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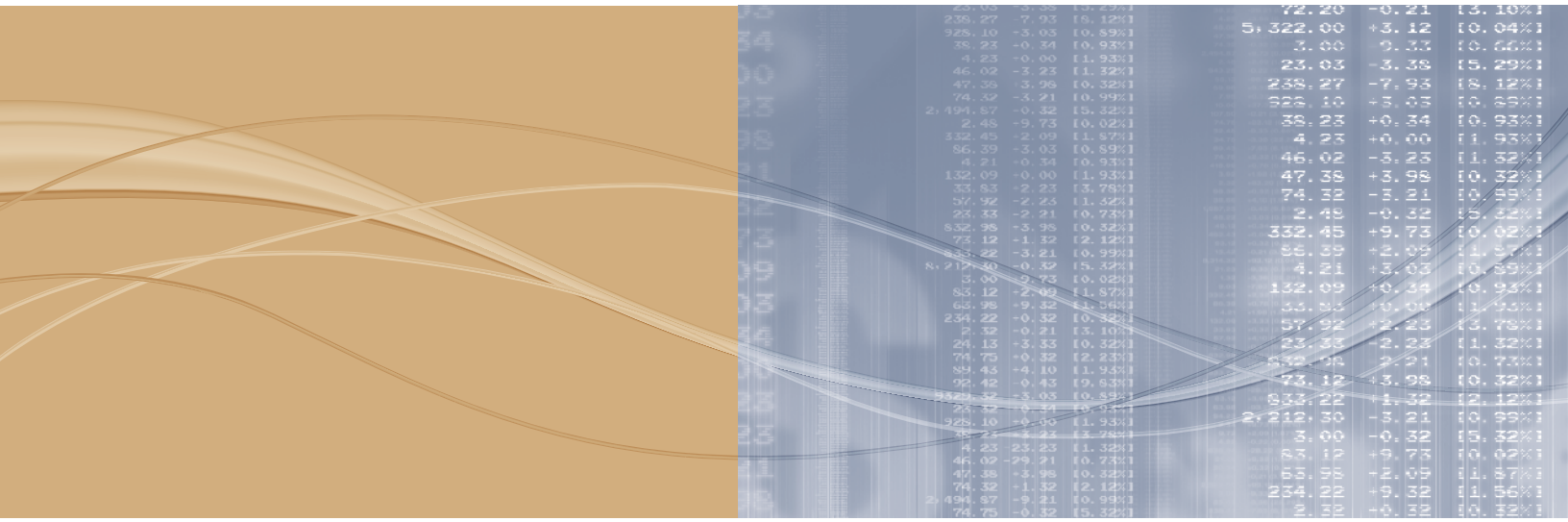
Post-IPO EMPLOYMENT and REVENUE GROWTH

for U.S. IPOs,

June 1996–2010



Post-IPO Employment and Revenue Growth for U.S. IPOs, June 1996–2010
Report for the Kauffman Foundation

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Executive Summary

There is significant concern among policymakers about the health of the Initial Public Offering (IPO) market. From 1980–2000, an average of 298 domestic operating companies went public in the United States each year, but from 2001–2011, the number of new listings fell to an average of only ninety per year.[1] Despite the acknowledged importance of stock markets in raising capital for newly listed firms, there has been surprisingly little research examining the impact of these newly listed entrepreneurial firms on the U.S. economy in terms of revenues or employment. This report examines the employment and revenue growth performance of all domestic operating companies undertaking an IPO on American markets from June 1996, when the SEC's EDGAR site started making IPO prospectuses available online, through 2010.

During this period, according to our definitions, 2,766 domestic operating companies went public. These 2,766 companies employed 5.062 million people prior to going public and 7.334 million in 2010, an increase of 2.272 million employees, or 45 percent. This increase in post-IPO employment works out to 822 jobs added per firm. Note that, in contrast to the conventional wisdom, most of the jobs were created prior to the IPO. In dollars of 2011 purchasing power, in the aggregate these 2,766 companies had $1.32 trillion in annual sales in the year before going public, and $2.58 trillion in sales in fiscal 2010, a 96 percent increase. Inflation-adjusted revenue grew faster than employment due to high productivity growth. The average company going public raised $162 million in inflation-adjusted proceeds, not including an additional $27 million raised by selling shareholders. Since the average company going public created 822 jobs after the IPO, on average every job required an investment of approximately $200,000.

In addition to reporting the employment and revenue growth for all companies going public, we categorize firms into emerging growth companies ("EGCs"), which we define as domestic operating companies less than thirty years old that are not spinoffs, rollups, buyouts, or demutualizations; and other companies (from here on, "others").[2] The aggregate employment for the subset of 1,700 EGCs increased from 651,000 employees prior to the IPO to 1.666 million employees in 2010, a 156 percent increase. For these EGCs, aggregate pre-IPO annual sales increased from an inflation-adjusted $134 billion to $481 billion in 2010, a 259 percent increase. Among the EGCs, growth was not uniform. There were standout performers, particularly in technology, such as Amazon, eBay, and Google, and in retail, such as Texas Roadhouse, that are responsible for outsized returns. The 1,066 other non-EGC IPOs, which are frequently larger companies, are responsible for employing more than 5.6 million people and generating $2.1 trillion in annual revenue in 2010, although most of their employees were hired prior to going public.

We also examine the fate of all of the EGCs going public. Ten years after the IPO, only 29 percent of the EGCs from 1996–2000 remained as independent public companies. Of those that do not survive, being acquired is much more common than going bankrupt. The survival rates, however, differ markedly by industrial sector.

In geographic terms, there is an extraordinary concentration of firms making IPOs in certain states. California is the home to 46 percent of all EGC IPOs, while Massachusetts has the highest per-capita number of EGC IPOs. While New York and Texas also have significant numbers of EGC IPOs, on a per-inhabitant basis they are not as impressive. Within states, there are regions—in particular, the San Francisco Bay Area and Greater Boston—that exhibit extremely high concentrations of EGC IPOs.

While aggregate statistics reporting revenue or employment increases provide valuable insights, there are particular firms in our population, such as Amazon, eBay, and Google, that are examples of Schumpeterian innovation, whereby a firm or group of firms can lead reorganizations of entire economic sectors. Their influence cannot be reduced to their internal performance.

1. Throughout this report, we exclude all foreign companies going public in the United States, banks and S&Ls (most of which are conversions from mutual companies), Real Estate Investment Trusts (REITs), closed-end funds, limited partnerships, IPOs with an offer price below $5 per share, unit offers, small best efforts offers, and Special Purpose Acquisition Companies (SPACs).

2. Our definition of emerging growth companies differs from the definition used in the 2012 Jumpstart Our Business Startups (JOBS) Act. This bill defines EGCs to be any company with annual revenue of less than $1 billion. Ninety-three percent of June 1996–December 2010 domestic operating company IPOs, excluding penny stocks and unit offers, had inflation-adjusted sales of less than $1 billion. In contrast to the 93 percent of IPOs that qualify as EGCs using the Congressional bill's definition, only 61 percent (1,700/2,766) of IPOs in this report are classified as EGCs. Our definition of EGCs includes Google and Facebook, which the Congressional definition excludes, but excludes all buyout-backed IPOs.

Introduction

From 1980–2000, an average of 298 domestic operating companies went public in the United States each year, but in 2001–2011, this number fell to an average of only ninety per year. The drop has been even more severe among small company initial public offerings (IPOs), and has occurred in spite of a doubling in real GDP during this time period, which would generate an increase in the number of IPOs per year if the ratio of IPOs per unit of real GDP stayed constant. This drop in IPO activity has generated concern among policymakers for several reasons, and has led to the Jumpstart Our Business Startups (JOBS) Act, signed into law by President Barack Obama in April 2012.

The first reason for concern among policymakers is that it has now been well established that the most significant employment creation has been by fast-growing firms, both in the United States and abroad (Acs and Mueller 2008; Audretsch and Dohse 2007; Bottazzi and Da Rin 2002; Henrekson and Johansson 2009). For rapidly growing young firms, IPOs long have been considered important for raising capital to fuel continued growth.

Second, there is a widespread belief that most jobs are created by small companies.[3] Because the drop in IPO activity has been most severe among small firms, policymakers have expressed concern that there has been an effect on aggregate employment. Gao, Ritter, and Zhu (2012) document that the average number of small-company IPOs per year in 2001–2009 has fallen by more than 80 percent relative to the annual average during 1980–2000.[4]

Third, an IPO is a key rite of passage for many entrepreneurial firms, and allows founders and financial backers to begin cashing out. Furthermore, venture capital and private equity firms normally are contractually mandated by their limited partners to exit their portfolio companies within ten to twelve years of the investment, and thus are motivated to either sell out or take a company public.

Finally, in addition to the direct employment effects, there is a perception that many companies going public, especially those in the biomedical and technology industries, generate positive externalities and consumer surplus.

Surprisingly, there has been little prior research examining the impact of newly stock market-listed entrepreneurial firms on the U.S. economy in terms of revenues or employment. One widely cited study concludes that there were as many as 22.7 million job losses due to the shortfall of IPOs since 1996. The study bases this conclusion upon a "select" sample of twenty-five unidentified IPOs. [5]

3. David Birch was the first scholar to demonstrate the critical importance of small firms for employment and to single out the importance of new firms that were rapidly growing (Birch, *et al.*, 1995). Recent work by John Haltiwanger, Ron S. Jarmin, and Javier Miranda (2012), "Who Creates Jobs? Small vs. Large vs. Young," *Review of Economics and Statistics*, forthcoming, suggests that young firms, most of which are small, are net job creators, but older firms, whether large or small, are not.

4. See Table 1 of Xiaohui Gao, Jay R. Ritter, and Zhongyan Zhu (2012), "Where Have All the IPOs Gone?" They define small and large companies in terms of whether the inflation-adjusted (using dollars of 2009 purchasing power) sales in the last twelve months prior to going public is above $50 million.

5. Page 2 of David Weild and Edward Kim's 2009 "A Wake-up Call for America" states that "Up to 22 million jobs may have been lost because of our broken IPO market." On page 26, they explain the assumptions behind this number. Crucially, they assume, based on twenty-five "selected" IPOs since 1996, that each IPO has a 17.8 percent compounded annual growth rate (CAGR) of employees and that the median number of employees at the time of the IPO is 1,372. They assume that the number of IPOs per year would stay at the 1996 peak-year level. Thus, the 1997 actual number of 569 IPOs has "234 'lost' from the 1996 peak of 803 IPOs. (234)×(1,372 employees growing at 17.8 percent for eleven years) = 1,946,113 potential jobs lost." In other words, they assume that over ten years, each IPO would increase employment by $(1.178^{10} - 1)\times 100$ percent = 415 percent, whereas we report in Table 1 that the average ten-year employment growth for the 1,857 IPOs from June 1996–December 2000 is 60 percent, a CAGR of 4.8 percent. Weild and Kim do not report which twenty-five selected IPOs they use, but they obviously have selected some of the most successful companies, and then assume that thousands of companies that didn't go public would have been as large and successful as their unrepresentative group of twenty-five actual IPOs. On page 27, they calculate the 22.7 million number, which has been used in the IPO Task Force's December 2011 presentation by Kate Mitchell to the U.S. Senate Committee on Banking, Housing, and Urban Affairs and several *Wall Street Journal* articles. On page 27, after mentioning several caveats, Weild and Kim state, "Though 22 million may seem to be a staggering number on its own, we believe it is a reasonable estimate in the context of long-term historical employment growth in this country." The number of 1996 IPOs (803) that Weild and Kim use differs from Gao, Ritter, and Zhu's (2012) 643 domestic operating company IPOs. The difference in numbers is apparently due to the inclusion by Weild and Kim of penny stocks and unit offers, as well as foreign companies going public in the United States (sixty-four IPOs in 1996), and bank and S&L conversions from mutual to stock ownership.

This report examines the employment and revenue growth performance of all domestic operating companies that have made an IPO from June 1996 through 2010 in the United States. During this period, 2,766 domestic operating companies went public in the United States.[6] These 2,766 companies employed 5.062 million people prior to going public and 7.334 million in 2010, an increase of 2.272 million employees, or 45 percent. This increase in post-IPO employment works out to 822 jobs per firm. In dollars of 2011 purchasing power, in the aggregate these 2,766 companies had $1.32 trillion in annual sales in the year before going public, and $2.58 trillion in sales in fiscal 2010, a 96 percent increase. Inflation-adjusted revenue grew faster than employment due to high productivity growth.

One can use our numbers, in a mechanical sense, to calculate the lost jobs from the slowdown in IPO activity. If the volume of IPOs per year during 1980–2000 had been maintained during 2001–2011, i.e., 298 domestic operating company IPOs per year rather than ninety per year, and if each of the 208 additional IPOs per year had created 822 jobs, the 2,288 additional IPOs would have created 1.881 million more jobs, a far smaller number than the 22.7 million figure that has been repeatedly cited.

There are some strong assumptions that go into the above calculation. First, since the number of years in which to grow would have been shorter than for the firms that went public in the late 1990s, the jobs created through 2010 probably would be lower. Second, there is an assumption that the average quality of firms going public would remain the same as those that actually did go public. In other words, that there would have been additional eBays, Amazon.coms, and Googles if there had just been more IPOs. Third, that the people that would have been hired would not have been doing something else. In other words, there is an implicit assumption that a mass army of would-be engineers, scientists, and marketing experts is sitting at home watching television. And fourth, that the capital invested when a company raises funds in an IPO would not otherwise have been invested in job-creating activities. The average company that conducted an IPO during our sample period raised $162 million in inflation-adjusted dollars, and if there were 2,288 more IPOs of the same average size, $370 billion of capital would have been pulled from other uses.

In addition to reporting the employment and revenue growth for all companies going public, we categorize firms into emerging growth companies ("EGCs"), which we define as domestic operating companies less than thirty years old that are not spinoffs, rollups, buyouts, or demutualizations, and others (from here on, "others").[7] The aggregate employment for the subset of 1,700 EGCs increased from 651,000 employees prior to the IPO to 1.666 million employees in 2010, a 156 percent increase. For these EGCs, aggregate pre-IPO annual sales increased from an inflation-adjusted $134 billion to $481 billion in 2010, a 259 percent increase. Not surprisingly, these younger and smaller companies on average grew faster than other companies going public. The 1,066 other IPOs increased employment by only 29 percent and revenue by 78 percent.

We assess performance over three, five, and ten years, and through 2010, to provide a better understanding of not only the short-run, but also the longer-run impacts. Measuring the longer-run impacts is vitally important, because the large-scale benefits and societally significant measures of success can take a decade or longer to appear.

Most of the employment growth occurs in the first five years after the IPO. For the 2,354 IPOs from 1996–2005, in the first five years after going public, the aggregate number of employees

6. Throughout this report, we exclude all foreign companies going public in the United States, banks and S&Ls (most of which are conversions from mutual companies), Real Estate Investment Trusts (REITs), closed-end funds, limited partnerships, IPOs with an offer price below $5 per share, unit offers, small best efforts offers, and Special Purpose Acquisition Companies (SPACs).

7. Our definition of emerging growth companies differs from the definition used in House of Representatives bill 3606 or Senate bill 1933, the "Reopening American Capital Markets to Emerging Growth Companies Act of 2011." These bills define EGCs to be any company with annual revenue of less than $1 billion. Ninety-three percent of June 1996–December 2010 domestic operating company IPOs, excluding penny stocks and unit offers, had inflation-adjusted sales of less than $1 billion (January 2011 purchasing power, using the CPI). In contrast to the 93 percent of IPOs that qualify as EGCs using the Congressional bills' definition, only 61 percent (1,700/2,766) of IPOs in this report are classified as EGCs. Our definition of EGCs includes Google and Facebook, which the Congressional definition excludes, but excludes all buyout-backed IPOs.

increased by 39 percent, a compound annual growth rate of 6.7 percent. When we restrict our analysis to the 1,857 companies that went public during June 1996–December 2000, combined employment grew by 60 percent over the following decade, a compound annual growth rate of 4.8 percent. For the EGCs that went public during this period, their combined employment grew by 161 percent, a compound annual growth rate of 10.1 percent.

In this report, we examine various aspects of these firms in more detail. While we do report data for the other firms, the greatest attention is given to the EGCs, as they are, often, the firms that create Schumpeterian growth. For certain of these firms, such as Amazon, eBay, Google, Salesforce.com, and Yahoo!, their impacts extend far beyond either their employment or revenue growth and create entirely new economic ecosystems. These impacts are difficult to capture statistically.

Methodology and Assumptions

We include this brief methodology and assumption section here, but attach an Appendix with greater detail. All of the data reported in this study are taken from SEC filings related to the IPO, later annual reports, and delisting filings (though identifying the reasons for delisting sometimes required further Internet searches) for emerging growth company IPOs, but Compustat is the primary data source for the other company IPOs. All IPO data are taken from the final prospectus filed prior to the IPO or the Thomson Reuters new issues database. We include both regular filers and so-called small business IPOs (firms having filed an SEC form SB-2, rather than a form S-1, registration). The data include all firms filing for an IPO from June 1, 1996, through December 31, 2010—the period during which all IPO filings must be electronic (the one exception is 37 SB-2 filers, which were exempt from this requirement for several months after the June 1996 deadline; thus, we omit them).

While we examine all domestic operating companies undertaking an IPO, the focus of our study is upon emerging growth companies. Identifying and classifying these firms is difficult and requires judgments, all of which were based upon inspection of the IPO prospectus.

Because one of our concerns is measuring the employment and revenue contribution of new firms, for our EGCs we exclude all firms that were thirty years or older at the time of the IPO. In some respects, this is arbitrary, but it does serve to focus our attention on newer firms. This exclusion meant that most very large firms (at the time of the IPO) are excluded from the EGC analysis. For example, one of the largest firms that went public during our sample period is United Parcel Service (UPS), founded in 1907, which could hardly be considered a new entrepreneurial firm.

Acquisitions and Bankruptcy Assumptions

For every firm, we identify the firm's fate, which has three possibilities: 1) it continued to exist as a publicly traded firm on December 2010, 2) it no longer existed due to bankruptcy or a distress delisting, or 3) it no longer existed because it was acquired by another entity or went private and was no longer publicly listed. One caveat is that some mergers and acquisitions are roughly the equivalent of bankruptcy as the firm is sold for a trivial sum. Determining whether an acquisition is the functional equivalent of a bankruptcy is occasionally open to interpretation.

To estimate the continuing employment or revenue contribution of firms that are either acquired or delisted, it is necessary to make some assumptions about their future performance. We assume that, after an acquisition, the number of employees for a firm continues to be constant for all years after the last available year's data. Thus, if company A had 100 employees pre-IPO, 150 employees at the end of its next fiscal year, and then was acquired, we would treat the company as having 150 employees in all subsequent years. If the company is delisted at a price of less than $2 per share and not acquired, we assume that the company failed and that it had zero employees in subsequent years.

All bankrupt firms are assumed to be disbanded and have no employees, despite the fact that some of the firms or parts of firms may have been acquired out of bankruptcy or gone forward under debtor-in-possession operation. The total number of employees of all the bankrupt and delisted EGCs was 151,785 persons in the last year prior to the event. Using Internet searches, we examined the fate of each of the largest ten bankruptcies and sampled another fifteen. We found the number of employees that were retained varied dramatically from apparently none to a significant percent (see Appendix 3 for detailed discussion). We decided not to apply an arbitrary percentage of retained

employees and assumed that these companies no longer had any employees. The assumption that firms that are delisted for distress reasons are liquidated imparts a downward bias to our growth-rate estimates.

For firms that are subsequently acquired, we assume that their employment and inflation-adjusted revenue is frozen at the last reported level prior to the event.

Another significant issue for calculating employment and revenue growth is when a firm in our database acquires another firm. Unfortunately, only in a very few cases are the number of employees in the acquired firm announced, and many acquisitions are of private firms for which no employee count is publicly available. In this scenario, the growth in the acquiring firm's employment and revenues overstates the contribution to the economy's growth. This is an unavoidable limitation due to the data reported. Because growth due to acquisitions overstates a firm's contributions to aggregate employment growth, in this case our growth rate estimates may be overstated.

Other Definitions

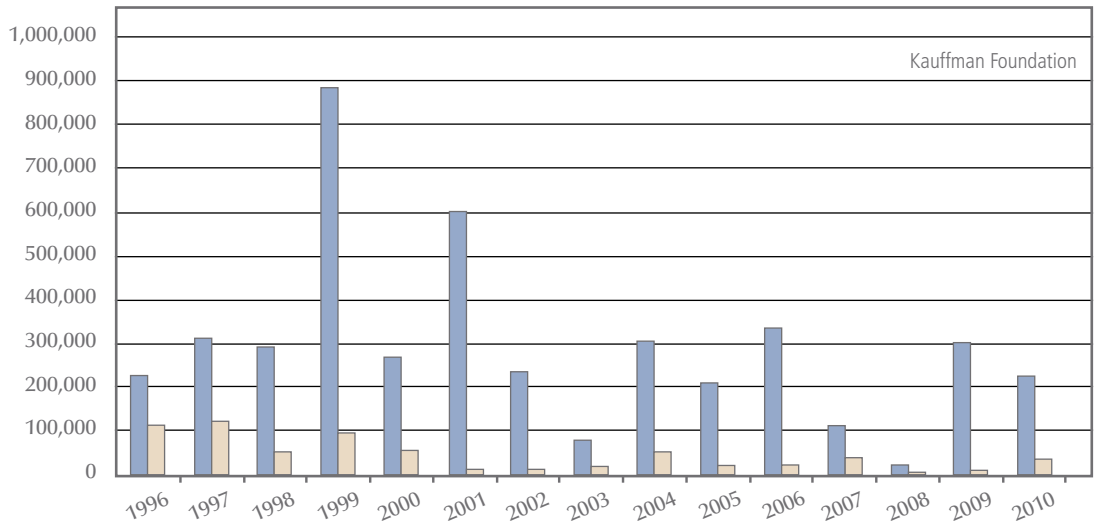
A firm is considered "venture capital-financed," if it had at least one self-identified venture capitalist on the board of directors. If a board member was affiliated with a self-identified private equity (buyout) firm (and there was no venture capitalist on the board), it was not considered a venture capital-financed firm. Some firms with "growth capital" financial backers are difficult to classify.

Each firm is identified by the primary standard industrial classification (SIC) code that it reported in its IPO filing. All addresses are for the firm's headquarters as reported in the prospectus.

IPOs and Employment

There has been significant recent attention devoted to the number of jobs created by new firms, many of the most successful of which file for an IPO. For each cohort year, Figure 1 shows the aggregate pre-IPO employment of EGCs by cohort year in tan (on the right) and the aggregate pre-IPO employment of other

Figure 1. Pre-IPO Employment by Firms Undertaking an IPO in Each Cohort Year:
Emerging Growth Companies in Tan, Other Companies in Blue, 1996 through 2010



companies in blue (on the left). In every year, the aggregate pre-IPO employment of other company IPOs is higher, and usually much higher, than for EGC IPOs.

In Panel A of Table 1, using all domestic operating company IPOs from June 1996–December 2010, we report the aggregate pre-IPO employment of EGC IPOs, other IPOs, and all IPOs. The aggregate numbers confirm what is visually shown in Figure 1: EGC IPOs comprise a relatively small fraction of the aggregate

Table 1. Aggregate Employment of Domestic Operating Company IPOs

Panel A: Employment and employment growth through the end of fiscal 2010

All IPOs from June 1996–Dec. 2010	Emerging Growth N=1,700	Other N=1,066	Total N=2,766
Pre-IPO Employment	651,210	4,410,394	5,061,604
Post-IPO Growth by 2010	1,014,572	1,257,836	2,272,408
Percentage Growth	156%	29%	45%
Total in 2010	**1,665,782**	**5,668,230**	**7,334,012**

Panel B: Employment and employment growth through the end of the third anniversary

IPOs from June 1996–Dec. 2007	N=1,635	N=994	N=2,629
Pre-IPO Employment	606,452	3,859,762	4,466,214
Post-IPO Growth 3 Years after IPO	699,118	903,490	1,602,608
Percentage Growth	115%	23%	36%
Compound Annual Growth Rate	29.1%	7.3%	10.8%
Total 3 Years after IPO	**1,305,570**	**4,763,252**	**6,068,822**

Panel C: Employment and employment growth through the end of the fifth anniversary

IPOs from June 1996–Dec. 2005	N=1,487	N=867	N=2,354
Pre-IPO Employment	547,128	3,411,660	3,958,788
Post-IPO Growth 5 years after IPO	739,079	785,493	1,524,572
Percentage Growth	135%	23%	39%
Compound Annual Growth Rate	18.6%	4.2%	6.7%
Total 5 years after IPO	**1,286,207**	**4,197,153**	**5,483,360**

Panel D: Employment and employment growth through the end of the tenth anniversary

IPOs from June 1996–Dec. 2000	N=1,245	N=612	N=1,857
Pre-IPO Employment	437,934	1,981,661	2,419,595
Post-IPO Growth 10 years after IPO	704,266	743,108	1,447,374
Percentage Growth	161%	37%	60%
Compound Annual Growth Rate	10.1%	3.2%	4.8%
Total 10 years after IPO	**1,142,200**	**2,724,769**	**3,866,969**

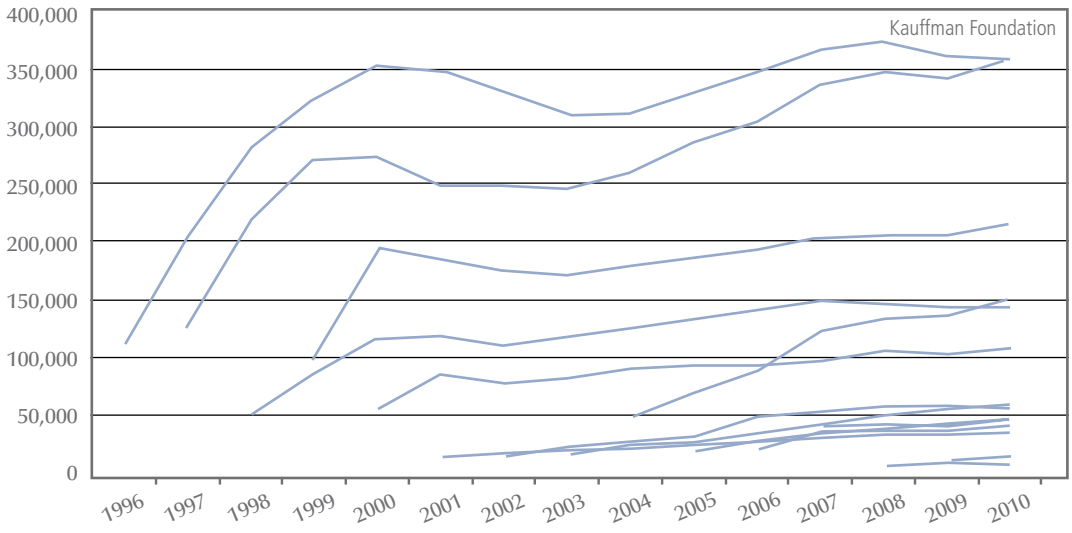
Pre-IPO employment is the number of employees listed in the prospectus. Employment in year +T is the employment (usually from the 10-K report) T years after the year of the IPO. For example, year +3 is fiscal year 2004 for IPOs from 2001. If a company was delisted for bad reasons (e.g., failure to meet Nasdaq's net capital requirements) and stopped filing financial statements, we assume that employment fell to zero and stayed there. If a company is acquired, we assume that its employment is frozen at the last available number.

pre-IPO employment of all IPOs: 651,000 jobs out of 5,061,000 total jobs, 13 percent of the total. Inspection of Panels C and D of Table 1 shows that the percentage growth in employment per year is fastest immediately after the IPO, possibly reflecting the cash infusion associated with the IPO.

In Panel D of Table 1, using the 1,857 IPOs from June 1996–December 2000 for which ten years of post-IPO experience is available, we report that the total employment increased by 60 percent, a compound annual growth rate (CAGR) of 4.8 percent per year. The panel also reports that, for the EGCs, the CAGR is a much higher 10.1 percent. For the EGCs, the numbers also can be expressed in a manner that gives the percentage of 2010 employment that was created after the IPO. With 1,142,200 total employees in 2010, the 704,266 employees that were hired after the IPO represent 62 percent of the 2010 workforce. This 62 percent number is in contrast to a widely quoted number that 90 percent of job creation occurs after the IPO.[8] The 62 percent of 2010 jobs also can be expressed as post-IPO employment growth of 161 percent, whereas the 90 percent number implies an average increase of 900 percent after the IPO. The 90 percent number comes from the annual *Venture Impact: The Economic Importance of Venture Capital-Backed Companies to the U.S. Economy* report published by IHS Global Insight and paid for by the National Venture Capital Association.[9]

Traditionally, one of the most important purposes of an IPO is to raise capital to finance firm growth. The IPO also provides liquidity for investors and firm insiders that can sell their stakes in the firm either at the time of the IPO or later on in open market or follow-on transactions. For venture capitalists, this is especially important as it completes what Gompers and Lerner (1999) term the "venture capital cycle." In Figure 2, for EGCs, we show the cumulative amount of employment provided by the firms from each cohort.

Figure 2. Employment at the Time of the IPO and Post-IPO Employment by Cohort Year, Emerging Growth Company IPOs, 1996–2010



8. For example, the April 7, 2012, *Wall Street Journal* has an interview with Kate Mitchell, "How Silicon Valley Won in Washington," about the JOBS Act (Freeman, 2012). The article states, without questioning, "To sell politicians on the benefits of allowing startups to grow into public companies, the [IPO] task force pointed to research showing that, when such firms go public, more than 90 percent of job creation happens after the IPO." For the EGCs, 61.7 percent of the employment ten years out was created *after* the IPO (a 161 percent increase, not a 900 percent increase), and for all IPOs, 37.4 percent of the employment was created after the IPO (a 60 percent increase).

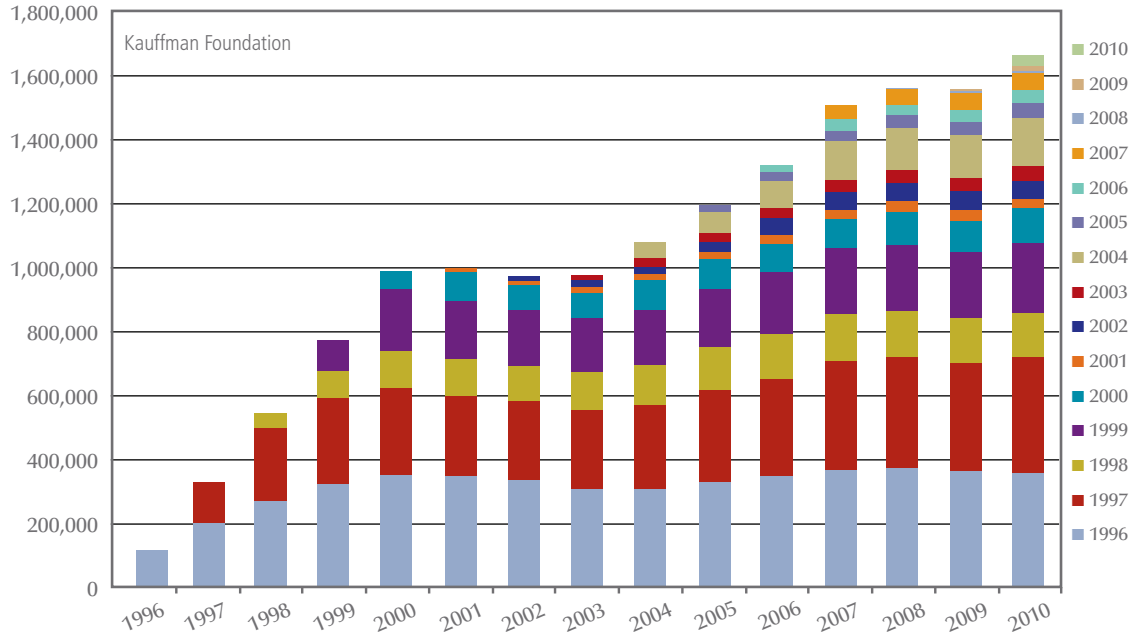
9. On page 4 of the 2011 edition, the statement is made that, "IHS Global Insight research suggests that 92 percent of job growth by young companies occurs after their initial public offerings." No further details are given. It is possible that the 92 percent number is calculated from a subsample of extremely successful venture capital-backed companies, and then this number is applied to all venture-backed IPOs or all IPOs. IHS is an advisory, consulting, and forecasting firm.

Immediately after the IPO, firms normally experience rapid growth. This is not surprising because the capital they raised can be used to hire more personnel. This was especially true in the 1990s during the Internet Bubble, when the mantra was "grow rapidly or fail." For the 1996–2000 cohorts, employment grew rapidly in the first few years after the IPO. As Figure 2 shows for these cohorts, the post-2000 Bubble collapse period was one of significant job loss, though employment recovered later in the decade and in particularly dramatic fashion for the 1996 and 1997 cohort. The phenomenon of significant growth post-IPO continues for cohorts that had an IPO after 2000, but it was far more subdued. Interestingly, after 2000 none of the cohorts except the 2004 cohort, which includes Google, exhibited especially dramatic growth. At this point, we have no explanation for this differential behavior of the earlier and later cohorts, but with fewer firms in the later cohorts, this may be explained by fewer opportunities for "home-run" firms.

Figure 3 shows the aggregate employment of these EGC IPOs over time. The contribution of the IPOs for each cohort year to aggregate employment in a calendar year can be found by following the color of that cohort year. The first number shown for each cohort is the aggregate pre-IPO employment for the EGC IPOs from this year. As Figure 3 shows, the number of employees grew every year except 2002 and 2009, when there was a slight decrease in total employment. As of 2010, these EGC IPOs from June 1996 through 2010 employed more than 1.66 million people, or 1.19 percent of all U.S. jobs (December 2010 total U.S. civilian employment was 139,200,000).[10] After 2000, there have been only a small number of new EGC IPOs per year, so the growth in job contributions by newly public firms is fairly small.

The contribution of the 1996 and 1997 cohorts is remarkable because, by 2010, they provided nearly 43 percent of the total employment of all of the emerging growth companies that went public between mid-1996 and 2010. The 1999 cohort provided almost 13 percent, and the 2004 cohort added another 9 percent. The 2004 cohort experienced remarkable growth, as it contained three firms—Google, Salesforce.com, and Texas Roadhouse—that experienced significant growth.

Figure 3. Annual Employment by Cohort Year, Emerging Growth Company IPOs, 1996–2010



10. Firms generally do not report how many of the employees are in the United States, so we are assuming that all of the employees are based in the United States, which overstates the contribution to U.S. employment.

IPOs and Revenues

In Table 2, we report the aggregate pre-IPO last twelve months' revenue and aggregate annual revenue in 2010 and, respectively, three years, five years, and ten years after the IPO. All of the numbers are expressed in terms of January 2011 purchasing power, using the Consumers Price Index (CPI). As with the employment numbers in Table 1, Table 2 shows that post-IPO revenue growth is higher in percentage terms for the EGC IPOs than for the other IPOs, but the larger starting values for the other IPOs dominate in terms of the dollar value of the increase in sales. Table 2 shows higher percentage growth rates for revenue than Table 1 showed for employment, reflecting productivity growth in the years after the IPO, so that revenue per employee grows, on average.

Table 2. Aggregate Revenue in Millions of 2011 Dollars of Domestic Operating Company IPOs

Panel A: Revenue and revenue growth through the end of fiscal 2010

All IPOs from June 1996–Dec. 2010	Emerging Growth N=1,700	Other N=1,066	Total N=2,766
Pre-IPO Revenue	$133,996	$1,181,901	$1,315,897
Post-IPO Growth by 2010	$346,588	$921,454	$1,268,042
Percentage Growth	259%	78%	96%
Total in 2010	**$480,584**	**$2,103,355**	**$2,583,939**

Panel B: Revenue and revenue growth through the end of the third anniversary

IPOs from June 1996–Dec. 2007	N=1,635	N=994	N=2,629
Pre-IPO Revenue	$124,840	$993,631	$1,118,471
Post-IPO Growth 3 Years after IPO	$193,991	$533,977	$727,9688
Percentage Growth	155%	54%	65%
Compound Annual Growth Rate	36.7%	15.4%	18.2%
Total 3 Years after IPO	**$318,831**	**$1,527,608**	**$1,846,439**

Panel C: Revenue and revenue growth through the end of the fifth anniversary

IPOs from June 1996–Dec. 2005	N=1,487	N=867	N=2,354
Pre-IPO Revenue	$107,301	$885,967	$993,268
Post-IPO Growth 5 years after IPO	$227,924	$623,598	$851,522
Percentage Growth	212%	70%	85%
Compound Annual Growth Rate	25.6%	11.2%	13.2%
Total 5 years after IPO	**$335,225**	**$1,509,565**	**$1,844,790**

Panel D: Revenue and revenue growth through the end of the tenth anniversary

IPOs from June 1996–Dec. 2000	N=1,245	N=612	N=1,857
Pre-IPO Revenue	$71,758	$465,694	$537,452
Post-IPO Growth 10 years after IPO	$212,048	$500,797	$712,845
Percentage Growth	296%	108%	133%
Compound Annual Growth Rate	14.7%	7.6%	8.8%
Total 10 years after IPO	**$283,806**	**$966,491**	**$1,250,297**

Pre-IPO Revenue is the twelve months of revenue prior to the IPO. All revenue is in terms of January 2011 purchasing power, using the CPI. Revenue in year +T is the revenue (usually from the 10-K report) T years after the year of the IPO. For example, year +3 is fiscal year 2004 for IPOs from 2001. If a company was delisted for bad reasons (e.g., failure to meet Nasdaq's net capital requirements and stopped filing financial statements), we assume that revenue fell to zero and stayed there. If a company is acquired, we assume that its inflation-adjusted revenue is frozen at the last available number.

At the time of the public offering, the emerging growth companies had far smaller revenues than the older, larger, other firms (see Figure 4). However, as we stated earlier, the EGCs' revenues grew more quickly and, by 2010, had become quite significant. As reported in Table 2, aggregate annual revenues earned in 2010 by all the EGCs that went public from June 1996 to December 2010 are more than $479 billion.

Figure 5 illustrates the contribution of each cohort to the 2010 totals for the EGCs. The aggregate revenue shown in each bar in Figure 5 increases over time as the cumulative number of IPOs increases, and as individual firms add sales after the IPO. The 1990s, not surprisingly, were a period of dramatically increasing aggregate revenues as many companies went public. From 2000–2003, annual revenue growth stagnated even as new, though small, cohorts entered the database. From 2004 through 2007, annual revenues again began to increase, only to stagnate again in 2008 prior to 2010. As was the case with employment, the 2004 cohort showed dramatic growth in revenues. The 1997 cohort also showed significant and relatively constant growth. Annual revenues for the 1996 cohort grew until 2001 and then stagnated.

Not surprisingly, the after-IPO revenue growth is affected by the number and success of the firms in the cohort and the overall economic situation (see Figure 6). As was the case with employment, the 1996 and 1997 cohorts initially performed extremely well, but then experienced a decline during the collapse of the Internet Bubble and the recession of the early 2000s. However, revenues for the 1997 cohort, which includes Amazon.com, recovered quickly and powerfully. While employment growth slowed down for the 1999 cohort, this cohort still shows substantial post-Internet Bubble revenue growth. But the stellar performer is the 2004 cohort, which overtook the larger and older 1998 cohort and, likely, in 2011 overtook the large 1999 cohort. In large measure, this is due to the remarkable performance of Google and Salesforce.com.

Figure 4. Revenue During the Year of the IPO by Emerging Growth Companies in Tan and Other Companies in Blue, Firms by Cohort Year in Millions of 2011 Dollars, 1996–2010

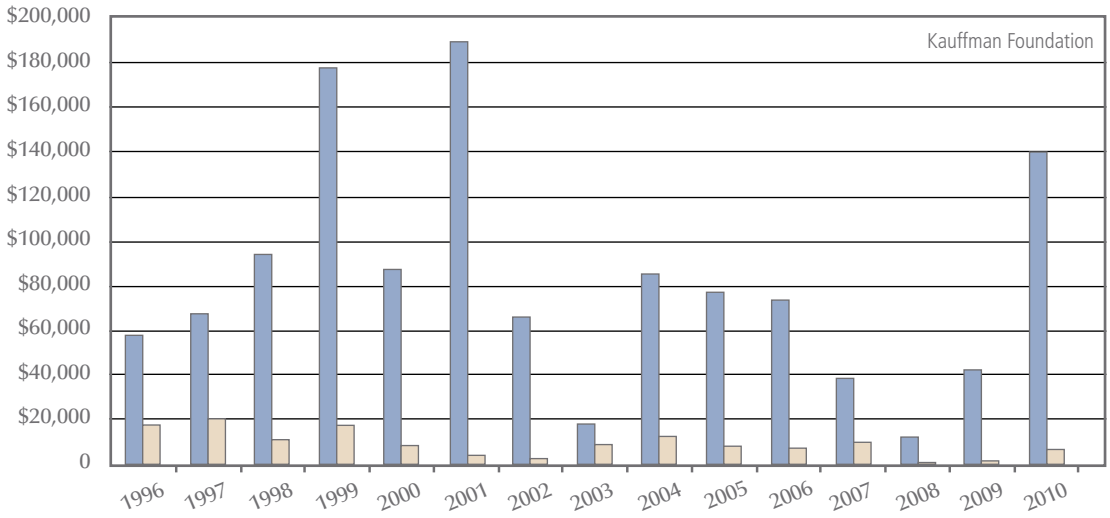
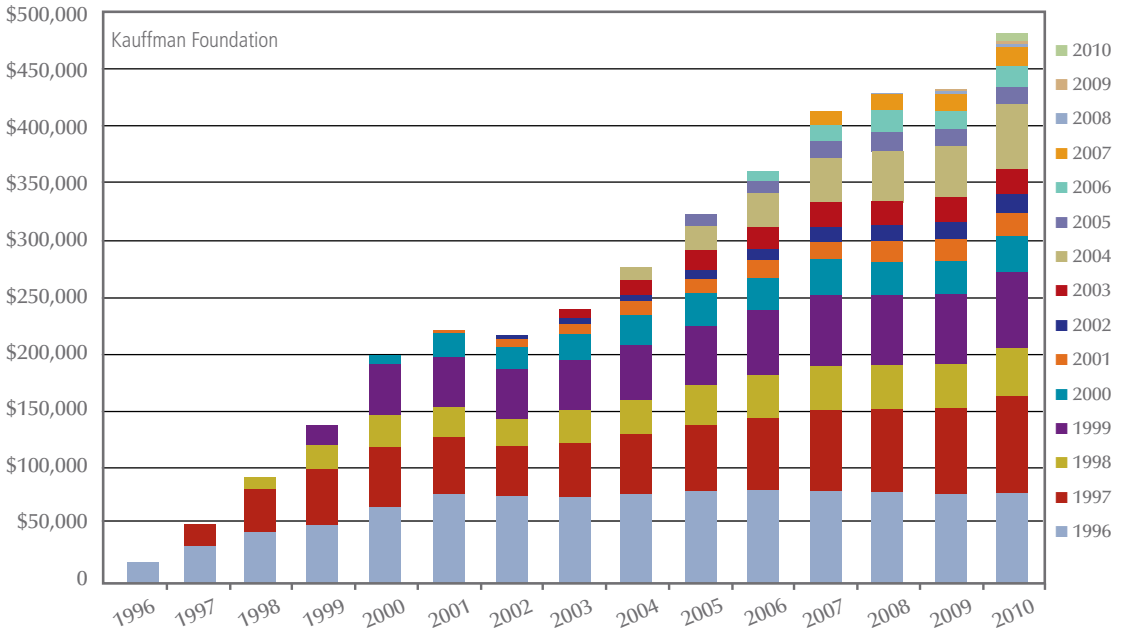
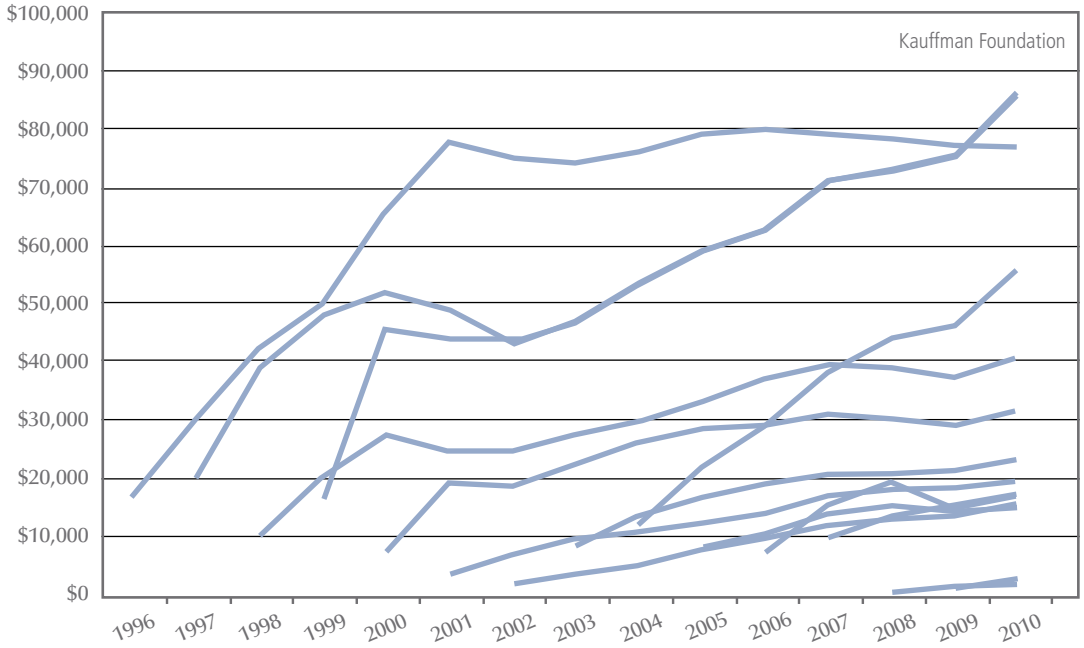


Figure 5. Annual Revenues for All Emerging Growth Company IPOs by Cohort in Millions of 2011 Dollars, 1996–2010



Explanation: The blue bar in 1996 is the 1996 revenues for all firms that had IPOs in 1996. In 1997, the blue bar represents the revenue of the 1996 cohort in 1997. The red bar represents the 1997 cohort's revenue in 1997, etc.

Figure 6. Revenue Reported for the Year of IPO and Revenue Growth Post-IPO by Cohort Year in Millions of 2011 Dollars, Emerging Growth Company IPOs, 1996–2010



IPO Firm Survival

The fate of firms making IPOs is of interest, as this is a measure of how many organizations undergoing an IPO survive and remain listed. Table 3 reports that, ten years after the IPO, only 29 percent of EGC IPOs were still in operation, despite the fact that this includes the excesses of the Internet Bubble years 1999 and 2000 and the concomitant crash. Fifty-five percent of these IPOs were acquired and 16 percent failed. For EGC IPOs from June 1996–December 2007, 23 percent were acquired within three years of the IPO. Using all IPOs from 1980–2009, Gao, Ritter, and Zhu (2012) report that 12 percent of IPOs are acquired within three years of the IPO, with the percentage higher during 1990–2009 than in the 1980s.[11]

The picture is somewhat different when one considers the status of EGCs by IPO cohort. Inspection of Table 4 shows that, if one examines the survival of IPO cohorts as of the end of 2010, more recent cohorts exhibit lower exit rates than older ones (this is to be expected, because with fewer years after the IPO, their cumulative risk of failure or acquisition is lower). More notable is the difference in survival between 2000, which was the year of the Internet Bubble collapse, and 2001. The 2001 cohort had dramatically higher survival rates (53 percent vs. 29 percent) than firms that undertook IPOs in earlier years. This suggests that the quality of firms increased substantially. The collapse of the Internet Bubble led to the demise of large numbers of recent IPO firms, suggesting that the quality of the firms may have declined during the Bubble (EGCs during 1999–2000 were younger than EGCs in other cohorts, and the survival rate of young firms is lower than that of older firms). It is important to note that we do not differentiate between normal acquisitions and distress acquisitions, i.e., acquisitions in which the firm was acquired at a price far lower than what the public paid at the IPO. In such cases, the public investors may have lost nearly all of their investment.

Table 3. Fate of all Emerging Growth Company IPOs: Three, Five, and Ten Years after the IPO and by 2010

Survival Period	Failed	Acquired	Operating	Total
3 years after IPO 1996–2007	96 5.9%	380 23.2%	1,159 70.9%	1,635
5 years after IPO 1996–2005	156 10.5%	532 35.8%	799 53.7%	1,487
10 years after IPO 1996–2000	200 16.1%	683 54.9%	362 29.1%	1,245
All firms by 2010 1996–2010	223 13.1%	869 51.1%	608 35.8%	1,700

Table 4. Fate of Emerging Growth IPO Firm by Cohort as of 2010

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total	
Failed	54	42	31	52	30	2	0	1	3	2	3	3	0	0	0	223	13.1%
Acquired	137	157	81	208	152	14	13	15	35	20	20	17	0	0	0	869	51.1%
Operating	48	73	34	73	73	18	10	16	55	38	39	66	9	14	42	608	35.8%
Total	239	272	146	333	255	34	23	32	93	60	62	86	9	14	42	1700	100%
Percent Operating	20.1%	26.8%	23.3%	21.9%	28.6%	52.9%	43.5%	50.0%	59.1%	63.3%	62.9%	76.7%	100%	100%	100%	35.8%	

11. Table 7 of "Where Have All the IPOs Gone?" by Gao, Ritter, and Zhu (2012) reports that 911 out of 7,443 IPOs during 1980–2009 were acquired within three years of the IPO. For the 50 percent of companies with less than $50 million ($2009) in pre-IPO annual sales, the merger rate was 6.0 percent in 1980–1989 and 14.4 percent thereafter. For the 50 percent of companies with more than $50 million in pre-IPO annual sales, the merger rate was 12.3 percent in 1980–1989 and 13.2 percent thereafter.

Despite the popular press' attention to the large number of failures of the dot-com era, acquisition (though as mentioned earlier many of these may have been distressed) is a far more likely outcome than outright failure for all cohorts. The fate of most Internet firms, as is the case of software and other information technology (IT) sectors, was acquisition. Table 5 reports that biomedical IPOs, one of the most knowledge- and technology-intensive sectors, have the highest survival and the lowest bankruptcy rate among all of our sectors. This is somewhat surprising because there have been repeated claims that there would be a shake-out in biotechnology firms—but, at least for publicly listed firms, the failure rates have been quite low. Interestingly, the highest failure rates are in manufacturing and retail. While not reported here due to space considerations, semiconductors, another extremely knowledge-intensive industry, also has excellent survival rates.

The effect of the Internet Bubble on three-year firm survival can best be seen at its height in the 1999 and 2000 cohorts, whose three-year survival rates declined precipitously, though most of the terminations were through acquisitions (Table 6). Here, it is significant to note that a number of the acquisitions were distress sales—and easily could have led to post-acquisition closure. Also, some of the continuing firms now are listed on the thinly traded penny-stock market and have very few employees. In many respects, these penny-stock firms have failed in all but name. Survival rates for the 1996 and 1997 cohorts were high, probably in part because raising money was easy. In the aftermath of the Bubble, with the exception of 2002, firm three-year survival rates were extraordinarily high. This may be an expression of investors only being willing to buy high-quality firms.

IPOs by Industry

Obviously, firms making IPOs come from many industries. Table 7 separates the IPOs by general industrial categories (see

Table 5. Firm Survival through 2010 in Percent by Industry, Emerging Growth Company IPOs

Class	Operating	M&A	Failed	Total
ICT	34.7%	53.0%	12.3%	398
Internet	24.9%	61.4%	13.7%	402
Biomedical	51.0%	42.9%	6.1%	247
Services	31.1%	57.6%	11.3%	177
Manufacturing	44.8%	36.2%	19.0%	116
Retail	33.0%	48.4%	18.7%	91
Other	39.8%	43.5%	16.7%	269
Total	**35.8%**	**51.1%**	**13.1%**	**1,700**

Table 6. Firm Status Three Years after Going Public, Emerging Growth Company IPOs

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Total
Failed	14	12	10	36	15	0	0	0	1	2	3	3	96
Percent	5.9	4.4	6.4	10.8	5.9	0	0	0	1.1	3.3	4.8	3.5	5.9
Acquired	40	60	35	106	66	6	7	5	16	11	11	17	380
Percent	16.7	22.1	24.0	31.8	25.9	17.6	30.4	15.6	17.2	18.3	17.7	19.8	23.2
Operating	185	200	101	191	174	28	16	27	76	47	48	66	1,159
Percent	77.4	73.5	69.2	57.4	68.2	82.4	69.6	84.4	81.7	78.3	77.4	76.7	70.9
Total	**239**	**272**	**146**	**333**	**255**	**34**	**23**	**32**	**93**	**60**	**62**	**86**	**1,635**

Table 7. Emerging Growth Company IPOs by Industry, 1996–2010

Class	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
Biomedical	34	28	8	8	30	4	3	7	38	20	26	27	2	2	10	247
ICT	59	72	40	70	73	11	3	5	13	9	11	22	1	3	6	398
Internet	8	13	21	200	91	1	4	4	13	10	9	13	1	7	7	402
Manufacturing	17	35	11	8	12	2	3	3	4	4	7	4	2	0	4	116
Other	53	51	29	26	35	10	2	9	14	12	6	10	2	2	8	269
Retail	25	24	17	6	4	0	2	1	3	3	0	3	0	0	3	91
Services	43	49	20	15	10	6	6	3	8	2	3	7	1	0	4	177
Total	**239**	**272**	**146**	**333**	**255**	**34**	**23**	**32**	**93**	**60**	**62**	**86**	**9**	**14**	**42**	**1,700**

Table A-3 for the SIC classifications aggregated into the seven large categories used in Table 5) and the year of the IPO. It has long been known that the number and types of firms making IPOs is cyclical. Unfortunately, though we cover a fifteen-year period, it is not quite a complete cycle. Nineteen ninety-six was already a fairly good year for IPOs and, after the collapse of the Internet Bubble, there was a slight recovery in the period from 2004–2008. This was followed by a total collapse in 2008–2009, with a slight recovery in 2010 that was followed by a relatively strong 2011 (data not included in this report). We divided the pure Internet firms from other information and communication technology firms. Obviously, 1999–2000 were the years of an avalanche of Internet offerings and a large number of ICT offerings. Interestingly, at the height of IPO Bubble in 1999 and 2000, most of the other sectors experienced a slowdown, though the services category firms may have reworked themselves to be "Internet" firms. Still, it is remarkable how all other categories were "crowded" out. However, with the collapse of the Bubble, IPOs in all categories collapsed, though the biomedical category recovered from 2004–2007, before being dragged down by the recent stock market collapse.

Historically, cyclicality has characterized U.S. stock markets' receptivity to new firm offerings. The difficulty with this downturn has been the length of the drought. For venture capitalists, this meant a search for new sectors that might be attractive to markets. One sector that has been much remarked upon was "Clean Technology." There have been some Cleantech IPOs; however, most of them have experienced poor post-IPO performance. More recently, in 2011, there have been a number of issuances of next-generation Internet firms. If this continues in 2012, the IPO market will have made a sustainable recovery.

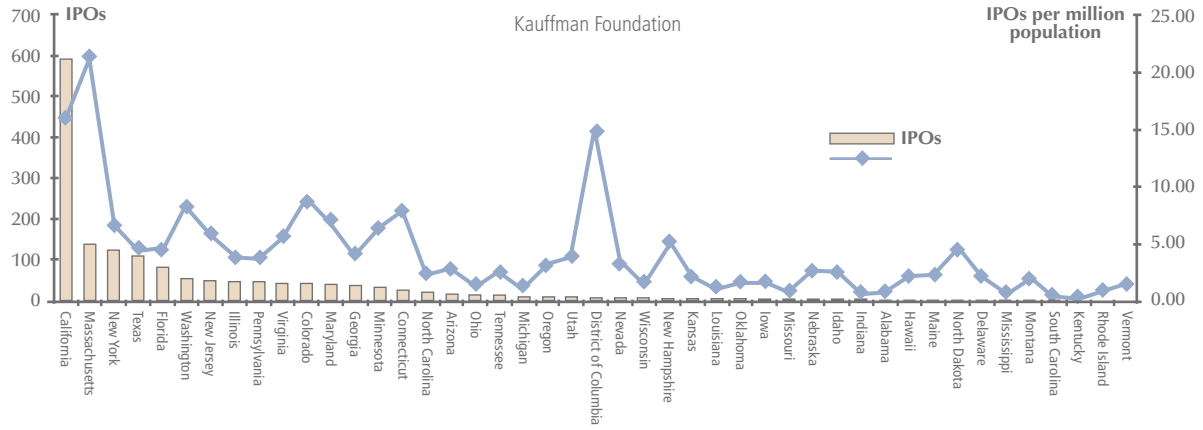
Locations of Firms Undertaking IPOs

The location of firms conducting IPOs in the United States is extremely concentrated in certain states (see Table 8) with more than 50 percent located in California, Massachusetts, New York, and Texas. California alone is home to 33 percent of the total. On a per-capita basis, Massachusetts had nearly twenty-two IPOs per million inhabitants[12], which was far superior to any other state. California and Washington, D.C., followed with approximately sixteen per million inhabitants. Washington, Colorado, Connecticut, Maryland, and Minnesota comprised a third group with between seven and nine IPOs per million inhabitants (see Figure 7).

What these results suggest is that there are marked differences between the states in terms of their ability to create new firms that grow sufficiently to be eligible for an IPO. In terms of being the home to IPO firms, jurisdictions normally considered to be business unfriendly, such as California, Massachusetts, and Washington, D.C., on a per-capita basis outperform states, such as Utah, Texas, and Florida, that are considered to be business-friendly. While not examined further in this report, there may be an inverse correlation between business friendliness as measured in most studies. Also, the commonly used argument about there being a "weather" effect does not appear to be strongly supported by this data.

12. This is the number of IPOs during the study period divided by the population in 2010.

Figure 7. Emerging Growth Company IPOs per State and per Million Inhabitants, 1996–2010



The location of venture capital-backed IPOs differs significantly from those not backed by VC. As Table 4 indicates, the San Francisco Bay Area garners almost 36 percent of all VC-backed IPOs, while being home to only 7 percent of the non-VC-backed IPOs. Oddly enough, California, as a whole, does quite poorly in terms of the ratio of non-VC-backed IPOs to VC-backed firms when compared to a number of other states. Within California, the Los Angeles area has more non-VC funded IPOs than those funded by VCs, as does Orange County. In many respects, this is so because industry funding patterns differ. For example, Texas has oil industry IPOs and those firms do not normally use VC as a source of funds.

Table 8. Headquarters Locations of Venture Capital and Non-Venture Capital-Financed Emerging Growth Company IPOs, 1996–2010

Region	VC-Backed	Percent of All VC-Backed	Non-VC-Backed	Percent of All Non-VC-Backed	Percent of All IPOs
California	452	46.4	141	19.4	34.9
San Francisco Bay Area*	348	35.7	50	6.9	23.4
Mountain View	30	3.1	4	0.6	2.0
San Francisco	34	3.5	5	0.7	2.3
San Jose	31	3.2	14	1.9	2.6
Sunnyvale	47	4.8	4	0.6	3.0
San Diego County	47	4.8	14	1.9	3.6
Los Angeles County	24	2.5	35	4.8	3.5
Orange County	15	1.5	26	3.6	2.4
Massachusetts	106	10.9	34	4.7	8.2
New York	45	4.6	82	11.3	7.5
New York City	33	3.4	50	6.9	4.9
Texas	39	4.0	74	10.2	6.6
Florida	24	2.5	60	8.3	4.9
All Others	309	31.7	334	46.1	37.8
Total	975	100.0	725	100.0	100.0

* Includes the counties of Santa Clara, San Mateo, San Francisco, Alameda, Contra Costa
Note: The percentages add up to more than 100 percent if one adds up all of the numbers in a column because the subsets of each state involve double-counting. Adding the percentages from each state gives 100 percent.

Remarkably, a few cities in the San Francisco Bay Area and, in particular, the region known as Silicon Valley, have had more IPOs than many states. To illustrate, the suburban city of Sunnyvale, with fifty-one IPOs, had more during this period than all but seven states. On a per-capita basis, this was 356 IPOs per million. Nearby Palo Alto, Calif., had 359 IPOs per million, but the smaller Mountain View had 446 IPOs per million. Outside the Silicon Valley region, Cambridge, Mass., led with 333 IPOs per million inhabitants. Interestingly, while Palo Alto and Cambridge are university towns, Mountain View and Sunnyvale are at the heart of Silicon Valley.

Venture Capital Involvement

Venture capital has been singled out as a critical funder of new firms. Among EGC IPOs, venture capitalists funded more than 50 percent of the entire population. However, their involvement (as measured by a venture capital representative on their board of directors at the time of the IPO) differed markedly by industrial sector (see Table 9). They were most concentrated in the high-technology industries and least concentrated in retail, where self-financing may be more feasible. It was surprising that the highest concentration of firms with venture capitalists on the board of directors was medical instruments—a field where

Table 9. Venture Capital Backing by Industry Class, Emerging Growth Company IPOs

Basic Class	Percent VC	Class Components	Initial Public Offerings		
			VC-Backed	Not VC-Backed	All Firms
Internet	77.6%		312	90	402
		Biotechnology	128	37	165
		Medical Instruments	70	12	82
Biomedical	80.2%		198	49	247
		Software	87	43	130
		Semiconductors	54	15	69
		Communications	42	10	52
		Telephone and Telegraph	28	20	48
		Computer Systems	27	14	41
		Computers	19	15	34
		Electronic Equipment	15	9	24
ICT	68.3%		272	126	398
		Retail Trade	19	41	60
		Wholesale Trade	6	25	31
Retail	27.5%		25	66	91
		Health Services	13	23	36
		Business Services	13	17	30
		Services	8	41	49
		Computer Services	9	13	22
		Computer Programming	18	22	40
Services	34.5%		61	116	177
		Manufactured Goods	13	47	60
		Machinery	5	22	27
		General Instruments	16	13	29
Manufacturing	27.5%		25	66	91
Other	24	2.5	60	8.3	4.9
Total	**57.4%**		**975**	**725**	**1,700**

one might have thought that boot-strapping would have been feasible. Conversely, there were firms in all sectors that did not have venture capitalists on their boards of directors.

Schumpeterian Innovation and IPOs

In certain respects, the employment for some firms that have gone public does not represent their true impact. In Figures 8 and 9, we illustrate this by presenting the employment and revenue growth of Amazon, eBay, and Google. These three firms are among the most successful of the Internet era and are examples of Schumpeterian innovation, whereby a firm or group of firms can contribute to the reorganization of entire economic sectors. Consider that eBay has become a massive marketplace with individuals and firms selling all manner of products globally. The full significance of this is difficult to gauge from either the employment or revenue, because eBay only captures a small fraction of the sales as revenue. Amazon, while different in that it has its own sales revenue, also has become an enormous marketplace through its Amazon Shops, which, though still a small source of overall revenue, are growing rapidly. Finally, there is Google, whose preponderance of revenues is from advertising, but whose impact on global information availability is difficult to overestimate. While these three firms are possibly the most noticeable, smaller firms such as Salesforce.com and Netflix have had significant impacts in their respective sectors.

So, while these firms have experienced remarkable growth, their impact on the United States and even the global economy is far greater. They exemplify the idea of Schumpeterian growth. In the case of Amazon, this growth is, in many respects, an example of creative destruction, as many brick-and-mortar retailers experienced a new type of competition that may have contributed to their demise. In the case of eBay, it is more difficult to identify if previous economic activities were destroyed. Finally, in the case of Google, it is certainly possible that media that previously had been supported by advertising have been weakened, but many of the services that Google provides were previously unavailable. These three firms illustrate the complicated nature of Schumpeterian creative destruction and how equity markets can provide the capital that helps fuel their enormous growth.

Figure 8. Firm Revenue Growth for Amazon, eBay, and Google in Millions of 2009 Dollars

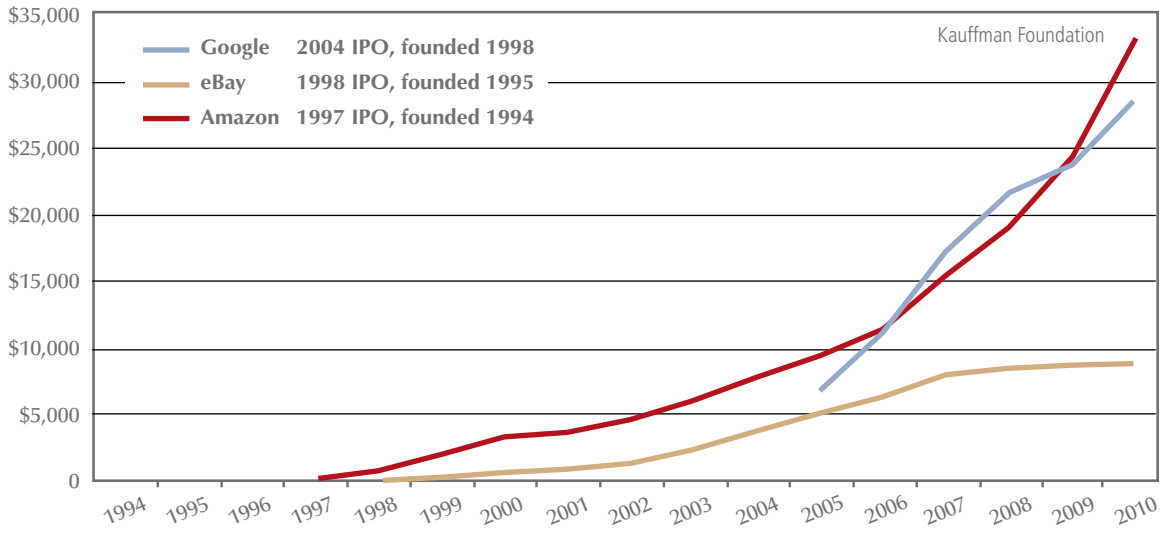
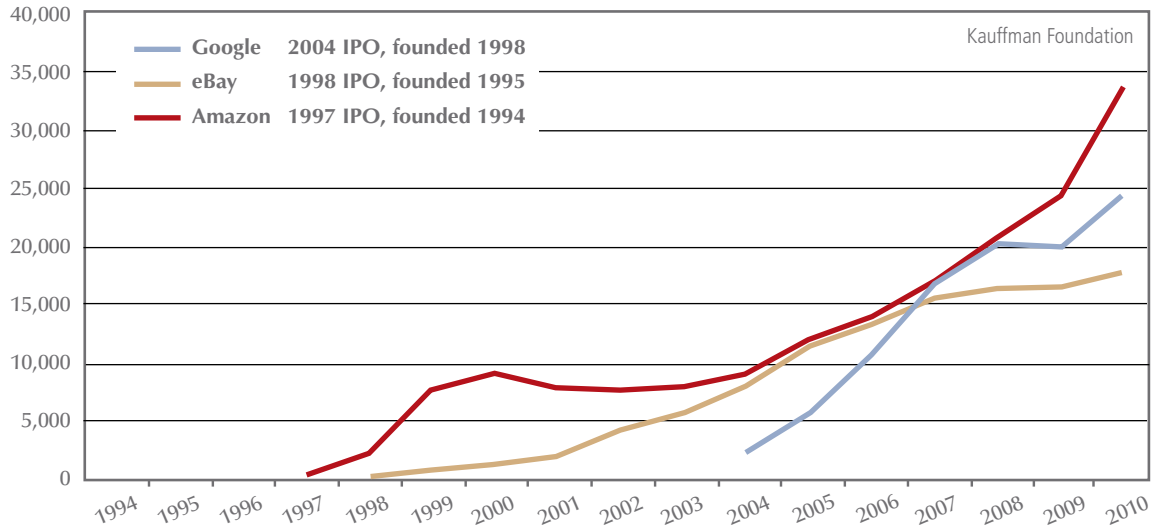
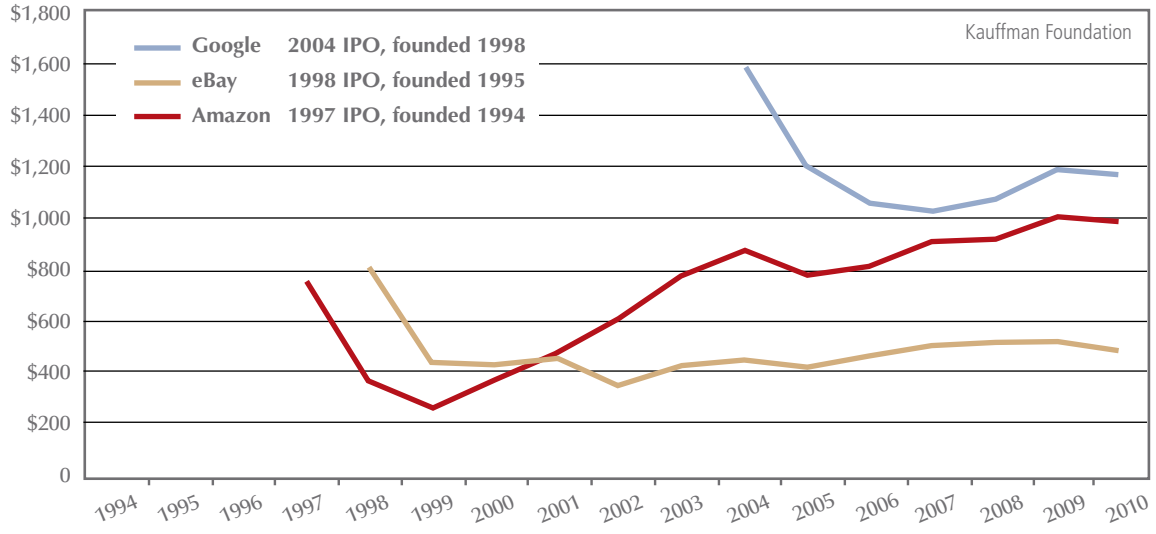


Figure 9. Firm Employment Growth for Amazon, eBay, and Google



Revenue per employee is an important indicator of the value created per employee. In Figure 10, we illustrate this pattern with three prominent companies, Amazon.com, eBay, and Google. What is evident is that, immediately after the IPO, revenue per employee dropped, which may be an outcome of the increased hiring with the influx of capital meant to fuel firm growth. In the case of these three firms, after the initial decline in revenues per employee, the revenues per employee began increasing. Amazon's performance was particularly impressive as it began with the poorest relative performance of the group, but has been overtaking the leader of these three firms, Google, in terms of revenue (see Figure 8).

Figure 10. Revenues per Employee by Year in Thousands of 2009 Dollars, 1997–2010



For purposes of comparison, Figure 11 shows median real revenue per employee over industry groups for the year of IPO and ten years after. For all operating firms, the median real revenue per employee ranges from just under $200,000 per employee to just under $250,000 per employee. This is well below the levels reached by Amazon and eBay in the years following their IPOs, and is very much below that achieved by Google. The biomedical firms had the lowest revenues per employee in the first years after their IPOs; however, after two years, revenues per employee increased quite significantly.

Proceeds

One reason that companies going public are able to rapidly add employees after the IPO is because they raise money in the IPO. The money that firms raise and invest would, presumably, be invested elsewhere in the economy if it did not go to the companies. In other words, there is no free lunch. In Table 10, we report that the average IPO during June 1996–December 2010 raised $189 million in dollars of 2011 purchasing power, with an average of $162 million going to the company. EGCs on average raised $83 million, and other companies raised $289 million.

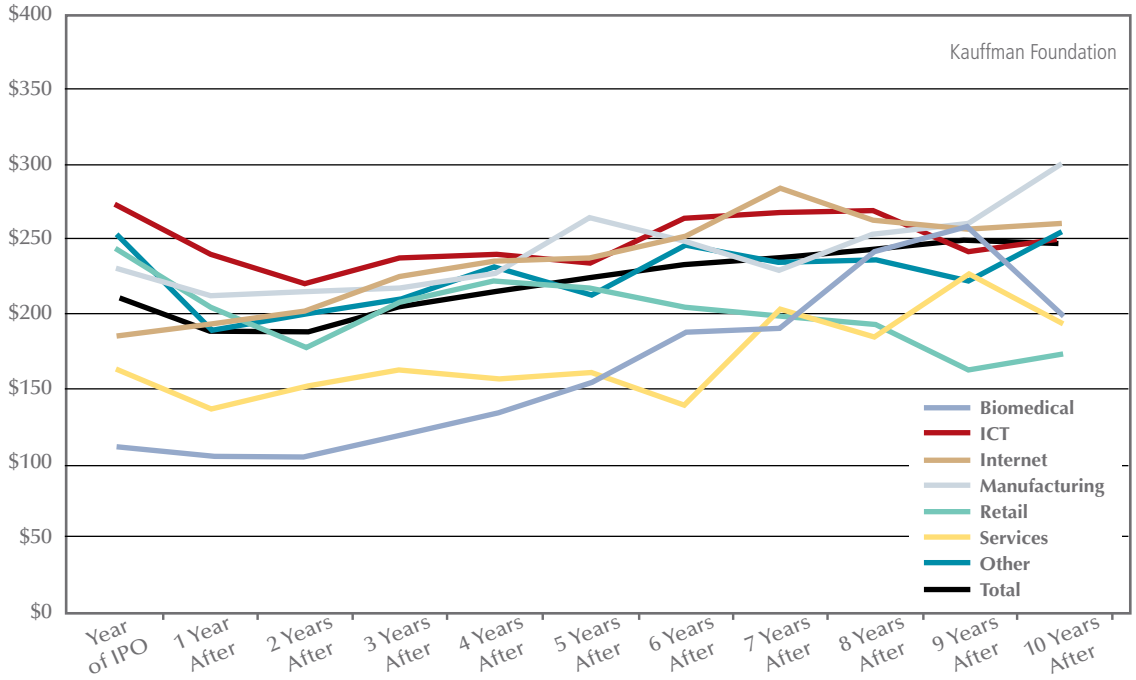
The $162 million raised per company, multiplied by the 2,766 IPOs during our sample period, amounts to $448 billion. In Table 1, we report that 2.272 million jobs have been added by these companies after the IPO. If we make the heroic assumption that these companies raise no other money after the IPO, this works out to $197,000 per job created or, in round numbers, $200,000 per job.

Table 10. Average Inflation-adjusted Proceeds from Newly Issued Shares, in Millions

IPOs from June 1996–Dec. 2010	EGCs N=1,700	Others N=1,066	All IPOs N=2,766
Average Total Proceeds	$89 mm	$348 mm	$189 mm
Average Percent Primary Shares	93%	83%	90%
Average Primary Proceeds	$83 mm	$289 mm	$162 mm

All proceeds numbers exclude over-allotment options and do not subtract the costs of raising capital, and are expressed in terms of January 2011 CPI purchasing power. Primary proceeds are the funds raised by the company from selling newly issued shares, and do not include proceeds raised by selling shareholders. The overall average primary proceeds of $162 million are calculated as the weighted average of the $83 million average for EGC IPOs and $289 million for other IPOs, and is thus less than 90 percent of the $189 million average total proceeds, due to the negative covariance of offer size and the percent of shares that are issued by the company.

Figure 11. Median Revenue per Employee in Thousands of 2009 Dollars from the Year of the IPO to Ten Years after the IPO, Emerging Growth Company IPOs



Acquisitions and Post-IPO Growth

One important consequence of an IPO is that the now-public firm has stock that can be used to purchase other firms. This is particularly the case for firms whose stock has a high valuation. Acquisitions create difficulties for our analysis of post-IPO firm growth. For example, as of December 2011, Google had acquired more than 150 firms. Unfortunately, there is no way to measure the contribution of acquisitions to a firm's total employment or revenue. For example, in 2010 Google purchased ITA Software for $700 million. According to press reports, ITA had somewhat less than 500 employees (Huang 2010). The number of these employees retained is unknown. Also, whether the employees acquired should be considered "jobs created" is a judgment. In the methodology section, this issue is discussed in greater detail. It is worth mentioning that nearly all of the acquisitions by the emerging growth companies are of other small young firms, so these may also be "new" jobs. However, this example illustrates how mechanical employment growth calculations may not be synonymous with "new jobs" created.

The fact that we do not distinguish between organic (internal) growth and acquisition-fueled growth results in the growth rate of aggregate employment for the IPO firms being higher than if we excluded acquisition-fueled growth. On the other hand, we do not adjust for reductions in employment due to divestures, and we assume that all firms that went bankrupt or delisted for distress reasons subsequently liquidated, and thus had their employment and revenues drop to zero. Thus, although we calculate that the 2,766 companies going public during June 1996–December 2010 added 2.272 million employees after the IPOs, a more accurate statement might be 2.272 million plus or minus 500,000 employees.

Conclusion

Two thousand seven hundred sixty-six domestic operating companies conducted IPOs from June 1996–December 2010 in the United States. They employed 5.061 million people at the time of going public and added 2.272 million employees after the IPO, a post-IPO average increase of 822 employees per firm. In dollars of 2011 purchasing power, their combined annual revenue grew from $1.32 trillion prior to the IPOs to $2.58 trillion in fiscal 2010.

The average company going public raised $162 million in inflation-adjusted proceeds, not including an additional $27 million raised by selling shareholders. Since the average company going public created 822 jobs after the IPO, on average every job required an investment of $200,000.

The 1,700 emerging growth companies (EGCs) that went public during this period have, by the end of fiscal 2010, been responsible for employing more than 1.6 million people and generating more than $480 billion in annual revenues, with most of the jobs created after the IPO. From this time period, 1,066 other IPOs, which are frequently of larger companies, are responsible for employing more than 5.6 million people and generating $2.1 trillion in annual revenue in 2010, although most of their employees were hired prior to going public.

When we restrict our analysis to the 1,857 companies that went public during June 1996–December 2000, their combined employment grew by 60 percent over the following decade, a compound annual growth rate of 4.8 percent. For the EGCs that went public during this period, their combined employment grew by 161 percent, a compound annual growth rate of 10.1 percent, even though many of them were Internet companies that crashed and burned. Inflation-adjusted revenue grew at an even faster pace, reflecting capital investments and productivity improvements that generate higher standards of living.

With respect to sources of funding prior to the IPO, 57 percent of EGC firms received venture capital funds, with VC funding concentrated in the information technology, communications, and biomedical industries, where it is present in approximately 75 percent of the IPOs. In other fields, such as manufacturing, retail, and services, it is far less prevalent.

In this report, we also calculate the survival rate of EGCs going public, and report that only 29 percent of these firms remain as independent public companies ten years after the IPO. Of those that do not survive, being acquired is much more common than going bankrupt.

We also examine the geographical distribution of the EGCs going public. There is an extraordinary concentration in California of firms undertaking IPOs. Despite California's absolute dominance, it was Massachusetts that had the highest

per-capita number of IPOs. While New York and Texas also had significant numbers of IPOs, on a per-inhabitant basis, they were not as impressive. In addition to the relative under-performance of Southern states and, with the exception of Colorado, the Rocky Mountain states, the industrial Midwestern states of Ohio, Michigan, Indiana, and Wisconsin had few IPOs, despite being the homes to elite universities. The most interesting exception to this observation is Minnesota, which is in the top nine states in terms of per-inhabitant IPOs. Within states, there are regions, especially the San Francisco Bay and Greater Boston areas, that exhibit extremely high concentrations of IPOs.

While aggregate statistics reporting revenue or employment increases provide valuable insights, there are particular firms in our population, such as Amazon, eBay, and Google, that are examples of Schumpeterian innovation, whereby a firm or group of firms can lead reorganizations of entire economic sectors. Their influence cannot be reduced to their internal performance. eBay has become a massive marketplace with individuals and firms selling all manner of products globally. Because eBay only captures a small fraction of the sales as revenue, its full significance cannot be gauged from either its employment or revenue numbers. Amazon has become one of the largest retailers in the world and has been a force for creative destruction that, again, cannot be fully captured in its employment and revenue numbers. Finally, there is Google, whose preponderance of revenues is from advertising, but whose impact on global information availability is difficult to overestimate. While these three firms are among the most noticeable, smaller firms such as Salesforce.com and Netflix also have had significant impacts in their respective sectors.

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