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A Historical Perspective on Tech Job Growth

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INTRODUCTION

General Motors reached 300,000 employees in 1941, 32 years after its 1909 founding. American Telephone & Telegraph hit the same milestone in 1926, 27 years after its 1899 absorption of the local Bell systems. And Walmart went over 300,000 associates in its 1991 fiscal year, its 21st year as a public company.

But, in 2016, Amazon became the fastest American company to reach 300,000 workers, hitting that mark in its 20th year as a public company. This figure, which does not include contractors or temporary workers, represents an average employment growth rate of roughly 30 percent per year. That figure was before Amazon's January 12, 2017, promise to add more than 100,000 full-time jobs in the U.S. over the next 18 months.

That's an amazing growth rate. But Amazon is not alone. In fact, tech giants such as Google, Apple, Facebook and Microsoft are adding jobs as fast or faster than the great job-producing companies of the past, like GM, AT&T, Walmart, IBM, GE, U.S. Steel, and Bethlehem Steel.

Consider this: 20 years after its 1892 founding, General Electric had 41,000 employees. Google beat that mark in 2012, only eight years after its 2004 initial public offering.

Or let's match Apple's job growth up against Bethlehem Steel's, which was the second largest steel maker and the biggest shipbuilder during World War II. Apple hit 116,000 full-time equivalent employees in 2016, 35 years after its fiscal year 1981 initial public offering. By comparison, Bethlehem Steel averaged roughly 95,000 employees on payroll in 1939, 35 years after its 1904 incorporation.[i] (Indeed, Bethlehem Steel could trace its lineage much further back to the founding of the Bethlehem Iron Company in 1861).

Even Facebook, the poster child for companies with high market values and low employment, looks better in historical context. Facebook had 15,724 employees in the third quarter of 2016, its fifth year as a public company. That doesn't seem like much, but General Motors only had 20,000 in its fifth year of being incorporated as GM. FedEx, one of the great job stories of all time, averaged 10,000 full-time equivalent employees in 1982, its fifth year as a public company (see Table 1).

TABLE 1: The Early History

	EMPLOYMENT, YEAR 5*
GOOGLE	20,222
GM	20,042
FACEBOOK	15,724
FEDEX	10,092
BETHLEHEM STEEL	8,615

**Based on IPO or corporate formation. See methodology. For Facebook, latest data available.*
Data: Annual reports, company histories.

What's going on here? We remember the giant corporate employers of the post-World War II period. But we fail to remember how they had generally been in existence for many decades before they reached that mammoth size. And just like it takes many years for an oak tree to grow from an acorn, it turns out that employment growth simply takes time.

We also forget that today's tech firms are genuine startups. By comparison, most of the big job producers of the past started as mergers or roll-ups of companies that had existed for years or decades before.

When we compare today's tech leaders with the employment leaders of the past at a similar stage of development, it turns out that the job creation performance of the tech sector looks quite good. Table 2 looks at employment in year 20 for many of the most important companies of the past 100 years (see the methodology section for an explanation of how the start date was identified).

TABLE 2: How Tech Companies Compare to the Big Job Creators of the Past

COMPANY	START DATE*	YEAR 1	YEAR 20**	
AMAZON	1997	614	306,800	
WALMART	1971	1,500	271,000	
GENERAL MOTORS	1909	14,250	208,981	
AT&T	1899	25,741	199,914	
U.S. STEEL	1901	168,000	191,700	
APPLE	1997	8,437	116,000	
FEDEX	1978	3,224	107,827	
GOOGLE	2004	3,021	69,953	YEAR 13
BETHLEHEM STEEL	1904	9,461	62,350	
MICROSOFT	1985	998	57,000	
GENERAL ELECTRIC	1892	NA	41,300	
IBM	1924	3,384	21,251	
FACEBOOK	2012	4,619	15,724	YEAR 5

Data: Annual reports, company histories.
**Based on IPO or corporate formation. See methodology.*
***Includes first year. For Apple, Google, Amazon, Facebook, latest data available.*

To be complete, Table 3 shows the current employment of top U.S. tech and telecom companies. These figures will be updated as companies report their 2016 results.

TABLE 3: Today's Big Tech/Telecom Employers

COMPANY	EMPLOYMENT*
IBM	377,757
AMAZON	306,800
AT&T (NEW)	273,140
HEWLETT PACKARD ENTERPRISE	195,000
VERIZON	162,000
COMCAST	153,000
ORACLE	136,000
APPLE	116,000
MICROSOFT	114,000
INTEL	107,300
CISCO	73,700
GOOGLE	69,953
HP	49,000
QUALCOMM	30,500
SPRINT	30,000
FACEBOOK	15,724

** Latest data available as of January 11, 2017.*
Data: Annual and quarterly reports

BACKGROUND

Let's think back on the auto industry. Henry Ford unleashed his disruptive innovation on the automobile market in 1908. The Model T was a miracle of standardization and cost cutting, enabling Ford to make each vehicle more efficiently and quickly than his competitors.

At the same time, William Durant, an entrepreneur and salesman in Flint, Michigan, was creating General Motors. Unlike Ford, however, Durant did not start from scratch[ii] Durant rolled up 13 car companies and 10 parts-and-accessories manufacturers into one huge multi-brand manufacturer, employing 14,250 employees in 1909, GM's first year of existence. This number quickly grew. By 1929, General Motors had more than 233,000 workers in the United States and other countries, including assembly plants located in London, Copenhagen, Stockholm, Warsaw, Antwerp, Berlin, Buenos Aires, Sao Paulo, Osaka, Bombay, Wellington (New Zealand), Port Elizabeth (South Africa), and multiple cities in Australia.[iii]

But, despite the company's global reach—or perhaps because of it—General Motors became the largest private sector employer in the United States. In 1955, for example, GM employed more than 400,000 hourly workers in the United States alone, with a total of 624,000 workers worldwide.[iv] In 1979, GM's U.S. employment hit its peak at over 600,000, with more than 800,000 employees worldwide.[v]

Clearly, no U.S. tech firm today can compare in employment to GM at its peak. But, in 1979, GM had been around for seven decades, going through two world wars, a Great Depression, and several decades of American prosperity. By comparison, companies such as Google and Amazon are far younger.

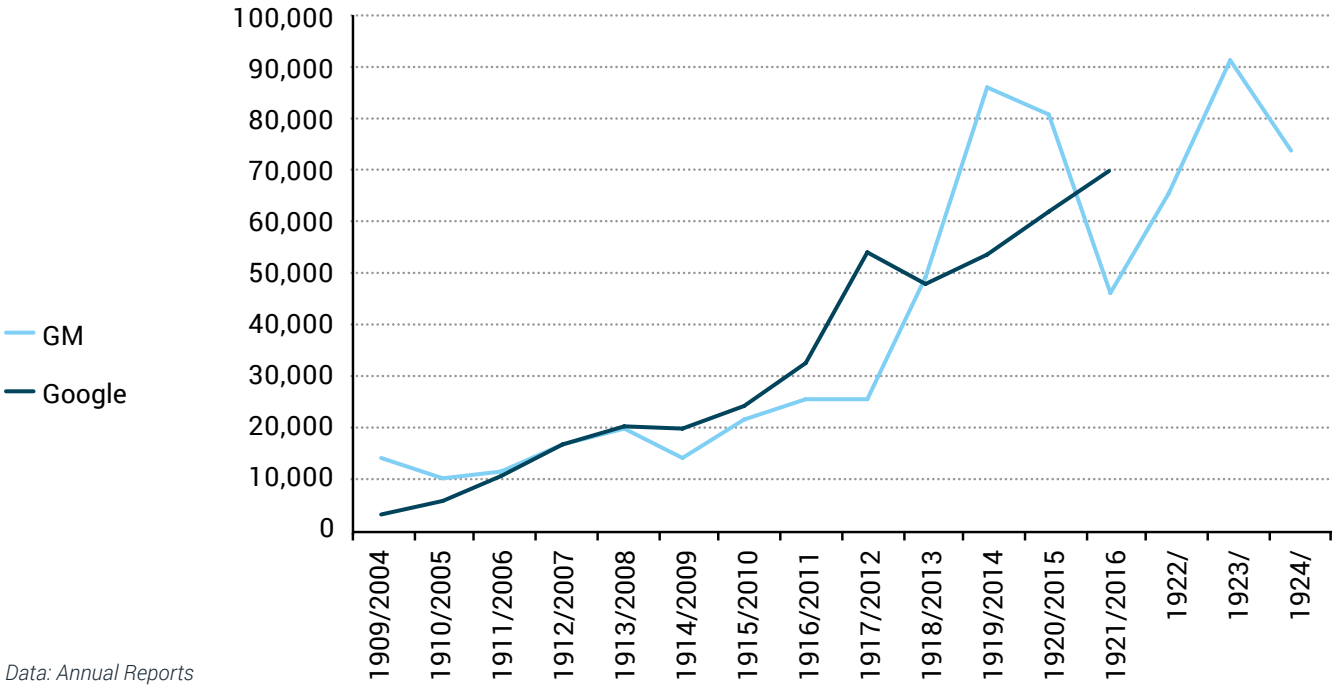
Similarly, Sam Walton opened his first Walmart in 1962, but he had been running discount stores since 1945. And when Walmart went public in 1970 (FY 1971), he had 32 stores and decades of experience. U.S. Steel was formed in 1901 as a giant roll-up of existing steel companies, including the Carnegie Steel Company, which had been in operation since 1872. As a result, U.S. Steel started with 168,000 employees and a huge share of the domestic steel market.

General Electric was founded in 1892 as a merger of the Edison General Electric Company and the Thomson-Houston Electric Company.[vi] American Telephone and Telegraph (the original incarnation) had an even more complicated corporate history. It was originally incorporated in 1885 as the long-distance subsidiary of the Bell System. But, for various reasons, in 1899 the assets of the local exchanges were transferred into AT&T, and the subsidiary became the parent company.

COMPARISONS

How do the employment trajectories of large tech firms such as Google and Amazon compare to the early years of GM and other big job creators? Take a look at Figure 1, which shows the actual employment figures for the first 13 years of Google as a public company, starting with 2004, and the first 15 years of corporate existence for General Motors, starting with 1909 (remember that the Google data only goes through the third quarter of 2016).

FIGURE 1: GM Jobs vs. Google Jobs: The First 13 Years

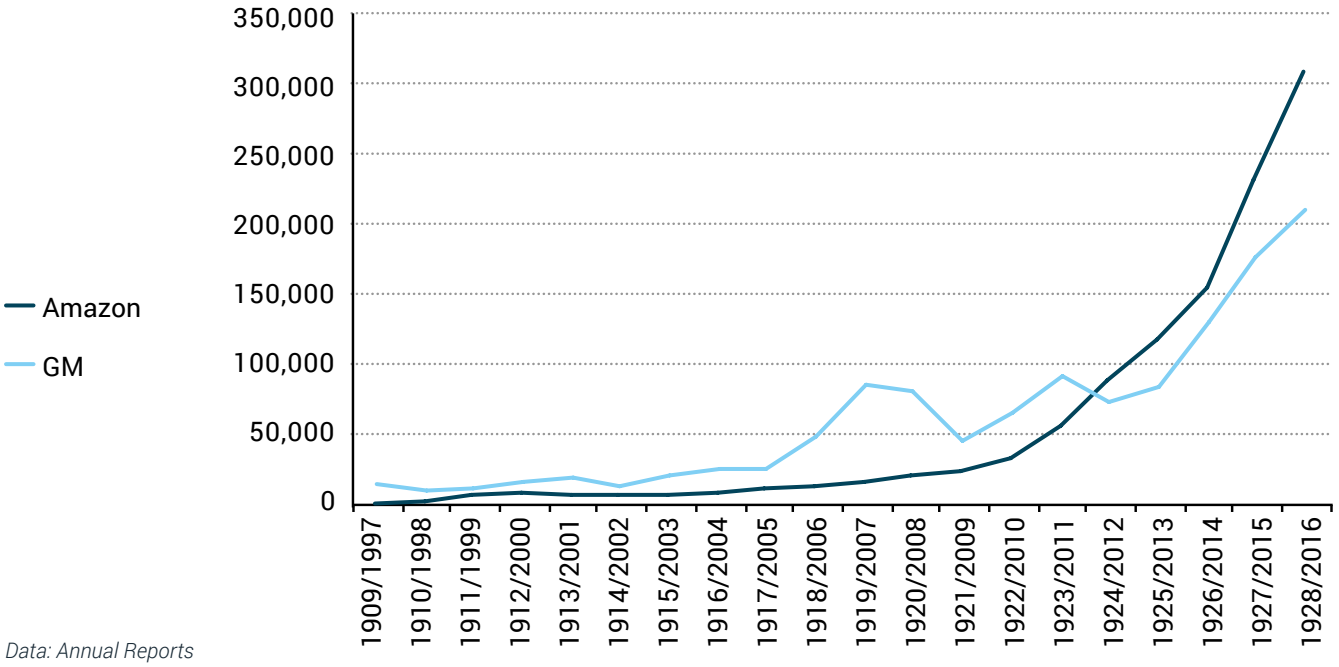


Data: Annual Reports

We can see that Google is almost exactly paralleling GM's early employment growth, with far fewer ups and downs. Note also that GM had an extensive global presence almost from the beginning, so a substantial share of its employment was overseas.

We can make a similar comparison between GM and Amazon (Figure 2).

FIGURE 2: GM Jobs vs. Amazon Jobs: The First 20 Years

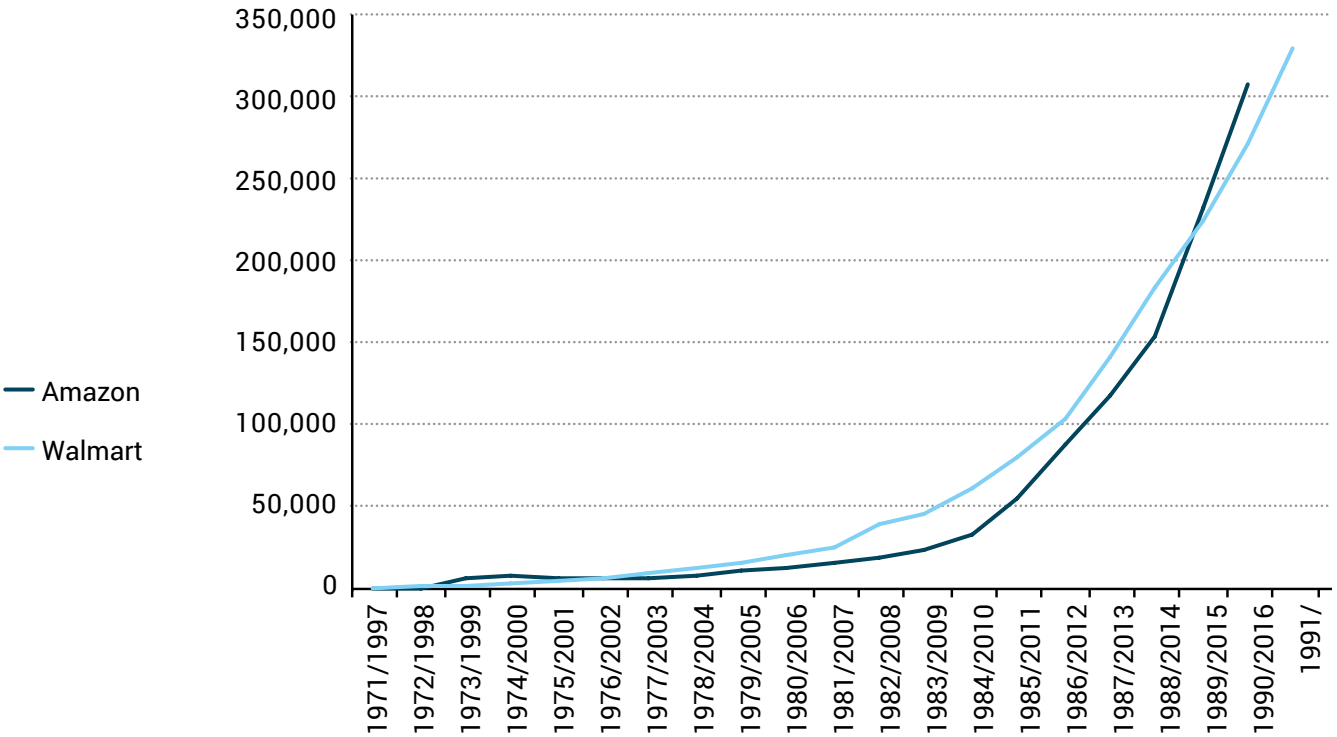


Data: Annual Reports

We can see that Amazon's employment for its first 20 years parallels GM's, before actually jumping ahead.

Now let's do a comparison between Walmart and Amazon. Walmart, of course, is currently the largest, by employment, publicly traded corporation in the world, with 2.4 million associates. But we want to compare Amazon's employment trajectory with the first two decades of Walmart after it went public in FY 1971 (Figure 3).

FIGURE 3: Walmart Jobs vs. Amazon Jobs: The First 20 Years



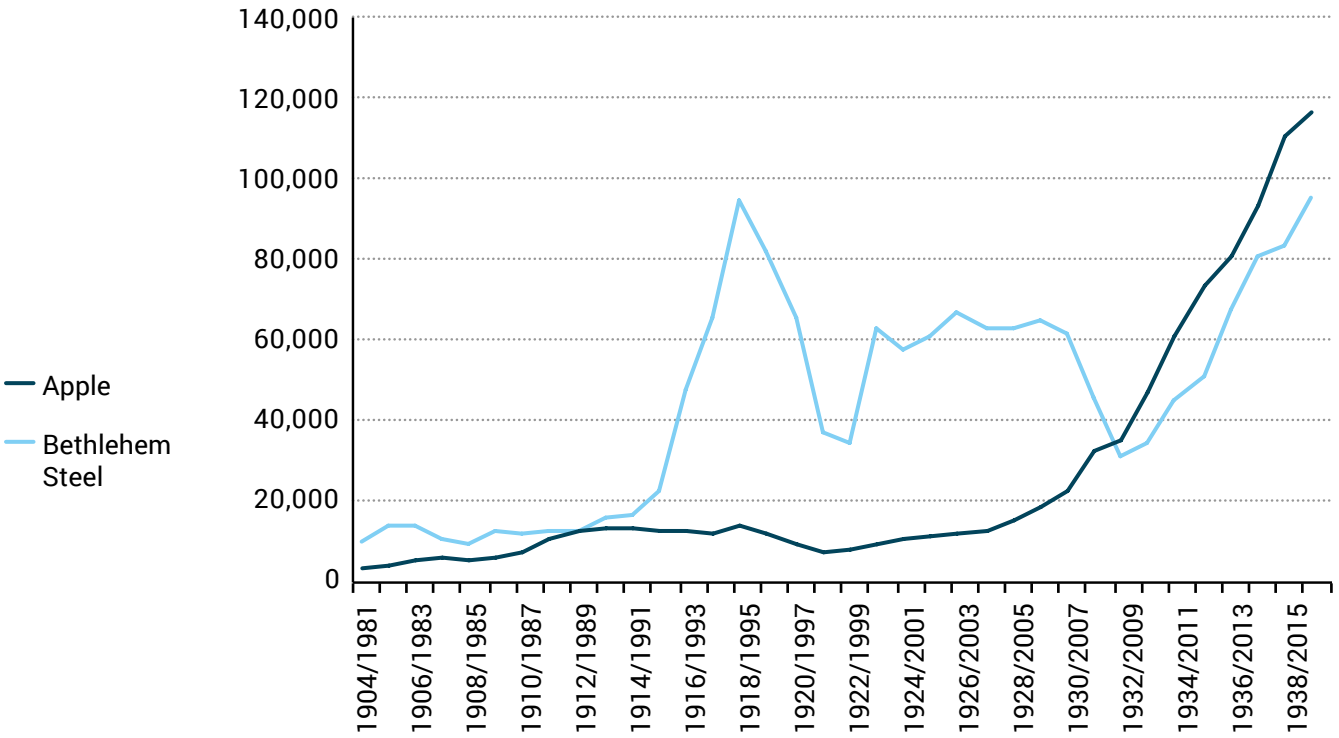
Data: Annual Reports

What's striking is just how similar the employment trajectories are between Walmart and Amazon.

Now let's consider Apple, which originally went public in 1980 (FY 1981). Apple really had two starting points—FY 1981, and then FY 1997, when Apple bought Next Software and Steve Jobs returned to the company he founded. In Table 2 above, we used 1997 for the start date.

But, as we also noted at the beginning of the paper, we can compare Apple to Bethlehem Steel, using the earlier start date of FY 1981. That's shown in Figure 4, below.

FIGURE 4: Bethlehem Steel vs. Apple: The First 35 Years of Employment



Data: Annual Reports

Note that Bethlehem changed its method of calculating employment several times over this period.

Finally, let's do a comparison of IBM and Microsoft, two companies that have a long history together. IBM, which had more than 378,000 workers globally as of 2015, is one of the largest corporate employers in the world. By comparison, Microsoft, with 114,000 employees, is a much smaller job creator.

But that comparison fails to take into account the difference in the age of the two firms. IBM started in 1911 as the Computing-Tabulating-Recording Company (C-T-R), which was a merger of the Tabulating Machine Company with the International Time Recording Company and the Computing Scale Company of America, both of which had been started a decade earlier.[vii] The new company had 1,300 employees and offices and plants in New York, Michigan, Washington, D.C., and Canada.[viii] In 1924, more than 90 years ago, IBM changed its name from the Computing-Tabulating-Recording Company (C-T-R) and became International Business Machines. By contrast, it's been only 31 years since Microsoft's 1985 IPO.

In fact, Microsoft's job growth over its three decades as a public company far exceeds IBM's first three decades of job growth. Since 1985, Microsoft averaged a 16.5 percent annual employment growth rate. By contrast, IBM grew from roughly 3000 to 56,000 workers in the 31-year stretch from 1924 to 1955. That's a strong 9.5 percent annual employment growth rate, but still slower than Microsoft's.[ix] We note that Microsoft's domestic employment of 63,000 in 2016 substantially exceeds IBM's 1955 domestic employment of 39,000.

PRELIMINARY DISCUSSION OF JOB QUALITY AND WAGES

We currently have underway an analysis of the quality and wages of tech/telecom jobs, including upstream and downstream jobs. But, for the purposes of this paper, we want to show some current data on average hourly wages for selected tech and telecom industries, both for all employees and for productivity and nonsupervisory workers (Table 4).

TABLE 4: How Tech Companies Compare to the Big Job Creators of the Past

ALL WORKERS	AVERAGE HOURLY WAGE
SOFTWARE PUBLISHERS	56.64
COMPUTER SYSTEMS DESIGN AND RELATED SERVICES	45.18
DATA PROCESSING, HOSTING AND RELATED SERVICES	38.40
TELECOMMUNICATIONS	32.16
ELECTRONIC SHOPPING AND ELECTRONIC AUCTIONS	30.85
TOTAL PRIVATE	25.66

PRODUCTION AND NONSUPERVISORY WORKERS	AVERAGE HOURLY WAGE
SOFTWARE PUBLISHERS	45.46
COMPUTER SYSTEMS DESIGN AND RELATED SERVICES	41.27
DATA PROCESSING, HOSTING AND RELATED SERVICES	30.54
TELECOMMUNICATIONS	28.08
ELECTRONIC SHOPPING AND ELECTRONIC AUCTIONS	25.57
TOTAL PRIVATE	21.55

Data: Bureau of Labor Statistics

We note that average hourly wages for the telecom and ecommerce industries are roughly 20 to 30 percent above the average for the economy as a whole, both for all employees and for production and nonsupervisory workers. That puts those industries solidly into the rank of "middle-class" jobs, though the concept of "middle-class" itself requires more analysis and examination. Obviously, we don't have data on individual companies, but the aggregate figures suggest that companies such as AT&T, Amazon, and Comcast are contributing to mid-skill jobs that are open to a wide range of Americans. Indeed, companies such as AT&T are investing in their large existing workforce to increase their skills levels and maintain them at middle-class levels.

Software publishers, computer programming firms, and Internet companies (not shown) typically have much higher average wages.

In that case we need a close examination of the upstream and downstream job creation to understand the full range of jobs generated by the tech and telecom sectors. In earlier work, we have already shown that the App Economy is generating in excess of a million jobs for non-tech workers. We will further expand those results in the next paper.

CONCLUSION

Today's big tech companies are following a similar employment trajectory to the big job creators of the past. In the next paper we will analyze the mix of jobs created by the tech sector, and the nature of the upstream and downstream spillover effects.

Appendix: Methodology

Our goal is to compare the employment growth among firms from different eras. The current tech firms are greenfield startups, in the sense that a new company was started from scratch and went public relatively soon afterward. For these companies the fiscal year of the IPO is the logical starting point.

By comparison, most of the earlier big job creators—such as U.S. Steel, General Motors, and General Electric—were generally formed by merging smaller, existing companies. For these companies, we picked the date of corporate formation that the company itself would pick as its beginning date. For AT&T and Bethlehem Steel, we picked the date of corporate restructuring into its "final" form.

The two exceptions are IBM and Apple. As noted earlier, Apple has two natural start dates: FY 1981 for its IPO, and FY 1997 for the return of Steve Jobs and the absorption of Next Software. IBM has two logical start dates: 1911, when C-T-R was formed, and 1924, when the company first took the name IBM. We chose the second one, even though IBM itself celebrated its centennial in 2011.

We used employment data from annual reports when available, or corporate histories. In some cases, numbers from different sources or different years of annual reports were inconsistent.

References

i This number is for U.S. workers, but Bethlehem had no plants or shipbuilding facilities outside of the country.

ii http://www.mackinac.org/article.aspx?ID=651

iii 1929 GM annual report

iv 1955 GM annual report

v http://www.mlive.com/business/index.ssf/2008/09/a_brief_history_of_general_mot.html

vi https://www.ge.com/about-us/fact-sheet

vii https://www-03.ibm.com/ibm/history/history/decade_1900.html

viii https://www-03.ibm.com/ibm/history/history/decade_1910.html

ix We could start the comparison at 1911 for IBM, when C-T-R was created out of three smaller companies, and 1975.

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The Progressive Policy Institute is a catalyst for policy innovation and political reform based in Washington, D.C. Its mission is to create radically pragmatic ideas for moving America beyond ideological and partisan deadlock.

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