.

Consistent with the baseline IV results, employment growth, the change in industrial concentration, the new hire wage premium, and employee departures to entrepreneurship are significantly correlated with NASDAQ returns measured over the 40-trading days following the IPO filing at the 5% level. Given that each panel in Figure IA1 details results from 16 unique regressions, 64 regressions in total, it is not surprising that we do find a statistically significant correlation with returns measured outside of the book building window in three instances, and only one instance in which the sign of the correlation with the outcome variable is the same as during the 40 trading days following the IPO. However, the overall pattern, across outcome variables, is one where 40-

trading-day returns outside of the book building period do not significantly impact our outcome variables of interest, supporting the validity of our chosen instrument.

**Coefficients on NASDAQ Returns for Placebo Periods Surrounding IPO Filing**

This figure plots the coefficients (black line) and 95% confidence intervals (gray shaded region) on 40-trading-day Nasdaq returns in the 10 months before and after an IPO filing on firm characteristics after an IPO filing. Graph (a) reports regression coefficients in which the dependent variable is annualized firm-level employment growth in the three years following an IPO filing (LBD sample). Graph (b) reports regressions coefficients in which the dependent variable is annualized change in industrial concentration in the three years following IPO filing (LBD sample). Graph (c) reports regressions coefficients in which the dependent variable is the new hire wage premium (LEHD sample). Panel D reports regressions coefficients in which the dependent variable is the departure rate to entrepreneurship by employees in the three years following IPO filing (LEHD sample). All four dependent variables are defined in detail in Section III of the main paper. All regressions include control variables: log of firm employment and average firm wages in the year of the IPO filing, firm age, Nasdaq return in the 60-trading-day window prior to the IPO filing, and an indicator for whether a firm is VC-backed, syndicate size, underwriter reputation, and log filing amount. The coefficient at the zero point on the x-axis corresponds to coefficient on the 40-trading-day Nasdaq return following a firm's IPO filing. Standard errors used to compute the confidence intervals are clustered by 2-digit SIC code in Graphs (a) and (b) and by year-quarter and 2-digit SIC code in Graphs (c) and (d).
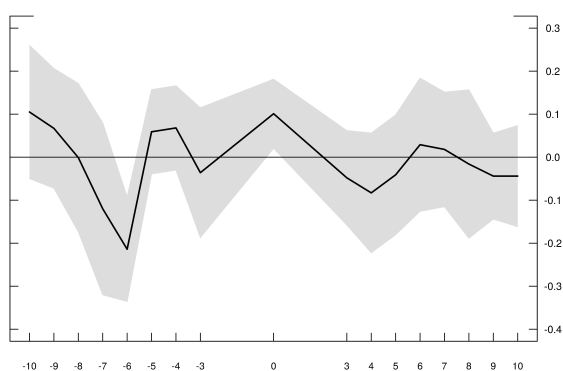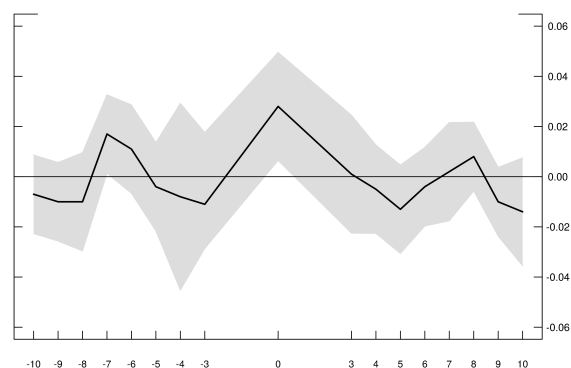

(a) Employment Growth
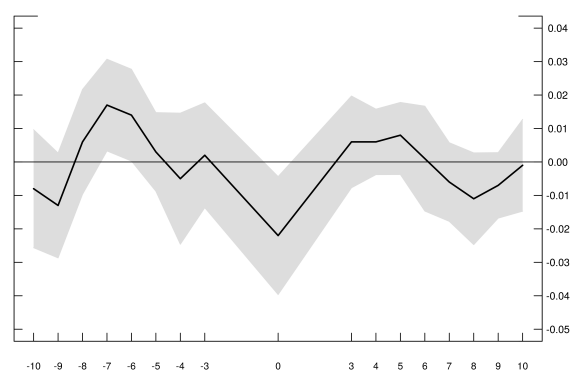
(b) Change in Industrial Concentration
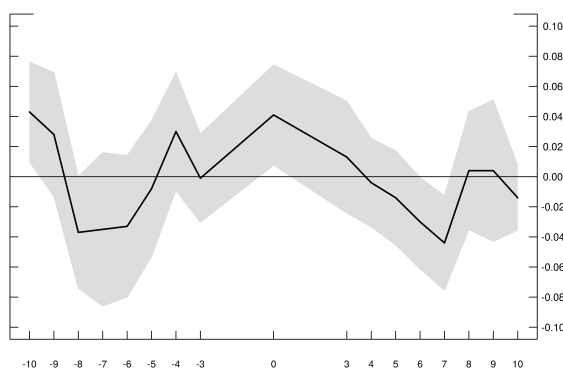
(c) New Hire Wage Premium

(d) Departure to Entrepreneurship

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IA-II.   Additional Robustness Tests

Tables IA1 to IA3.   We report the OLS regression estimates for the employment, scale, diversification, wages, and entrepreneurship outcome variables considered in Tables 5, 6, and 7 in the main paper. Table IA1 reports OLS regression estimates for the relationship between a successful IPO and firms' growth in employment, scale, diversification, and wages. Table IA2 reports OLS regression estimates for the relationship between a successful IPO and growth in wages for different types of employees. Table IA3 reports OLS regression estimates for the relationship between a successful IPO and departure rates to entrepreneurship for different types of employees.

Table IA4.   Table IA4 presents an alternative specification for the paper's IV regressions for each of the four main outcome variables but without control variables.

Table IA5.   We explore an alternative specification for the paper's OLS and IV regressions for each of our four main outcome variables, but use a difference-in-difference estimation approach in which we examine the change in our main outcome variables in the three years prior to the IPO filing relative to the three years following the IPO filing. We estimate equations of the following form:

$$(2) \qquad Y_{it} = \beta_2 \widehat{IPO}_i + \beta_3 After_t + \beta_4 \widehat{IPO}_i * After_t + \vartheta_i + \varepsilon_{it}$$

The variable $After$ is a dummy equal to one in the period following an IPO, an ϑ_i are firm fixed effects. Requiring three years of non-missing data for all dependent and independent variables in our main regressions significantly reduces our sample size. Nonetheless, we estimate IV regressions in which we use the 40-trading day NASDAQ return following IPO filing and its interaction with the $After$ dummy to instrument for the IPO dummy and its interaction with the $After$ dummy. Note that using the IV is still important even in the difference-in-difference framework, since such a setup does not eliminate the possible endogeneity of certain types of firms being more likely to compete their IPOs. The results reported in Table IA5 are broadly consistent with those in the larger estimation sample.

Table IA6.   We report summary statistics for firms in the 31 LEHD states in Table IA6. We also report the same statistics for the full set of firms, thereby allowing for easy comparison. The full sample is in column 1 and the LEHD sample is in column 2. For both samples, we aggregate establishment-level data to create firm-level averages. For the full sample, we report the results for all firms. For the LEHD sample, we report results using only those firms with at least some employment in our 31 LEHD states. For completeness, we replicate all summary statistics from

Tables 1 and 2 of the main paper that can be generated for the full set of states. Panel A reports pre-IPO summary statistics for the full and the LEHD samples. Not surprisingly, firms that are observed, at least partially, in the 31 LEHD states tend to be larger in terms of total employment, number of establishments, or physical presence across states. These firms are also more likely to have their headquarters in one of the 31 LEHD states. However, these firms are otherwise economically similar. For example, 51% of firms in the LEHD sample are VC-backed, compared to 49% in the full sample. Moreover, 49% of firms in the LEHD sample are high-tech, compared to 50% in the full sample. Panel B reports post-IPO changes for the full and LEHD samples. Firms in the full sample, which start with lower ex ante employment, grow employment modestly faster, compared to firms in the LEHD sample. However, both sets of firms realize identical growth in average wages and industrial concentration to the third significant digit. Likewise, firms in both groups experience similar growth in the number of establishments and states with a physical presence.

Table IA7. To provide further evidence of no systematic bias in the LEHD sample, we repeat the regressions presented in Table 5 of the main paper using first the full sample and then the LEHD-State sample, or the set of firms with employment in our 31 LEHD states. The results are reported in Table IA7. The unit of observation is a firm-level aggregate using all domestic establishments. Panel A presents results for the full sample (a replication of the results in Table 5 in the main paper, presented again here for ease of comparison.) Panel B presents results using only those firms with at least some employment in our 31 LEHD states. In both panels, we instrument the IPO-completion indicator and the interaction of the IPO and high-tech firm indicators with 1) the Nasdaq return in the 40 trading day window following the initial IPO filing, and 2) the interaction of high-tech indicator with the Nasdaq return. We also include the full set of controls, as well as year and industry fixed effects.

Overall, the coefficients are similar when we use the full sample (Panel A) or when we use only those firms with at least some employment in our 31 LEHD states (Panel B). With the full sample, we find a positive and statistically significant relationship between employment growth and IPO completion. With the LEHD-State sample, we also document a positive and statistically significant relationship between employment growth and IPO completion. Moreover, the two coefficient estimates are similar in economic magnitude. Likewise, we report negative and statistically significant coefficients of similar magnitude when measuring the causal impact of IPO completion on changes in industrial concentration using either the full or LEHD-State sample. We find no significant relation between IPO completion and the growth in the number of establishments, number of states, or average wages in either sample. In sum, these results provide further support for our argument that there is no systematic bias in our 31 LEHD states.

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Table IA8. We present summary statistics for firms in the LEHD sample with headquarters in LEHD states and for firms in the LEHD sample whose headquarters are in non-LEHD states in Table IA8. Eighty-eight percent of employees and payroll are located in LEHD states for firms whose headquarters are also in LEHD states. By contrast, around 15% of employees and payroll are located in LEHD states for firms whose headquarters are not located in an LEHD state. Over half of our sample of LEHD firms have headquarters located in LEHD states. The wages of employees in the firms with headquarters in LEHD states are higher on average than for firms with headquarters not in LEHD states, likely reflecting the fact that the highest paid executives are in the sample for the firms whose headquarters are included in the sample. We also show that the departures of workers to entrepreneurship is similar across samples, and departure of workers from the LEHD sample is generally similar across samples.[1]

Tables IA9 and IA10. We present estimates of our main IV regressions differentiating the effect of the IPO by firms whose headquarters are not based in LEHD states. Table IA9 shows estimates for the LBD sample outcome variables. Table IA10 shows estimates for the LEHD sample outcome variables. We find that, in all but one case, our results are not significantly different when we break out the effects by firms whose headquarters are not in LEHD states. The one exception we find is that a significantly greater decline in wages among pre-IPO employees who remain at the firm post-IPO at firms with headquarters are outside of LEHD states. This suggests that employees outside of the headquarters, who are less likely to be executives, are relatively more likely to experience wage declines following an IPO. Otherwise, we find similar results regardless of whether the firm's headquarters are or are not included in our sample.

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[1]In Internet Appendix Section IA-III, we benchmark the departure rates from the LEHD sample (private sector employment) to departure rates from private sector employment in Current Population Survey (CPS).

TABLE IA1

OLS: Relation Between Successful IPOs and Firm Outcomes

Table IA1 reports results of OLS regressions and shows how a successful IPO correlates with a firm's growth in employment, scale, diversification, and wages. The sample includes U.S. firms that filed for an IPO from 1992 through the first quarter of 2006. The unit of observation is a firm-level aggregation of establishment-level LBD data for 50 U.S. states and the District of Columbia. The independent variable, IPO, equals 1 if a firm completed its IPO, and 0 otherwise. All dependent variables are measured over three years, starting the year of the IPO. These variables are then transformed into an annualized number. In column 1, the dependent variable is the annualized growth in employment. In column 2, the dependent variable is the annualized growth in the number of establishments. In column 3, the dependent variable is the annualized growth in the number of states where a given firm has a physical presence. In column 4, the dependent variable is the annualized growth in industrial concentration. In column 5, the dependent variable is the annualized growth in average firm wages. The control variables include the log of firm employment and average firm wages in the year of the IPO filing, firm age, Nasdaq return in the 60-trading-day window prior to the IPO filing, and an indicator for whether a firm is VC-backed, syndicate size, underwriter reputation, and log filing amount. The parameter estimates for the control variables are not reported due to U.S. Census restrictions on the number of exported estimates. Per Census Bureau disclosure rules, observations and estimates are rounded. Standard errors clustered at the 2-digit SIC code are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable				
	Annualized Growth in Employment$_{t,t+3}$	Annualized Growth in # of Establishments$_{t,t+3}$	Annualized Growth in # of States$_{t,t+3}$	Annualized Growth in Industrial Concentration$_{t,t+3}$	Annualized Growth in Average Firm Wages$_{t,t+3}$
	1	2	3	4	5
IPO	0.143***	0.021	0.013	-0.004**	0.055***
	(0.018)	(0.014)	(0.009)	(0.002)	(0.009)
Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Number of Observations	3,400	3,400	3,400	3,400	3,400
Adjusted R^2	0.157	0.058	0.056	0.017	0.173

TABLE IA2

OLS: Relation Between Successful IPOs and Wage Growth

Table IA2 reports results of OLS regressions and shows how a successful IPO correlates with growth in wages for different types of employees. The sample includes U.S. firms that filed for an IPO from 1992 through the first quarter of 2006. The unit of observation is a firm-level aggregation of workers available in our 31 LEHD states. The independent variable, IPO, equals 1 if a firm completed its IPO, and 0 otherwise. In columns 1–3, the dependent variable is the three-year growth in employee wages. In column 1, the wage growth calculation includes all workers observed at the firm one quarter before the IPO filing. In column 2, the wage growth calculation includes all workers observed at the firm one quarter before the IPO filing who remain at the firm three years later. In column 3, the wage growth calculation includes all workers observed at the firm one quarter before the IPO filing who are no longer at the firm three years later. In column 4, the dependent variable is the new hire wage premium, defined as the difference in log wages between the first full quarter wage at the IPO filing firm and the last full quarter of wages at the previous employer. The control variables include the log of firm employment and average firm wages in the year of the IPO filing, firm age, Nasdaq return in the 60-trading-day window prior to the IPO filing, and an indicator for whether a firm is VC-backed, syndicate size, underwriter reputation, and log filing amount. The parameter estimates for the control variables are not reported due to US Census restrictions on the number of exported estimates. Per Census Bureau disclosure rules, observations and estimates are rounded. Standard errors clustered at the year-quarter and 2-digit SIC code are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable			
	3-Year Growth in Employee Wages$_{t,t+3}$			New Hire Wage Premium
	Type of workers			
	Pre-IPO	Pre-IPO & Stay at $t+3$	Pre-IPO & Leave by $t+3$	Post-IPO Hires
	1	2	3	4
IPO	0.033	0.046	0.030	0.001
	(0.034)	(0.030)	(0.031)	(0.007)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Number of Observations	2,400	2,400	2,400	2,400
Adjusted R^2	0.017	0.016	0.017	0.038

TABLE IA3

OLS: Relation Between Successful IPOs and Entrepreneurial Departures

Table IA3 reports results of OLS regressions and shows how a successful IPO correlates with employee departures to entrepreneurship. The sample includes US firms that filed for an IPO from 1992 through the first quarter of 2006. The unit of observation is a firm-level aggregation of workers available in our 31 LEHD states. The independent variable, IPO, equals 1 if a firm completed its IPO, and 0 otherwise. The dependent variable is the fraction of entrepreneurial departures, defined as the fraction of workers one quarter before IPO filing who are observed three years later at a firm no more than three years old and who are among the top five earners at that firm. In columns 1 and 6, the dependent variable includes all workers at the firm one quarter before the IPO filing. In column 2 (3), the dependent variable includes workers at the firm one quarter before the IPO filing whose wage is above (equals or is below) the median worker wage. In column 4 (5), the dependent variable includes workers at the firm one quarter before the IPO filing whose age eis above (equals or is below) the median worker age. In column 6, the interaction of IPO and High-tech firm indicators is instrumented with the interaction of High-tech indicator with the Nasdaq return in the 60-day window following the initial IPO filing. High-tech is 1 for firms in computer, bio-tech or electronics sectors, and 0 otherwise. The control variables include the log of firm employment and average firm wages in the year of the IPO filing, firm age, Nasdaq return in the 60-trading-day window prior to the IPO filing, and an indicator for whether a firm is VC-backed, syndicate size, underwriter reputation, and log filing amount. The parameter estimates for the control variables are not reported due to U.S. Census restrictions on the number of exported estimates. Per Census Bureau disclosure rules, observations and estimates are rounded. Standard errors clustered at the year-quarter and 2-digit SIC code are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable: Departure Rate to Entrepreneurship$_{t,t+3}$					
	Type of workers					
Type of Workers:	All	High Wage	Low Wage	High Age	Low Age	All
	1	2	3	4	5	6
IPO	0.006**	0.008**	0.004	0.004	0.007*	0.003
	(0.003)	(0.004)	(0.003)	(0.004)	(0.004)	(0.002)
IPO X High-tech						0.005
						(0.004)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	2,400	2,400	2,400	2,400	2,400	2,400
Adjusted R^2	0.013	0.010	0.005	0.008	0.011	0.014

TABLE IA4

Second-stage IV Regressions: Estimates Without Controls Variables

Table IA4 reports second-stage results of instrumental (IV) regressions and shows that the estimates without controls are similar in terms of statistical and economic significance. The sample includes U.S. firms that filed for an IPO from 1992 through the first quarter of 2006. The unit of observation is a complete firm in columns 1 and 2, and a firm-level aggregation of workers available in our 31 LEHD states in columns 3 and 4. The independent variable, IPO, equals 1 if a firm completed its IPO, and 0 otherwise. IPO is instrumented with the Nasdaq return in the 40-trading-day window following the initial IPO filing. All dependent variables are measured over three years, starting the year of the IPO. In column 1, the dependent variable is the annualized growth in employment, measured over three years following the IPO filing. In column 2, the dependent variable is the annualized growth in industrial concentration, measured over three years following the IPO filing. In column 3, the dependent variable is the new hire wage premium, defined as the difference in log wages between the first full quarter wage at the IPO-filing firm and the last full quarter of wages at the previous employer. In column 4, the dependent variable is the fraction of entrepreneurial departures, defined as the fraction of workers one quarter before IPO filing who are observed three years later at a firm no more than three years old and who are among the top five earners at that firm. Per Census Bureau disclosure rules, observations and estimates are rounded. Standard errors clustered at the 2-digit SIC code are reported in parentheses in columns 1 and 2. Standard errors clustered at the year-quarter and 2-digit SIC code are reported in parentheses in columns 3 and 4. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable			
	Annualized Growth in Employment$_{t,t+3}$	Annualized Growth in Industrial Concentration$_{t,t+3}$	New Hire Wage Premium	Departure Rate to Entrepreneurship$_{t,t+3}$
	1	2	3	4
IPO	0.246**	-0.045**	0.097***	0.064***
	(0.097)	(0.020)	(0.032)	(0.019)
Controls	No	No	No	No
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Number of Observations	3,400	3,400	2,400	2,400
F-statistic	58.0	58.0	43.6	43.6

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TABLE IA5

Difference-in-Difference Regression Specifications

Table IA5 reports OLS and second stage instrumental variable (IV) estimates for difference-in-difference regressions for the sample of LBD firms (columns 1 and 2) and LEHD firms (columns 3 and 4) that can be observed and have non-missing data in the 3 years prior to IPO filing. The variable IPO equals 1 if a firm completed its IPO, and 0 otherwise. The variable After equals one in the period following a firm's IPO filing, and 0 otherwise. Each firm appears twice in the regressions, once in the before-filing period and once in the after-filing period. Panel A reports OLS regression estimates. Panel B reports second stage IV regression estimates. The interaction term IPO*After is instrumented using the interaction between the 40-trading-day Nasdaq return following a firm's IPO filing and the After dummy. IPO is instrumented using the 40-trading-day Nasdaq return following a firm's IPO filing. Per Census Bureau disclosure rules, observations and estimates are rounded. Standard errors clustered at the 2-digit SIC code are reported in parentheses in columns 1 and 2. Standard errors clustered at the year-quarter and 2-digit SIC code are reported in parentheses in columns 3 and 4. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable			
	Annualized Growth in Employment	Annualized Growth in Industrial Concentration	New Hire Wage Premium	Departure Rate to Entrepreneurship
	1	2	3	4
Panel A. OLS Regressions				
IPO*After	0.144***	-0.010***	0.006	0.022
	(0.026)	(0.003)	(0.006)	(0.056)
Firm FE	Yes	Yes	Yes	Yes
Number of Observations	4,000	4,000	3,000	3,000
Adjusted R^2	0.101	0.005	0.033	0.002
Panel B. IV Regressions - Second Stage				
IPO*After	0.338**	-0.005	0.663**	0.038
	(0.116)	(0.015)	(0.286)	(0.028)
Firm FE	Yes	Yes	Yes	Yes
Number of Observations	4,000	4,000	3,000	3,000
F-statistic	192.6	192.6	53.1	53.1

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TABLE IA6

Comparing Full Sample vs. LEHD Sample: Summary Statistics

Table IA6 shows that firm-level characteristics of IPO-filing firms are similar for two samples: 1) all firms matched to the LBD (column 1), and 2) the LBD-matched firms that also have employees in our 31 LEHD states (column 2). The sample includes US firms that filed for an IPO from 1992 through the first quarter of 2006. The table reports means for all variables and standard deviations, in parentheses, for continuous variables. The unit of observation is a complete firm (column "Full Sample"; 3,400 observations), and a firm-level aggregation of workers available in our 31 LEHD states (column "LEHD Sample"; 2,400 observations). Both panels contain variables that are available for both samples to allow the comparison. Statistics in column "Full Sample" in Panel A (Panel B) are identical to the results in column "Full Sample" of Table 1 Panel A (Table 2 Panel A) in the main paper but are repeated here for comparison. Panel A shows firm-level characteristics as of their IPO filing, and Panel B shows changes in firm-level characteristics following the firm's IPO filing. Variable definitions are available in Table 1 in the main paper for Panel A and in Table 2 in the main paper for Panel B. Per Census Bureau disclosure rules, observations and estimates are rounded.

	Full Sample	LEHD Sample
Panel A. Pre-IPO Characteristics		
Firm Age$_t$	8.84	9.76
	(7.05)	(7.32)
Employment$_t$	467	590
	(865)	(964)
Number of Establishments$_t$	9.00	11.58
	(19.91)	(22.52)
Number of States$_t$	3.10	3.83
	(4.60)	(5.19)
Industrial Concentration$_t$	0.925	0.906
	(0.165)	(0.182)
Nasdaq Return 40 Trading Days After	0.011	0.012
	(0.100)	(0.104)
Nasdaq Return 60 Trading Days Before	0.060	0.064
	(0.121)	(0.126)
Syndicate Size	2.59	2.78
	(1.58)	(1.70)
Underwriter Reputation	7.06	7.36
	(2.22)	(2.01)
Log Filing Amount ($ millions)	3.5	3.68
	(1.02)	(0.948)
VC-backed	0.489	0.506
High-tech	0.503	0.486
HQ State not in LEHD	0.527	0.445
Number of Observations	3,400	2,400
Panel B. Post-IPO Changes		
Annualized Growth in Employment$_{t,t+3}$	0.194	0.179
	(0.347)	(0.342)
Annualized Growth in Average Firm Wages$_{t,t+3}$	-0.036	-0.036
	(0.220)	(0.218)
Annualized Growth in # of Establishments$_{t,t+3}$	0.066	0.071
	(0.212)	(0.223)
Annualized Growth in # of States$_{t,t+3}$	0.046	0.050
	(0.147)	(0.152)
Annualized Growth in Industrial Concentration$_{t,t+3}$	-0.006	-0.006
	(0.041)	(0.044)
Number of Observations	3,400	2,400

TABLE IA7

Comparing Full Sample vs. LEHD Sample: Regression Analysis

Table IA7 reports second-stage results of IV regressions and shows that post IPO-filing growth in a firm's employment, scale, diversification, and wages are similar for two samples: 1) all firms matched to the LBD (Panel A), and 2) the LBD-matched firms that also have employees in our 31 LEHD states. Panel A is identical to the results in Table 4 in the main paper, but are repeated here for comparison. The sample includes U.S. firms that filed for an IPO from 1992 through the first quarter of 2006. The unit of observation is a complete firm (Panel A; 3,400 observations), and a firm-level aggregation of workers available in our 31 LEHD states (Panel B; 2,400 observations). All dependent variables are measured over three years, starting the year of the IPO. These variables are then transformed into an annualized number. In column 1, the dependent variable is the annualized growth in employment. In column 2, the dependent variable is the annualized growth in the number of establishments. In column 3, the dependent variable is the annualized growth in the number of states where a given firm has a physical presence. In column 4, the dependent variable is the annualized growth in industrial concentration. In column 5, the dependent variable is the annualized growth in average firm wages. The control variables include the log of firm employment and average firm wages in the year of the IPO filing, firm age, Nasdaq return in the 60-trading-day window prior to the IPO filing, and an indicator for whether a firm is VC-backed, syndicate size, underwriter reputation, and log filing amount. The parameter estimates for the control variables are not reported due to the U.S. Census restrictions on the number of exported estimates. Per Census Bureau disclosure rules, observations and estimates are rounded. Standard errors clustered at the 2-digit SIC code are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable				
	Annualized Growth in Employment$_{t,t+3}$	Annualized Growth in # of Establishments$_{t,t+3}$	Annualized Growth in # of States$_{t,t+3}$	Annualized Growth in Industrial Concentration$_{t,t+3}$	Annualized Growth in Average Firm Wages$_{t,t+3}$
	1	2	3	4	5
Panel A. LBD Sample					
	0.199**	0.095	0.036	-0.044**	0.023
	(0.081)	(0.084)	(0.059)	(0.020)	(0.074)
Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Number of Observations	3,400	3,400	3,400	3,400	3,400
F-statistic	63.5	63.5	63.5	63.5	63.5
Panel B. LEHD Sample					
IPO	0.245***	0.180*	0.083	-0.053**	-0.046
	(0.093)	(0.095)	(0.069)	(0.022)	(0.083)
Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Number of Observations	2,400	2,400	2,400	2,400	2,400
F-statistic	56.5	56.5	56.5	56.5	56.5

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TABLE IA8

Summary Statistics for Firms Headquartered in LEHD and Non-LEHD States

Table IA8 shows firm-level characteristics of IPO-filing firms for two samples: 1) firms in the LEHD sample whose headquarters are located in one of our 31 LEHD states (column 1), and 2) firms in the LEHD sample whose headquarters are not located in one of the 31 LEHD states (column 2). The sample includes US firms that filed for an IPO from 1992 through the first quarter of 2006. The table reports means for all variables and standard deviations, in parentheses, for continuous variables. The unit of observation is a firm-level aggregation of workers available in our 31 LEHD states. Wages are adjusted to be reported in 2014 real dollars. Per Census Bureau disclosure rules, observations and estimates are rounded.

	LEHD HQ Firms	Non-LEHD HQ Firms
Share of firm employment in LEHD states	0.881	0.157
	(0.230)	(0.279)
Share of firm payroll in LEHD states	0.885	0.148
	(0.225)	(0.268)
Average wage per employee (thousands)	78.8	69.2
	(108)	(47.3)
Departure rate from LEHD sample$_{t,t+3}$	0.209	0.248
	(0.041)	(0.038)
Departure rate to entrepreneurship$_{t,t+3}$	0.025	0.021
	(0.060)	(0.071)
Observations	1,300	1,100

TABLE IA9

Robustness Tests Using Headquarters Location: LBD Sample

Table IA9 reports second-stage results of instrumental variable (IV) regressions and shows that post IPO-filing growth in a firm's employment, scale, diversification, and wages, is similar for two types of firms: 1) all firms matched to the LBD, and 2) the LBD-matched firms that also have their headquarters located outside of our 31 LEHD states (indicator variable "HQ State Not in LEHD"). The sample includes U.S. firms that filed for an IPO from 1992 through the first quarter of 2006. The independent variable, IPO, equals 1 if a firm completed its IPO, and 0 otherwise. IPO is interacted with an indicator HQ State not in LEHD. The IPO indicator and the interaction of IPO and HQ State not in LEHD indicators are instrumented in the first stage with: 1) the Nasdaq return in the 40-trading-day window following the initial IPO filing, and 2) the interaction of HQ State not in LEHD indicator with the Nasdaq return. All dependent variables are measured over three years, starting the year of the IPO. These variables are then transformed into an annualized number. In column 1, the dependent variable is the annualized growth in employment. In column 2, the dependent variable is the annualized growth in the number of establishments. In column 3, the dependent variable is the annualized growth in the number of states where a given firm has a physical presence. In column 4, the dependent variable is the annualized growth in industrial concentration. In column 5, the dependent variable is the annualized growth in average firm wages. The control variables include the log of firm employment and average firm wages in the year of the IPO filing, firm age, Nasdaq return in the 60-trading-day window prior to the IPO filing, and an indicator for whether a firm is VC-backed, syndicate size, underwriter reputation, and log filing amount, as well as the dummy variable for whether the firm is not headquartered in an LEHD state. The parameter estimates for the control variables are not reported due to the U.S. Census restrictions on the number of exported estimates. Per Census Bureau disclosure rules, observations and estimates are rounded. Standard errors are reported in parentheses and are clustered by 2-digit SIC code. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable				
	Annualized Growth in Employment$_{t,t+3}$	Annualized Growth in # of Establishments$_{t,t+3}$	Annualized Growth in # of States$_{t,t+3}$	Annualized Growth in Industrial Concentration$_{t,t+3}$	Annualized Growth in Average Firm Wages$_{t,t+3}$
	1	2	3	4	5
IPO	0.283**	0.129	0.035	-0.046**	0.044
	(0.012)	(0.086)	(0.059)	(0.019)	(0.087)
IPO X HQ State Not in LEHD	-0.165	-0.061	0.008	0.003	-0.054
	(0.120)	(0.102)	(0.045)	(0.013)	(0.083)
Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Number of Observations	3,400	3,400	3,400	3,400	3,400
F-statistic	30.8	30.8	30.8	30.8	30.8

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Robustness Tests Using Headquarter's Location: LEHD Sample

Table IA10 reports second-stage results of instrumental (IV) regressions and shows that post IPO-filing growth in wages and departure to entrepreneurship is similar for two types of firms: 1) all firms in the LEHD sample, and 2) the LEHD firms that also have their headquarters located outside of our 31 LEHD states (indicator variable "HQ State Not in LEHD"). The unit of observation is a firm-level aggregation of workers available in our 31 LEHD states. The sample includes U.S. firms that filed for an IPO from 1992 through the first quarter of 2006. The IPO indicator and the interaction of IPO and HQ State not in LEHD indicators are instrumented in the first stage with: 1) the Nasdaq return in the 40-trading-day window following the initial IPO filing, and 2) the interaction of HQ State not in LEHD indicator with the Nasdaq return. The interaction between the IPO indicator and wthe High-tech indicator is instrumented by the interaction between the Nasdaq return in the 40-trading-day window following the initial IPO filing and the High-tech dummy. The interaction between the IPO indicator and the HQ state not in LEHD indicator and the High-tech indicator is instrumented with the Nasdaq return in the 40-trading-day window following the IPO filing interacted with the HQ state not in LEHD indicator and High-tech indicator. The control variables include the log of firm employment and average firm wages in the year of the IPO filing, firm age, Nasdaq return in the 60-trading-day window prior to the IPO filing, and an indicator for whether a firm is VC-backed, syndicate size, underwriter reputation, and log filing amount. Also included in each regression are the levels and 2-way interactions for the HQ state not in LEHD indicator and High-tech indicator variables. The parameter estimates for the control variables are not reported due to the U.S. Census restrictions on the number of exported estimates. Per Census Bureau disclosure rules, observations and estimates are rounded. Standard errors are reported in parentheses and are clustered by year-quarter and 2-digit SIC code. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Wages

Dependent Variable:	3-Year Growth in Employee Wages$_{t,t+3}$			New Hire Wage Premium
Type of Workers:	Pre-IPO	Pre-IPO & Stay at $t+3$	Pre-IPO & Leave by $t+3$	Post-IPO Hires
	1	2	3	4
IPO	-0.088	-0.087	-0.126	0.099***
	(0.305)	(0.250)	(0.295)	(0.034)
IPO X HQ State Not in LEHD	-0.252	-0.250**	-0.196	-0.049
	(0.162)	(0.121)	(0.167)	(0.044)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Number of Observations	2,400	2,400	2,400	2,400
F-statistic	13.5	13.5	13.5	13.5

Panel B. Entrepreneurship

Dependent Variable:	Departure Rate to Entrepreneurship$_{t,t+3}$			
Type of Workers:	All	High Wage	Low Age	All
	1	2	3	4
IPO	0.038*	0.086***	0.063***	-0.015
	(0.023)	(0.019)	(0.020)	(0.034)
IPO X HQ State Not in LEHD	0.042	0.011	0.065	0.040
	(0.031)	(0.026)	(0.055)	(0.033)
IPO X High-tech				0.088**
				(0.044)
IPO X HQ State Not in LEHD X High-tech				0.020
				(0.061)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Number of Observations	2,400	2,400	2,400	2,400
F-statistic	13.5	13.5	13.5	5.63

IA-III.   Out-of-Sample Analysis of Labor Attrition from Private Employment

The goal of this appendix is to better understand the magnitude of worker attrition from private employment over time. In our data, 23% of the workers observed in the LEHD data in the quarter preceding the IPO (the pre-period) have dropped out of the LEHD data by the time of the quarter three years following the pre-period (the post-period). The LEHD data primarily samples workers in private companies; as such, the main drivers of attrition are when workers 1) move out of the labor force, 2) become unemployed, and/or 3) move to public sector employment. In addition, our coverage of the LEHD is limited to 31 states; moving into states not included in our sample is therfore another driver of this attrition. To validate the use of the LEHD in a longitudinal manner and address any concerns regarding this rate of attrition, we compare the rate in our sample to a benchmark rate of attrition calculated using out-of-sample data. To construct an out-of-sample benchmark, we use the Current Population Survey (CPS). To the best of our knowledge, the CPS is the U.S. source best suited to construct this benchmark. First, the CPS is the current standard created by the U.S. Census Bureau and Bureaur of Labor Statistics (BLS) for national employment statistics. Second, the CPS is longitudinal in nature, allowing us to measure employee attrition over time. We find that within the CPS data, after one year only 83% of the original private sector workers are still reportedly employed in the private sector. In other words, 17% of the private sector workers drop out from private employment after one year. Comparing the CPS's *1-year* attrition rate of 17% to the *3-year* attrition rate of 23% of the workers in our IPO sample indicates that our attrition rates are not abnormally high. Moreover, this 83% is a conservative estimate, as it is calculated as a proportion of the civilians who respond to the survey again after one year. When we account for non-response bias from individuals in the CPS, only 53% of the original private sector workers are still observed in the private sector after one year. Non-response could be driven by a number of factors. However, to the extent that non-response is more common for workers who have exited the workforce, this suggests an even higher attrition rate in the CPS data. In the following section, we explain the data, variables, and sample construction used to calculate CPS worker attrition rates.

A. Data Description

The standard data set used to investigate labor mobility is the CPS, conducted on a monthly basis by the U.S. Census Bureau.[2] We use a cleaned version generously provided by IPUMS.[3] The CPS surveys a household for a 16-month time interval, as follows. During the first four months, recipients respond to a survey each month. This is followed by an eight-month gap of no activity. In the final four months, recipients again respond to a monthly survey. Full response entails completing the survey eight times.

B. Sample Restrictions

We start with the universe of individuals 15 to 65 years old observed in IPUMS-CPS between 1990 and 2006. We drop observations for individuals whose first interview was before 1990, resulting in a sample of 18 million individual-month observations and 3.6 million unique individuals. We then reshape the data into person level observations through the variable CPSIDP, an IPUMS-CPS defined variable that uniquely identifies individuals across CPS samples. One limitation, as noted by IPUMS, is that CPSIDP does not trace individuals perfectly. There are some cases in which the sex or race of an individual changes over time, or the individual's age changes at an inconsistent rate. These may be due to linking error, or through inconsistent sample responses. To address this issue, we drop individuals whose race or sex changes over time. We also remove individuals if, at any point during the eight samples, their age differs (by more than 2 years) from their mean age across the sample. This leads to us dropping about 200,000 out of 3.6 million observations (about 5%). We also remove individuals who are not classified as civilians, and who are younger than 15 years old during the first month they are surveyed.

Of the 3.4 million observations left, we drop any observations where data for the individual are missing for the first month the household is surveyed, leaving a final sample of 2.1 million observations, for civilians between the ages of 15 and 65 between 1990 and 2006.

We provide summary statistics in Table IA11 for the initial employment status of individuals in our sample during the first month they are surveyed. Table IA11 shows that 36% of respondents are in for-profit private employment, which includes workers in our sample of IPO filing firms and is the focus group for our attrition analysis going forward.

While the CPS has the benefit of being a nationally representative survey conducted by the Census Bureau and the BLS, some respondents do not answer the follow-on surveys. The response

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[2]A detailed description of the sampling procedure for the CPS is available at https://cps.ipums.org/cps/intro.shtml

[3]Sarah Flood, Miriam King, Steven Ruggles, and J. Robert Warren. Integrated Public Use Microdata Series, Current Population Survey: Version 5.0 dataset. Minneapolis, MN: University of Minnesota, 2017.

rate over time is shown in Table IA12 and is comparable to Drew, Flood, and Warren (2014).[4] Of all respondents to the first interview, 87% (67%/64%) do not fill out the follow-on surveys in 3 (12/15) months. The attrition in individual response rates in the CPS may be due to migration, birth, death, divorce, or non-response (see Drew et. al., 2014). In all statistics going forward, we provide the attrition rates among both groups: 1) workers who respond to the future surveys, and 2) all responders to the initial survey.

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TABLE IA11

Labor Market Status as of the First Interview

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	Percentage	# Observations
Not in Labor Force	24.1	500,895
In Labor Force	75.9	1,579,097
Unemployed	4.4	91,167
Employed	71.5	1,487,930
Private	36.3	756,043
Government	10.9	226,082
Self-Employed	8.3	173,368
Other	16.0	332,437
Total Overall	100.0	2,079,992

C. Private Sector Worker Attrition Over Time

We are interested in how many workers in private for-profit employment continue to stay in private for-profit employment in the future. Ideally, to match the horizon of departures to new firms from the IPO filing firms in our sample, we would want to see how many of the workers stay in private employment over a three year window. Unfortunately, the CPS data only track peoples for the maximum of 15 months. Therefore, we estimate the fraction of private for-profit employees

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[4]Drew, R., J. A, S. Flood, and J. R. Warren, 2014, "Making full use of the longitudinal design of the Current Population Survey: Methods for linking records across 16 months", *Journal of Economic and Social Measurement*, 39(3). By matching CPSIDP, Drew et. al. (2014) find that 89% of individuals who respond to the CPS survey first in January 2009, respond to the survey again during the second, third, or fourth time they are surveyed, and that after a year, 68% of them fill in the survey. Their measure of retention rate decreases slightly after they correct for discrepancies in age, race, and sex in CPSIDP as we have done.

TABLE IA12

CPS Response Rate

Response Rate	Time
100.0 %	Initial
93.0	After 1 month
89.9	After 2 months
87.2	After 3 months
67.4	After 1 year
66.6	After 13 months
65.4	After 14 months
64.2	After 15 months

who are remain engaged in private for-profit employment after 12 months and report the results in Table IA13.[5]

Overall, after three months, of all individuals who respond to the survey, 83% of workers initially employed by the private sector remain in the private sector. Including non-responding workers, decreases this proportion to 54%. Comparing the CPS's *1-year* private for-profit worker attrition of 17% (=100% – 83%) to the *3-year* attrition of 23% of the workers in our IPO sample makes us believe that our attrition rates are not abnormally high.

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[5]We classify individuals as currently employed in the private sector, if during the first month in which they are interviewed, CLASSWKR = 22 (i.e., the respondent's job is in the for-profit private sector) and EMPSTAT = 10/12, indicating that the civilian is currently employed.

TABLE IA13

Labor Transitions after 1 Year

	Percentage (of available data)	**Percentage (of all private workers who responded initially)**	**# Observations**
Stayed in private	83.1	54.3	410,282
Moved to government	2.1	1.4	10,480
Moved to self-employed	3.1	2.0	15,384
Moved to other employment	2.3	1.5	11,496
Total responses (1 Year later)	100.0	65.3	494,007
Individuals with no data (1 Year later)	–	34.7	262,036
Total # of private workers responding initially	–	100.0	756,043