

The Evolution of US Industry & Manufacturing

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Abstract

US industries have evolved as offshore supply chains have afforded economic advantages in this new era of globalization. While some industry sectors are suffering losses, industry sectors such as Chemical and Finance have experienced revenue growth in recent years. In order to examine the recent evolution of US manufacturing, this study tracks trends for the last two decades by following the performance of Fortune 1000 companies aggregated into process-specific sectors. A forecast based upon these trends is postulated so that the United States of America may adapt as a nation and maintain an edge in the global marketplace. Overall, the analysis provides a bigger picture view of US manufacturing and how it is growing to meet changing demands that will continue to diverge from the model of 20th century production.

The decrease in big “M” manufacturing throughout the United States over the past several decades is actually not as it seems. A substantial contribution to the seeming loss of manufacturing jobs involved a shift to other industries where individuals performing what had previously been categorized as a ‘manufacturing’ task was re-labeled as ‘service.’ Changes of this nature have appreciable impact on the classifications and data of the Bureau of Labor Statistics, these factors are explored. The impact of the current economic crisis and very definite loss of jobs is also addressed, and the impact on each industry analyzed. The trends disclosed will be compared with previously published data.

Introduction

This paper is divided into two sections which address similar issues in different contexts. In the first chapter we primarily address industries across the U.S. as well as the broad scope of manufacturing globally. In the second chapter we consider Fortune 1000 companies involved in manufacturing.

Much of the research for the first chapter of this project was done through the use of two primary sources. The first of the two sources was the Department of Commerce⁵ and the second was the Bureau of Labor Statistics⁴. The paper brings to life many eye-opening statistics about the current job market as well as exploring the last decade of job shifts. Attempts are made to remove the current market collapse from much of the information. A major objective is to prove that American manufacturing while shrinking is not less productive. We have seen trends and shifts through American labor throughout our growth as a country. We saw the “death” of steel throughout the country no more than twenty years ago. The country emerged from the seeming

crisis and still has the largest steel producer in the world, a company by the name of Nucor. Just because some companies are faltering does not mean others are not emerging. Industries are cyclical and manufacturing will never go away, it will merely re-invent itself so that it can compete with the pressures presented globally. In order to do that as a country, the stigma cannot be that engineering is a dying profession, but rather we need more engineers to improve lead times, quality, and safety of the product. These are the areas companies must look towards if they want a sustainable company and product. Price is no longer a viable option for Americans to compete. The presence of Unions and labor laws make it impossible for U.S. companies compete with pricing from countries like China and India.

To introduce that concept, *Figure 1* will show the beginning of the study. To show one of the many interesting features that the table shows is that there are less people in manufacturing with more skill. The table clearly indicated a decrease in what the government labels as manufacturing. What the tables do not indicate is the growth in the services and tech sector. Also left out is the fact that manufacturing employees though fewer are being paid 30% more than they were just ten years ago. So, we cannot necessarily take these tables to show merely the immense decline in manufacturing numbers but also the staggering increase in efficiency as well.

Throughout the second chapter we take a close look at how US industry has changed over the past two decades by considering Fortune 1000 industry data. Fortune data is used because it represents the nation's largest companies that lead the way in industry revenues. By observing progression in our nation's top companies we can predict where the rest of country is headed. Performing a logical aggregation of industries and sectors make it possible to study trends in recent years. Taking each specific industry's revenue and employment data, then aggregating into relevant sectors allows us to compare more generalized sector results to specific industry result so we can see how industry trends affect each other and the overall average. The popular notion that US manufacturing is dying out is seriously flawed. We will consider the past, present, and future of US manufacturing industries in order to best understand how our nation's production-focused economy has become what it is today.

Chapter 1:

Present Status

The country has seen a great shift in areas of employment over the past ten years. In most situations we see tabloids and media explanation about the death of manufacturing throughout the country. But American ads on television and an innate fear about entering the manufacturing sector is very present in our country's media depictions of manufacturing. This is deceiving for several reasons, left out of the argument is the number of engineers, and would-be manufacturing sector employees that have gone on to work for technology and service based companies. The data in *Figure 2* provides information about goods-producing employees in this country over the last decade.

This information should not come as a shock to anyone in the country. We have outsourced at a frightening rate over the last decade and this can be seen in the trade deficit

statistics. Listed in *Figure 3* are the statistics for the trade deficit with China alone. These statistics have increased every year (with the exception being from 2000 to 2001 where it fell \$60 million) from 1985 to the present state. So, politicians and news stations to begin talk about the demise in United States manufacturing at this point is absurd. Labor and work have been outsourced for well over two decades. Ultimately, the fact is that outsourcing does not mean that manufacturing is finished in this country. Certainly statistics like these are alarming and should be taken note of but this has been happening for the last 25 years.

Keith Gardiner's paper entitled "Manufacturing: The Future"¹ featured information taken from the United States Census Bureau. It shows the employment statistics by size of company in this country. What the data in *Figure 4* provides us with is the concept that large, main-stream, big name brand companies are a way of the past for the United States. They will have a presence here, but they are unlikely to do their manufacturing here. This is quite clear from the data which shows that the number of companies left in the United States with over 5000 people employed at them is down to just 1,795. More eye-opening is the fact that just two short years ago there were 913 companies with over 10,000 people and now that number has dwindled to 890. This data confirms the fact that companies have centralized their focus and "cut the fat" out of their operations.

This shift is something that can be expected with such a large amount of manufacturing work going overseas. What the data does not indicate is that the total number employed over the past couple years has not changed drastically at all. Rather, more people are self employed or employed to smaller more efficient organizations.

Method of Approach

To accurately assess whether or not the United States is actually due for serious trouble by the loss of "manufacturing" jobs one of the more important things to investigate is if it has caused a decrease in the private sector of this country. The answer to that question is NO. The data in *Figure 5* provides validation that in fact the country's private sector has grown steadily over the last ten years with the exception, of course, being the recent market collapse. Still the numbers are higher than they were ten years ago.

The reason this is important and what this will prove is that "manufacturing" employees are not lost from our workforce but rather re-distributed. Also, had these numbers faltered we would see a larger increase in government employment than we already do. To take a quote from the Bureau of Labor Statistics,

"About 37 percent of engineering jobs were found in manufacturing industries and another 28 percent were in the professional, scientific, and technical services sector, primarily in architectural, engineering, and related services. Many engineers also worked in the construction, telecommunications, and wholesale trade industries."⁴

What this quote is telling us is that of the 1.5 million practicing engineers in the country in 2006 only 37 percent of them were categorized as having "manufacturing jobs." Obviously not all of the engineers were in fact in manufacturing jobs, but the peculiar thing to note in the

quote is that the next 28% were in scientific or technical services. This is another 400,000 people that in 1999 may have been labeled by the government standards as “manufacturing” employees but now rank in the service and science fields. This information is most important because we have not seen a rapid decline in employment in the country or a massive increase in government employees. Similar to ten years ago, about fifteen to twenty percent of the employed population remains employed by the government.

If in fact the private sector was decreasing in size and the government growing rapidly (spending not included, only actual government employees), then the decline in manufacturing numbers would prove to be devastating. But, upon finding that that there are currently 16.8% of the employed population working for the government juxtaposed to that number ten years ago of 15.75% it is not alarming enough to account for the “missing” manufacturing jobs.

The American Shift

In this section of the paper are several first-hand accounts of how American manufacturing has survived and will survive in the US. There are three major factors that will keep a company from outsourcing. The first of the three is lead times, the second is quality, and the third is reliability. Most American consumers do not want to go abroad for the product but with increasing frequency we see suppliers lose customers to a foreign supplier on what the supplier will describe as undercutting. To avoid this drastic fate the American supplier must lean on the aforementioned three tactics, competing for price alone is not feasible. A company located in Perkasi, Pennsylvania by the name of Advanced Plastix, that makes high-end custom dies for both the electronic and pharmaceutical companies and has constantly been outbid by foreign suppliers but gets repeat orders with ease because they have adopted these tactics. They work closely with the customer, customizing orders for them and ensuring their quality in a faster time than foreign nations ever could. They have been able to grow their company in both employee numbers and output per year despite the allegedly bleak outlook for the continued production of goods in this country.

Chapter 2:

Present Status

Entering the year 2009, America looks to its waning manufacturing industries as a sign of impending economic doom. The country has reached a turning point where the failure in risk management across many industries has forced a necessary reaction. Coupled with outsourcing and the rise of manufacturing overseas, it has become the popular belief that US industry is headed downhill as competing nations are able to produce more efficiently. The obvious questions raised regard how true this belief really is; where the deficiencies are; and how we can improve.

The first step in developing an answer to these questions is to firmly establish the present status of US industry. Fortune has not yet published data for 2008, so it is difficult to consider

all industries fairly. As an alternative, we can consider the specific changes in representative companies of interest.

Figure 6 shows a sharp decline in AIG's revenues for 2008 after a steady growth pattern during preceding years. This drop reflects the decline present among all of the top companies in the financial sector. While this is probably the most devastating loss in any industry in recent years, it is important to note that performance in the finance sector is dependent upon performance throughout all US industries. In reality, performance is not the true issue as much as perceived performance. To illustrate, we can begin considering manufacturing industries by noting GM's performance since 2006. GM has faced large setbacks due to rising oil prices, increased cost of labor, and a lack of innovation relative to consumer needs. As a result of initial losses, investors lose faith and the company loses financial backing. As the corporation proceeds downhill, their name becomes tarnished as unreliable, and consumers begin to buy from other manufacturers. Here we see a combination of several measures of consumer perception dictating the future of an industry.

On the other hand, we can see Communication, Chemical, and Electronics industries on the rise as a result of unique products and innovation. It is within these sectors that the US is able to produce goods that set the country apart from the rest of the world. In the following sections past trends are considered and forecasts made for the future.

Immediate Past

The revenue and employment trends over the past ten years indicated in two charts in *Figure 7 & Figure 8* where manufacturing industries are grouped by sector with the Finance sector present as a means of comparison within purely service industries. Referring to Table 3 (2005-2007) in the appendix we can see the specific industries within each sector that are leading growth.

We begin by looking at Electronics and Communications industries, noting that Telecommunications and Computer industries have led both revenue and employment over the past few years until 2007 when Computer and Data Services have taken the lead in employment. The rise and fall of the sector in 2000 reflects the dot-com bubble which affected many industries, including those outside this sector. The resilience of this sector that has led to significant growth despite setbacks indicates reliability for investors and a desirable focus for the future of US industry.

The mechanical sector shows relatively steady employment and revenue growth through 2004, reaching a plateau thereafter. Motor Vehicles and Parts have lead the sector with the largest revenue and employment counts, followed by Aerospace and Defense, then Industry and Farm Equipment. The Automotive industry presents itself here as the dominant industry not only in the Mechanical sector, but also across all manufacturing industries. As the Automotive industry accounted for 7.3% of manufacturing revenue and 11% of manufacturing employment in 2007, it is considered the indicator of US manufacturing health. It is important to note that the Mechanical sector is relatively healthy, showing steady growth, outside of the Automotive industry.

Over the past five years the Chemical and Finance sectors have climbed to the top segments of revenue for the US while seeing very little increase in employment. Commercial Banks have led the Finance sector with 58.9% growth in revenues since 2004. The Chemical sector is led by the Petroleum Refining industry with growth in revenues of 45.8% since 2004. Petroleum Refining reflected 46.4% of revenue in the Chemical sector and 19% of total manufacturing revenue in 2007. There are two key industries with promising futures as they lead US industry as of 2007.

Manufacturing Evolves

In the past twenty years manufacturing has changed drastically, previously comprising a majority of revenue within the US. Manufacturing is tending away from the image of a skilled craftsman creating a unique product, toward assembly lines and increasingly efficient mass production. As the world has increased capacity for goods produced, manufacturing industries have answered the call by creating ways to produce at higher volume and lower cost. In general, this means either more capacity is produced without layoffs, or the same capacity is produced and employees lose their jobs as a cost-cutting measure. Looking at the graph of Fortune 1000 company employment in manufacturing sectors from 1996-2007 in *Figure 9*, we can note that the largest manufacturers (i.e., those on the Fortune 1000 list) saw growth in employment from 2003-2007, among other years. However, employment statistics can be deceptive if we consider that a decrease in employment from year to year could mean improved efficiency, not necessarily indicating a decline in profitability. While a downward trend here can be perceived in a variety of ways, an upward trend is an unquestionable indicator of growth. Taking into account the periods of growth in the past ten years we can see that 55% of the past decade (1996-2007) included periods of growth in manufacturing industries, ultimately resulting in an 8% increase in employment in the long run. At least as far as the nation's top companies go, manufacturing is far from dying, but could use some stimulation to keep it from falling under.

The Way of the Future

As US manufacturing and even further, global manufacturing, evolves we can see some of the nation's largest companies finding ways to increase profits despite economic hardships. The nation's economy depends greatly on the most profitable and significant industries. As we see the Automotive industry, among others, becoming less dependable we must look to produce in areas where no other country can truly compete. For Auto Manufacturers this means revolutionizing the US auto industry to provide unique products, such as electric cars, which puts them into a less-crowded segment in the global marketplace. It is with innovation and continual improvement that US companies can expect to see improvement. High-tech industries, including software services and engineering and tech services, gained about 77,000 jobs in 2008, despite losses of 38,000 jobs in the fourth quarter of the year. We can expect to see continued improvement over the next few years in technology and engineering fields as a result of continual improvement which affects profitability within the sector as well as productivity across all of US industry. Many companies, such as IBM and GE, are looking to service and financing as sources of additional revenue. Consulting services such as those provided by IBM will be

useful in reacting to economic instability by finding ways for US manufacturers to re-gain an advantage over foreign competitors.

The Chemical sector shows steady growth and should continue to improve over time as it embraces essential needs for a growing population including oil, pharmaceuticals, and household products. Specifically, US Petroleum refining exemplifies an industry that has a competitive advantage over its global competitors, having the ability to produce at much lower cost.

Conclusion

Much of the research of this paper indicates that the manufacturing sector is not dying but changing. Companies are becoming more efficient with faster lead times and higher quality production. While employee numbers are down in manufacturing industries, technology and service firm numbers are increasing. Many technology and service firms have merely changed labels from “manufacturing” but have not actually altered operations. The most productive companies in the US can compete globally with faster delivery and custom orders among other factors that are too costly and time consuming for manufacturers in China and other international competitors. The US will not be able to win in a battle of mass production to lower costs, but has found its niche in customization and quality. By utilizing these advantages over the competition, US manufacturing will be able to not just survive, but excel in coming years.

Bibliography

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2. Fortune 1000 industry revenues and employment data taken from Fortune.com.
3. COLA taken from Social Security Administration. <<http://www.ssa.gov/OACT/COLA/colaseries.html>>.
4. Quote and other data from Bureau of Labor Statistics from <<http://www.bls.gov/oco/ocos027.htm>>.
5. Department of Commerce data from <<http://www.commerce.gov/>>.
6. US Census Bureau: foreign trade statistics from <<http://www.census.gov/foreign-trade/balance/c5700.html#2008>>.
7. Trade Group: US tech industry gained jobs in 2008. The Industry Standard. 3.30.2009. <<http://www.thestandard.com/news/2009/03/30/trade-group-us-tech-industry-gained-jobs-2008>>.
8. Revenue statistics for companies in 2008 taken from sec.gov financial filings.

Appendix

Figure 1: Annual US Employment from 1999-2008 in Manufacturing taken from Bureau of Labor Statistics

Figure 2: Annual US Employment from 1999-2008 in Goods-Producing taken from Bureau of Labor Statistics

Figure 3: US Census Bureau Foreign Trade statistics

Figure 4: US Census Bureau employment averages based on firm size

Figure 5: Annual US Employment from 1999-2008 in Goods-Producing taken from Bureau of Labor Statistics

Figure 6: Selected Fortune 1000 Companies' Revenues through 2008 by sector

Figure 7: Fortune 1000 companies' COLA adjusted revenues for 1996-2007 by sector

Figure 8: Fortune 1000 employment for 1996-2007 by sector

Figure 9: Fortune 1000 manufacturing employment for 1996-2007

Table 1: Top Fortune Global 500 co. ranked by 2004 revenue and then by industry sector comparing recent years

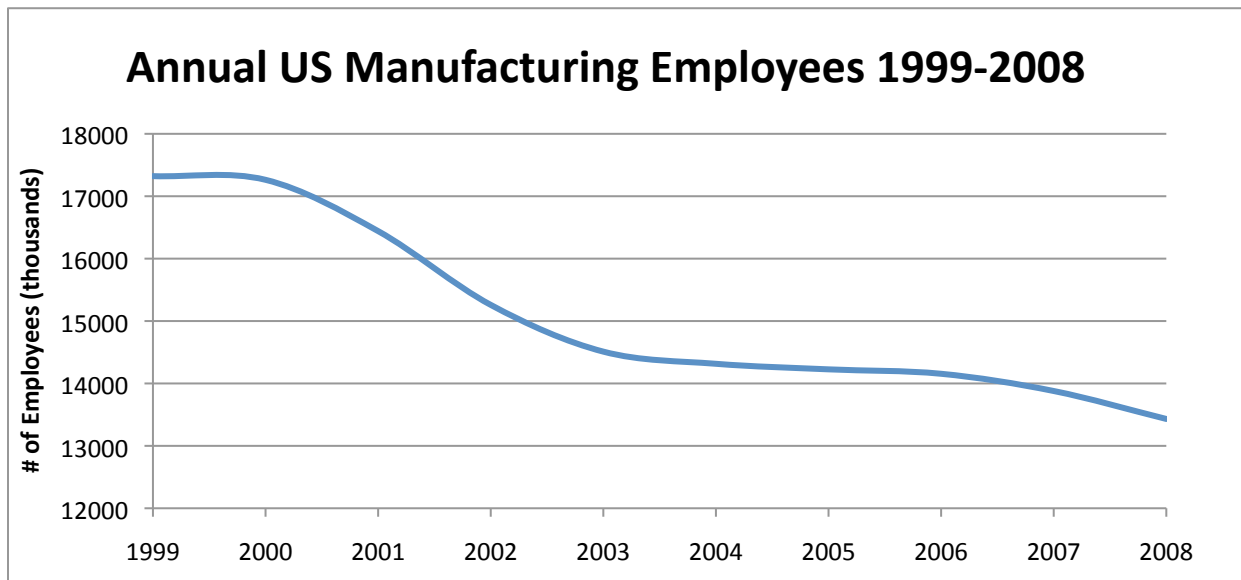
Table 2: Aggregated Fortune 1000 Employment data by Industry Sector – 1996 – 2004

Table 3 (2005): Fortune Manufacturing Industries by Categories/Sectors for 2005

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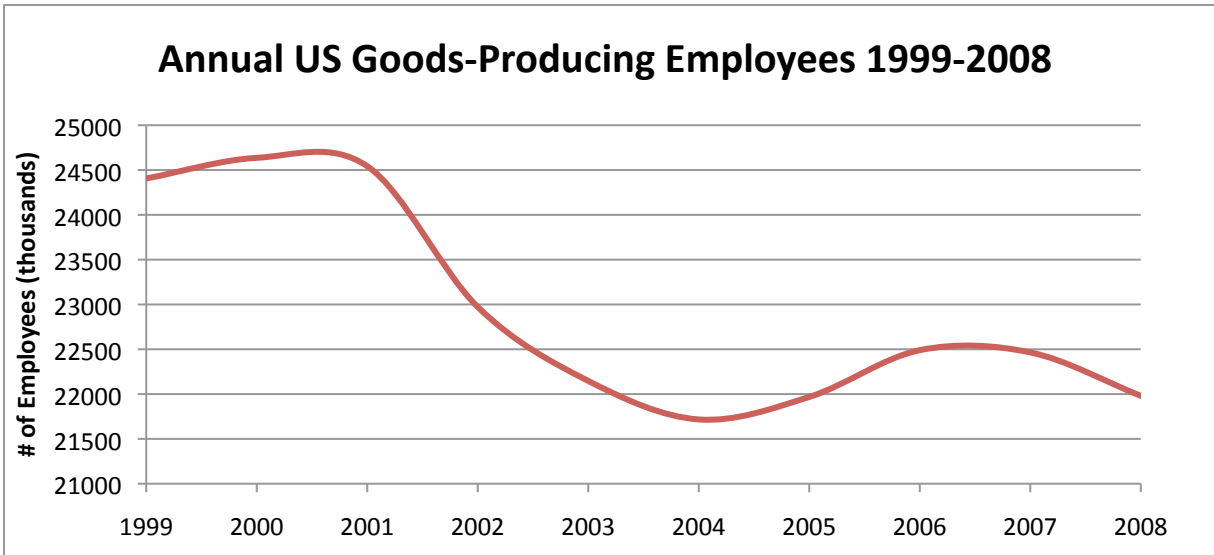
Table 3 (2007): Fortune Manufacturing Industries by Categories/Sectors for 2007

Figures



Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Annual	17322	17263	16441	15259	14510	14315	14226	14155	13879	13431

Figure 1: Annual US Employment from 1999-2008 in Manufacturing taken from Bureau of Labor Statistics⁴



Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Annual	24406	24636	24543	22972	22147	21717	21968	22490	22465	21981

Figure 2: Annual US Employment from 1999-2008 in Goods-Producing taken from Bureau of Labor Statistics⁴

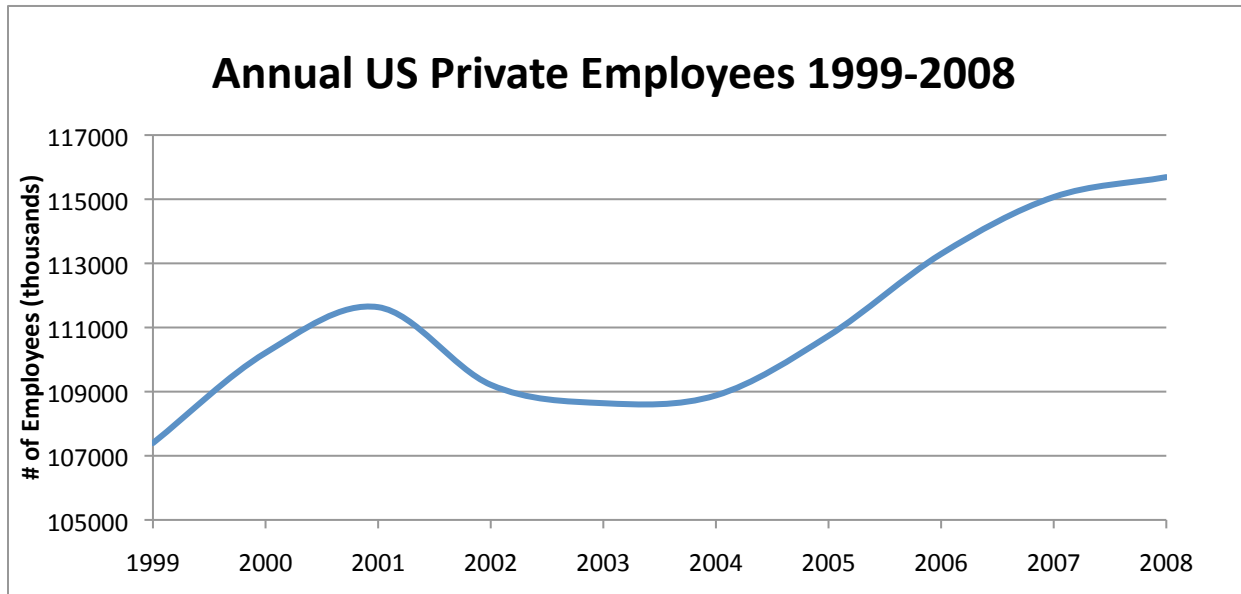
Trade with China			
Year	Exports	Imports	Balance
1985	3,855.70	3,861.70	-6
2008	71,457.10	337,789.80	-266,332.70

Figure 3: US Census Bureau Foreign Trade statistics⁶

NOTE: All figures are in millions of U.S. dollars, and not seasonally adjusted unless otherwise specified

Employment Size of Enterprise	Firms	Establishments	Paid Employees	Annual Payroll (\$1,000)
Employer firms	5,885,784	7,387,724	115,074,924	4,253,995,732
Firms with no employees as of March 12, but with payroll at some time during the year	802,034	803,355	0	40,043,549
Firms with 1 to 4 employees	2,777,680	2,782,252	5,844,637	165,904,564
Firms with 5 to 9 employees	1,043,448	1,055,937	6,852,769	195,519,100
Firms with 10 to 19 employees	632,682	666,574	8,499,681	257,802,789
Firms with 20 to 99 employees	526,355	692,677	20,642,614	670,418,442
Firms with 100 to 499 employees	86,538	330,447	16,757,751	587,676,161
Firms with 500 employees or more	17,047	1,056,482	56,477,472	2,336,631,127
Firms with 500 to 749 employees	5,695	66,305	3,449,491	130,408,281
Firms with 750 to 999 employees	2,709	41,835	2,331,851	87,180,964
Firms with 1,000 to 1,499 employees	2,828	57,479	3,444,427	132,832,629
Firms with 1,500 to 2,499 employees	2,281	76,491	4,396,430	179,582,908
Firms with 2,500 employees or more	3,534	814,372	42,855,273	1,806,626,345
Firms with 2,500 to 4,999 employees	1,739	106,893	6,038,196	262,111,452
Firms with 5,000 to 9,999 employees	905	120,311	6,378,292	278,396,903
Firms with 10,000 employees or more	890	587,168	30,438,785	1,266,117,990

Figure 4: US Census Bureau employment averages based on firm size⁶



Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Jan	107396	110210	111634	109214	108640	108882	110741	113293	115068	115689

Figure 5: Annual US Employment from 1999-2008 in Goods-Producing taken from Bureau of Labor Statistics⁴

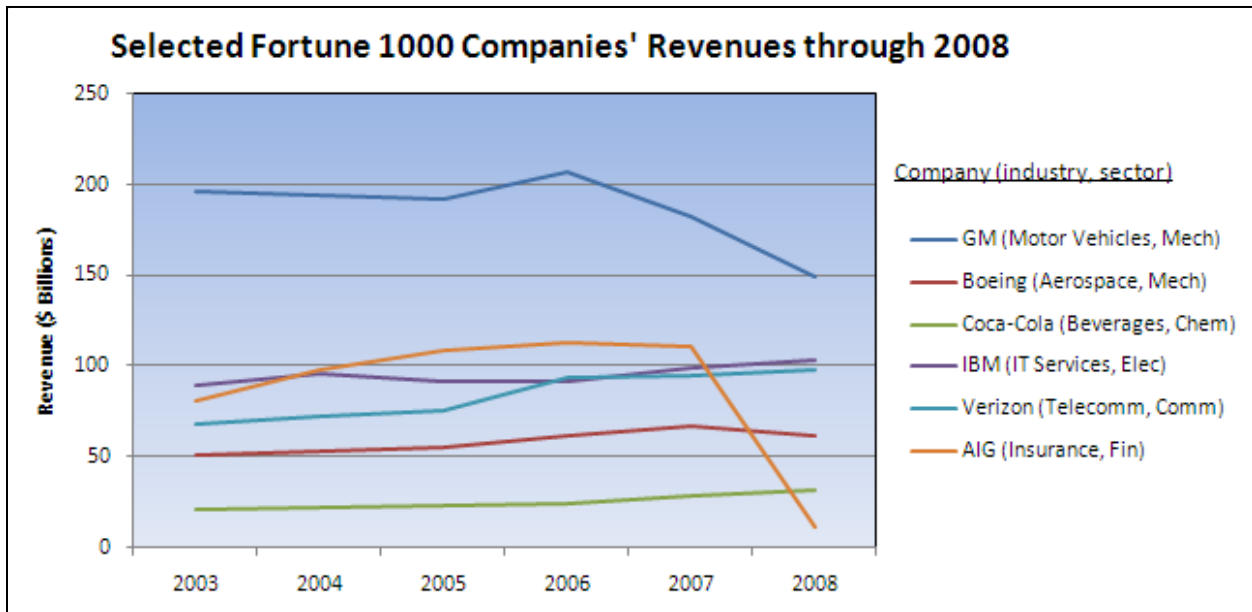


Figure 6: Selected Fortune 1000 Companies' Revenues through 2008 by sector⁸

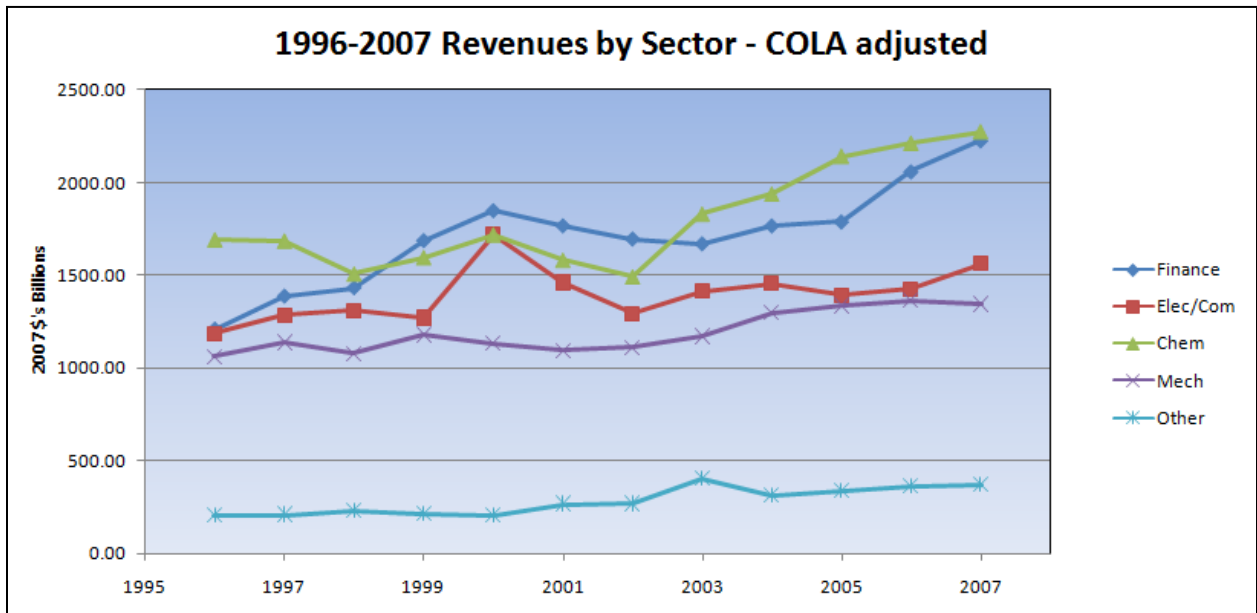


Figure 7: Fortune 1000 companies' COLA adjusted revenues for 1996-2007 by sector ^{2,3}

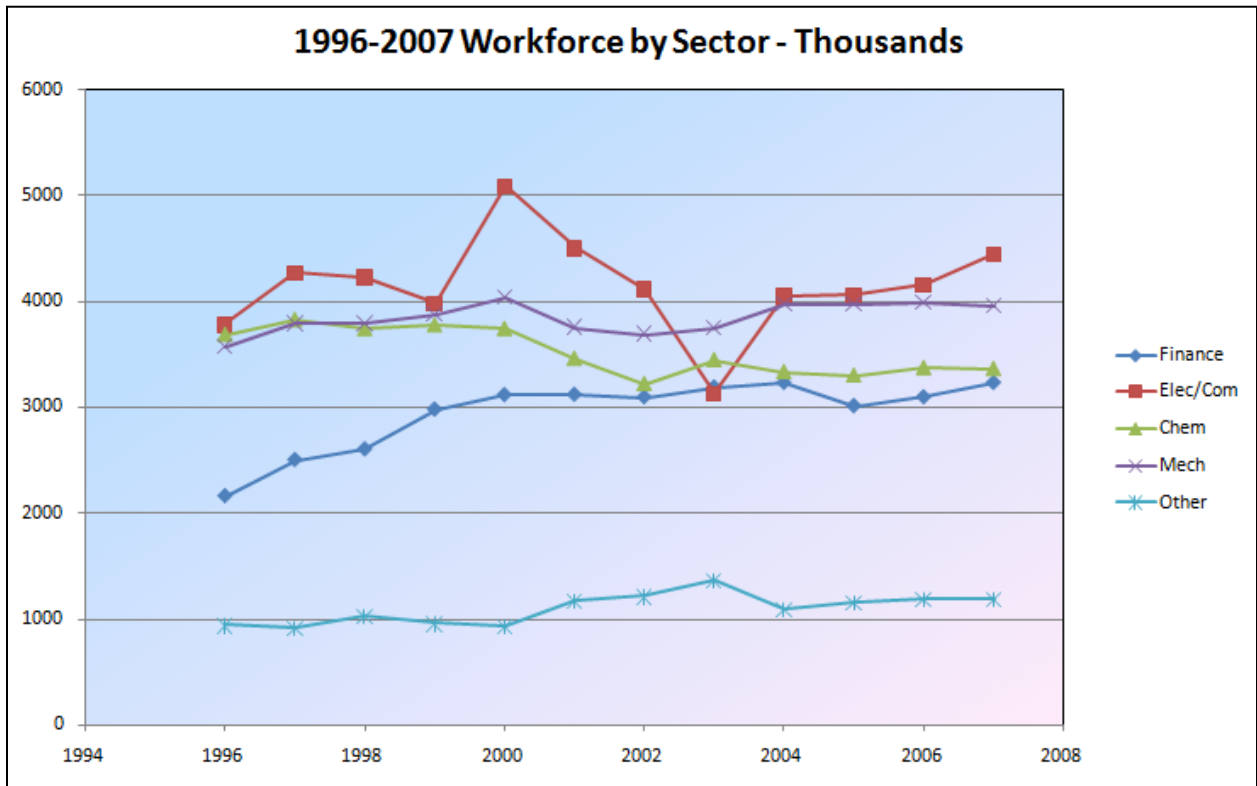


Figure 8: Fortune 1000 employment for 1996-2007 by sector ²

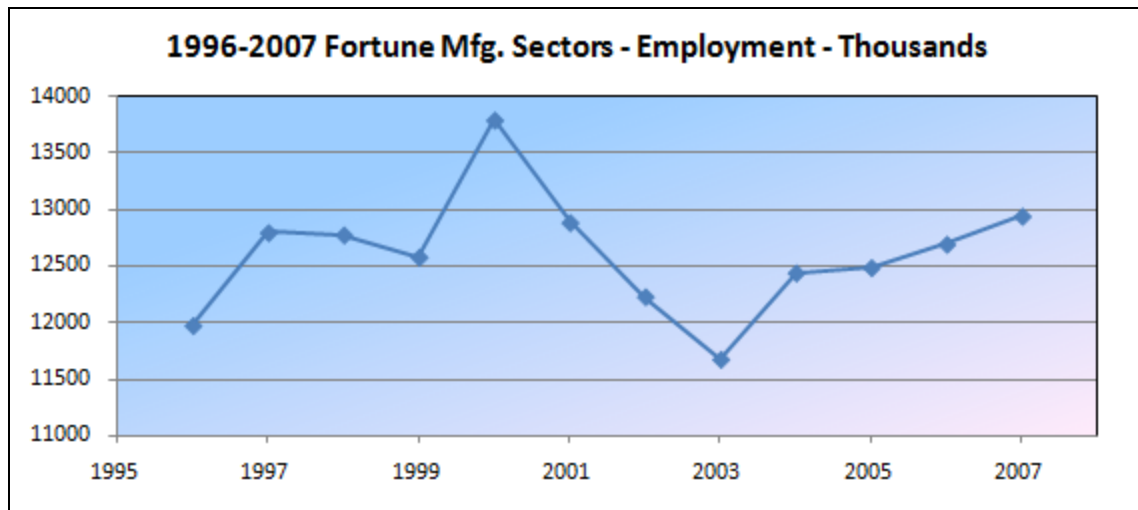


Figure 9: Fortune 1000 manufacturing employment for 1996-2007²

Additional Tables

Table 1 – Aggregated Fortune 1000 Revenue data by Industry Sector – 1996 - 2004

Fortune Manufacturing Industries Revenues by Sector - Actual \$'s Billions												
Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Finance	916.88	1075.00	1125.00	1358.15	1540.84	1510.84	1469.89	1477.74	1605.64	1691.70	2012.92	2227.59
Elec/Com	900.25	997.02	1027.09	1024.14	1433.63	1249.21	1120.27	1251.54	1322.48	1318.07	1393.44	1564.28
Chem	1284.34	1306.05	1183.96	1284.13	1431.87	1351.36	1293.40	1619.03	1760.53	2025.50	2159.97	2271.34
Mech	809.54	886.09	849.39	951.71	946.65	938.47	966.25	1040.00	1183.60	1265.68	1335.19	1347.68
Other	157.73	163.70	180.06	172.97	172.69	229.07	233.28	356.77	282.72	318.07	353.25	372.79
Tot. Mfg.	3151.86	3352.86	3240.50	3432.95	3984.85	3768.12	3613.20	4267.34	4549.33	6619.03	7254.77	7783.66

Fortune Manufacturing Industries Revenues by Sector - 2007 \$'s Billions												
Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Finance	1207.31	1386.41	1432.27	1686.93	1849.12	1767.17	1695.54	1669.53	1766.34	1787.72	2059.22	2227.59
Elec/Com	1185.42	1285.84	1307.62	1272.06	1720.46	1461.15	1292.25	1413.98	1454.84	1392.88	1425.49	1564.28
Chem	1691.17	1684.39	1507.33	1594.99	1718.35	1580.64	1491.96	1829.16	1936.73	2140.47	2209.65	2271.34
Mech	1065.97	1142.77	1081.38	1182.10	1136.05	1097.69	1114.58	1174.98	1302.06	1337.52	1365.90	1347.68
Other	207.69	211.12	229.24	214.84	207.24	267.93	269.09	403.07	311.02	336.13	361.37	372.79
Tot. Mfg.	4150.25	4324.12	4125.57	4263.99	4782.12	4407.43	4167.88	4821.19	5004.65	6994.72	7421.63	7783.66

COLA % *	2.1%	1.3%	2.5%	3.5%	2.6%	1.4%	2.1%	2.7%	4.1%	3.3%	2.3%
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Table 2 - Aggregated Fortune 1000 Employment data by Industry Sector – 1996 - 2004

Fortune 1000 Manufacturing Companies - Employees, Thousands												
Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Finance	2159	2500	2600	2975	3112	3115	3091	3184	3226	3008	3092	3226
Elec/Com	3777	4267	4227	3974	5088	4501	4114	3125	4050	4058	4156	4445
Chem	3688	3829	3741	3778	3743	3460	3218	3445	3332	3300	3371	3362
Mech	3573	3789	3790	3876	4033	3752	3689	3746	3973	3973	3985	3955
Other	937	913	1020	953	931	1174	1210	1360	1086	1157	1183	1182
Tot. Mfg.	11975	12798	12778	12581	13795	12887	12231	11676	12441	12488	12695	12943

Table 3 (2005) - Fortune Manufacturing Industries by Categories/Sectors

Process Sectors	Industries (Fortune index)	#	Firms	Rev \$B	Employ	Total	Total
			2005	2005	2005	Employ	Revenue
CHEM	Beverages (6)		8	84.609	265735		
	Food Products (21)		18	155.805	640130		
	Food Production (22)		8	90.235	283638		
	Chemicals (8)		41	256.467	437235		
	Forest and Paper (25)		7	60.787	147750		
	Household and Personal (32)		13	120.972	365648		
	Petroleum Refining (47)		12	323.398	265357		
	Pharmaceuticals (48)		19	244.148	587183		
	Tobacco (61)	130	4	82.481	240211	3239693	2025.5
MECH	Aerospace and Defense (2)		15	277.476	1031384		
	Engineering Construction (19)		11	47.432	214340		
	Homebuilders (30)		15	107.515	38081		
	Motor Vehicles & Parts (42)		28	583.196	1530417		
	Home Equip. etc.		4	30.087	137638		
	Industry and Farm Equip. (33)		35	197.542	784331		
		Transportation (64)	112	4	16.374	55314	3973365
ELEC	Computer Data and Services (10)		16	88.211	462101		
	Peripherals (11)		6	25.773	87347		
	Software (12)		10	63.309	167310		
	Computers (13)		9	283.814	710748		
	Network & Equip (43)		12	100.066	238458		
	Electronic & Electrical (17)		16	63.154	383603		
	Semiconductors (56)		24	135.909	450271		
	Scientific & Controls (54)		8	37.831	162625		
		Medical Products (33)	117	16	61.06	232822	2835885
COM	Telecommunications (58)		21	283.723	846152		
	GE	22	1	157.153	316000	1162152	440.876
OTHER	Apparel (4)		12	48.141	210957		
	Textiles (61)						
	Building Materials (7)		6	22.242	66540		
	Metals (40)		15	95.192	262133		
	Furniture (26)		7	17.785	101315		
	Toys/sporting Goods (62)		2	8.267	31900		
	Packaging & Containers (45)		15	65.608	240553		
	Waste Management (67)		3	21.673	88500		
		3M (miscellaneous)	66	6	33.165	154708	1156612
Financial	Commercial Banks (9)		30	520.267	1356191		
	Diversified Financials (14)		14	98.953	287144		
	Insurance (Life & Health, mutual) (34)		11	125.303	56316		
	Insurance (Life & Health, stock) (35)		19	161.156	198373		
	Insurance (Property, mutual) (36)		6	72.786	86013		
	Insurance (Property, stock) (37)		34	463.331	714044		
	Saving Institutions (53)		4	33.318	87854		
		Securities (55)	131	13	203.929	222541	3008482
Grand Totals			578	6613.029	15496189	1.5E+07	6613.03

Table 3 (2006) - Fortune Manufacturing Industries by Categories/Sectors

Process Sectors	Industries (Fortune index)	#	Firms	Rev \$B	Employ	Total	Total
			2006	2006	2006	Employ	Revenue
CHEM	Beverages (8)		8	88.927	283683		
	Food Products (20)		20	170.868	643248		
	Food Production (7)		8	30.852	284320		
	Chemicals (40)		42	275.737	503373		
	Forest and Paper (3)		3	66.025	143841		
	Household and Personal (13)		14	138.375	380568		
	Petroleum Refining (14)		14	387.387	233262		
	Pharmaceuticals (48)		13	254.831	537488		
	Tobacco (61)	133	5	86.31	223058	3371441	2153.97
MECH	Aerospace and Defense (2)		16	306.023	1114705		
	Engineering Construction (13)		11	56.14	225106		
	Homebuilders (30)		14	114.383	31674		
	Motor Vehicles & Parts (42)		28	580.503	1523323		
	Home Equip. etc.		5	33.281	142451		
	Industry and Farm Equip. (33)		33	227.12	832137		
		Transportation (64)	117	4	17.132	54304	3384366
ELEC	Computer Data and Services (10)		14	87.226	472550		
	Peripherals (11)		6	25.844	78545		
	Software (12)		7	74.438	173901		
	Computers (13)		10	305.368	770900		
	Network & Equip (43)		11	110.457	237647		
	Electronic & Electrical (17)		14	73.378	331613		
	Semiconductors (56)		23	129.728	414673		
	Scientific & Controls (54)		7	37.668	161500		
	Medical Products (33)	107	15	63.13	235583	2942312	307.837
COM	Telecommunications (58)		18	317.238	834456		
Utilities	GE	13	1	168.307	319000	1213456	485.545
OTHER	Apparel (4)		10	48.021	136830		
	Textiles (61)						
	Building Materials (7)		5	21.504	61658		
	Metals (40)		16	115.815	265343		
	Furniture (26)		7	18.703	100113		
	Toys/sporting Goods (62)		2	8.801	37800		
	Packaging & Containers (45)		16	63.517	243035		
	Waste Management (67)		3	22.463	84350		
	3M (miscellaneous)	67	8	48.416	192213	1182542	353.246
Banking & Financial	Commercial Banks (3)		30	635.472	1447301		
	Diversified Financials (14)		12	150.038	266176		
	Insurance (Life & Health, mutual) (34)		12	134.456	58560		
	Insurance (Life & Health, stock) (35)		17	177.648	182876		
	Insurance (Property, mutual) (36)		5	72.371	83540		
	Insurance (Property, stock) (37)		33	431.653	738236		
	Saving Institutions (53)		4	35.385	71423		
		Securities (55)	130	17	315.236	243324	3031502
	Grand Totals		573	7254.767	15786819	1.6E+07	7254.77

Table 3 (2007) - Fortune Manufacturing Industries by Categories/Sectors

Process Sectors	Industries (Fortune index)	#	Firms	Rev \$B	Employ	Total	Total
			2007	2007	2007	Employ	Revenue
CHEM	Beverages (6)		8	36.2242	307294		
	Food Products (21)		20	203.6401	686819		
	Food Production (22)		7	101.7162	281063		
	Chemicals (8)		40	267.789	515454		
	Forest and Paper (25)		9	58.1904	145192		
	Household and Personal (32)		13	149.0839	375550		
	Petroleum Refining (47)		14	1054.9962	300200		
	Pharmaceuticals (48)		21	283.7921	625414		
	Tobacco (61)	137	5	53.9084	125510	3362436	2271.34
MECH	Aerospace and Defense (2)		16	333.0454	1143198		
	Engineering Construction (19)		12	76.3594	333371		
	Homebuilders (30)		12	78.3668	56355		
	Motor Vehicles & Parts (42)		27	570.3605	1427979		
	Home Equip. etc.		4	31.1954	130527		
	Industry and Farm Equip. (33)		36	240.8213	808176		
		Transportation (64)	111	4	17.5267	54405	3954611
ELEC	Computer Data and Services (10)		20	206.2337	888764		
	Peripherals (11)		5	28.5384	89957		
	Software (12)		6	83.4271	215633		
	Computers (13)		7	232.8488	431065		
	Network & Equip (43)		10	101.8604	221682		
	Electronic & Electrical (17)		15	80.3526	414638		
	Semiconductors (56)		23	138.7266	420913		
	Scientific & Controls (54)		8	45.2964	166300		
	Medical Products (33)	110	14	67.1098	231680	3180632	390.334
COM	Telecommunications (58)		22	397.2273	936926		
Utilities	GE	23	1	176.656	327000	1263926	573.883
OTHER	Apparel (4)		11	54.7911	218316		
	Textiles (61)						
	Building Materials (7)		5	19.9567	62477		
	Metals (40)		17	118.4243	252218		
	Furniture (26)		7	18.4235	86473		
	Toys/Sporting Goods (62)		2	3.8077	36885		
	Packaging & Containers (45)		18	77.9187	257898		
	Waste Management (67)		3	22.6043	83450		
		3M (miscellaneous)	72	3	50.8588	184070	1181787
Packaging Financial	Commercial Banks (9)		27	686.4302	1503383		
	Diversified Financials (14)		16	236.4092	302578		
	Insurance (Life & Health, mutual) (34)		12	139.6745	61272		
	Insurance (Life & Health, stock) (35)		15	174.2399	163715		
	Insurance (Property, mutual) (36)		4	72.4635	80346		
	Insurance (Property, stock) (37)		32	514.4425	768425		
	Saving Institutions (53)		5	36.3744	75408		
	Securities (55)	131	20	367.5523	253309	3226436	2227.59
Grand Totals			584	7783.6647	16163888	1.6E+07	7783.66