

## **Immigrants and Industrialization in the American Economy, 1880 to 1920**

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September 22, 2005

This is a preliminary abstract of a work-in-progress submitted for consideration in the program of the 2006 meetings of the Population Association of America. Contact Charles Hirschman at [charles@u.washington.edu](mailto:charles@u.washington.edu) and Liz Mogford at [lmogford@u.washington.edu](mailto:lmogford@u.washington.edu)

### **Extended Abstract**

In 1880, almost half of the gainfully employed workers in the United States were engaged in agriculture, and the American industrial economy was on the periphery of the national and world economy. Employing only about one in seven workers, the manufacturing sector in 1880, with few exceptions, consisted of small enterprises that relied on traditional technology to produce goods for local markets. By 1920, the American economy had been transformed with the development of capital-intensive production of steel, mechanical and electrical machinery, and garments that served a national market. For example, almost a half-million workers were employed in motor vehicle production in 1920, an industry that did not exist in the 19<sup>th</sup> century. One in four American workers in 1920 were employed in manufacturing, which was about the same as the proportion of employment in agriculture.

The decades surrounding 1900 were not only the age of industrialization, but also an age of immigration and urbanization. The American population doubled from 50 million in 1880 to more than 100 million in 1920 and more than 20 million immigrants arrived on American shores during these four decades. In spite of a substantial return migration, most of these new immigrants and their children settled in American cities and participated in the emerging American industrial economy. In this study, we review the literature in economic history on the impact of immigration on industrialization and measure the contribution of immigrants and their descendants on the growth and industrial transformation of the American workforce from 1880 to 1920.

There is an unresolved debate on the impact of immigration on aggregate economic growth during the age of industrialization. On one hand, Hatton and Williamson (1998: chapter 8) conclude that the mass migration from Europe in the two decades before World War I did not have a positive impact on the economy. Their analyses show that

immigrants did not fill labor shortages, but rather lowered wages in unskilled jobs and displaced native-born workers in the northeast who moved to the west.

On the other hand, Carter and Sutch (1998) argue that many of Hatton and Williamson's conclusions were determined by their assumptions and model specifications. Carter and Sutch (1998: 314-344) observe that economic growth did not slow during the years of mass immigration to the United States (Rees 1961). They also argue that immigrants contributed to economic growth (and rising real wages for the native born) through a variety of mechanisms, including increased national savings, a faster rate of inventive activity and technological innovation, and increasing economies of scale, both in production and in consumer markets.

In his analysis of long swings, or Kuznets cycles, Easterlin (1968) found that immigration (and population growth) and subsequent family formation stimulated economic growth through increasing demand for housing, urban development, and other amenities. This association was strongest, Easterlin noted, before the post World War II era when the federal government assumed more responsibility for maintaining aggregate demand.

In our proposed analysis, we examine the role of mass immigration on the growth and transformation of the labor force during the era of major structural change from a predominately agrarian structure in 1880 to the emerging industrial structure of 1920. The general plan of our analysis is illustrated in preliminary fashion in Tables 1 and 2.

In Table 1, we present a basic descriptive account of changes in the industrial structure of the labor force (gainful workers) from 1880 to 1920, the absolute and percentage changes in each industry, the immigrant share of each industry, and immigrant growth as a percentage of the total growth in each sector. The immigrant population is defined as inclusive of both the first (foreign born) and second (children of the foreign born) generations.

In 1880, at the eve of the age of mass migration and when almost half the workforce was in the agricultural sector, immigrants and their children compromised about one third of all workers. This fraction—the immigrant share (counting both immigrants and their children) of gainful workers—increased to 40 percent in 1920. From 1880 to 1920, the workforce grew from 16 to 40 million—an expansion of more than 150 percent or 24 million workers. There were 16 million first and second-generation workers in 1920 (out of a total 40 million workers), and the expansion of immigrants accounted for almost half (44 percent) of the total growth of workers from 1880 to 1920. Immigrants accounted for a significant share of the growth in all sectors, varying from a low of 28 percent in agriculture (which only grew at one-third of the overall workforce) to more than half of the growth of manufacturing, which almost quadrupled from 1880 to 1920.

These results suggest that immigrants were primarily going to fill the labor needs of a rapidly developing industrial economy. Only a small number of immigrants entered agriculture and relatively few were in the skilled service sectors created by an expanding public sector. Immigrants were over-represented in the hard and dirty jobs in coal and

iron ore mining, blast furnaces and steel mills, and the sweatshops of the garment and apparel trade. In examining comparable data, the author of the 1920 census report on immigrants commented, “It would seem that, generally speaking, the foreign born population is engaged in more laborious, disagreeable, and probably, less skilled and less remunerative work than are the native born white” (Carpenter 1927:271).

The more difficult question to address is whether it might have been possible to create a modern industrial economy without immigrant labor. Although there is no simple counterfactual that would resolve this question, we can indirectly measure the economic responsiveness of domestic labor to the growth of the industrial economy with a simple model that compares actual growth with expected growth across sectors. Table 2 shows the absolute number of workers and immigrant workers by industry in columns 1 and 2. For example, there were 40.5 million workers in 1920; of whom 16.3 million were immigrants (total first and second generation).

The 1920 figures for each sector or industry can be assumed to be the sum of three components: (1) the continuity or reproduction of workers from 1880, (2) the shift of 1880 workers (or their descendents) from 1880 to 1920, and (3) the arrival of new immigrants and their children. If we assume that (3) is represented by the numbers of first- and second-generation immigrants in 1920, then (1) and (2) can be estimated with some simple assumptions.

Let us assume that the 1880 workforce is transformed into the 1920 3<sup>rd</sup> and higher generation workforce by a growth rate equal to the ratio of 1920 3<sup>rd</sup> and higher generation workers to the total number of 1880 workers. For the total workforce, this is an identity—the growth rate is estimated by the observed 1920 population divided by the initial population. This growth rate encompasses all the demographic process that produce 1920 workers from 1880 workers, including survival of some workers, the deaths of others, and the reproduction (fertility) of 1880 workers who have children in the labor force in 1920. For the purposes of creating a counterfactual, we assume that this growth rate is constant across generations (3<sup>rd</sup> and higher in 1880 and 1<sup>st</sup>/2<sup>nd</sup> in 1880) and across industries. The difference between the 1920 actual and expected workers in each sector represents the “structural shift” between sectors. Akin to the logic from demographic decomposition models and shift-share analysis, the shift means that some workers (or their descendents) moved from one industry to another from 1880 to 1920 (or from the industry held by their ancestor in 1880). Although it is possible to divide the “shift” into components attributable to 3<sup>rd</sup> and higher generation and 1<sup>st</sup> and 2<sup>nd</sup> generation workers in 1880, we have not done so here. In the full version of this paper, we will also explain these assumptions at greater length.

The final columns of Table 2 show the domestic and immigrant “shares” of the 1920 labor force for each industry. The immigrant share includes the 1<sup>st</sup> and 2<sup>nd</sup> generation in 1920 plus the reproduction (continuity, fertility, etc.) of 1880 1<sup>st</sup> and 2<sup>nd</sup> generation workers in that industry. For example, of the 10 million workers in manufacturing in 1920, 5.3 million are 1<sup>st</sup> and 2<sup>nd</sup> generation immigrants in 1920 and another 2 million can be assumed to be the descendents of 1<sup>st</sup> and 2<sup>nd</sup> generation immigrants who worked in

manufacturing in 1880. A conservative estimate is that three-quarters of the manufacturing workers in 1920 are 1<sup>st</sup>, 2<sup>nd</sup>, or 3<sup>rd</sup> generation immigrants.

The final version of the paper will provide a detailed assessment of these results for each major industrial sector and their relevance for the debate over the impact of immigration during the age of industrialization.

Table 1. Industrial Structure of the Employed Population in 1880 and 1920, Percent Immigrant (1st and 2nd Generation) and Percent Change from 1880 to 1920

0 N/A (not in labor force)	% in Industry of Total LF		% Immigrant of Industry		1880 to 1920 Change		Immigrant Grwth % of Total Grwth
	1880	1920	1880	1920	Absolute (in 000)	Relative in (%)	
<b>AGRICULTURE</b>	<b>46.7%</b>	<b>25.3%</b>	<b>20%</b>	<b>23%</b>	<b>3447</b>	<b>51%</b>	<b>28%</b>
<b>MINING</b>	<b>1.9%</b>	<b>3.1%</b>	<b>66%</b>	<b>47%</b>	<b>989</b>	<b>361%</b>	<b>42%</b>
206 Metal mining	0.2%	0.4%	52%	66%	156	645%	68%
216 Coal mining	0.5%	2.1%	67%	50%	755	#	49%
226 Crude petroleum and natural gas extraction	0.1%	0.4%	32%	13%	137	#	12%
236 Nonmetallic mining and quarrying, except fuel	1.2%	0.3%	69%	40%	-58	-35%	122%
<b>246 CONSTRUCTION</b>	<b>4.8%</b>	<b>4.8%</b>	<b>42%</b>	<b>45%</b>	<b>1246</b>	<b>182%</b>	<b>46%</b>
<b>MANUFACTURING</b>	<b>14.3%</b>	<b>24.8%</b>	<b>57%</b>	<b>53%</b>	<b>7916</b>	<b>383%</b>	<b>52%</b>
<i>Wood and Mineral Products (incl. logging/sawmills)</i>	<i>2.5%</i>	<i>3.2%</i>	<i>53%</i>	<i>37%</i>	<i>918</i>	<i>253%</i>	<i>31%</i>
<i>Metals (Steel and Iron)</i>	<i>1.4%</i>	<i>3.7%</i>	<i>62%</i>	<i>57%</i>	<i>1295</i>	<i>630%</i>	<i>56%</i>
336 Blast furnaces, steel works, & rolling mills	0.5%	1.4%	66%	56%	492	663%	54%
337 Other primary iron and steel industries	0.2%	0.8%	57%	57%	285	#	57%
338 Primary nonferrous industries	0.2%	0.3%	58%	62%	115	442%	63%
346 Fabricated steel products	0.5%	1.0%	60%	56%	319	490%	55%
347 Fabricated nonferrous metal products	0.0%	0.1%	83%	59%	39	#	57%
348 Not specified metal industries	0.1%	0.1%	56%	63%	45	323%	66%
<i>Machinery</i>	<i>0.7%</i>	<i>5.0%</i>	<i>48%</i>	<i>54%</i>	<i>1894</i>	<i>#</i>	<i>54%</i>
356 Agricultural machinery and tractors	0.1%	0.1%	54%	51%	45	365%	50%
357 Office and store machines	0.0%	0.1%	0%	43%	39	#	44%
358 Misc machinery	0.1%	1.5%	60%	58%	611	#	58%
367 Electrical machinery, equipment and supplies	0.0%	0.6%	67%	54%	241	#	54%
376 Motor vehicles and motor vehicle equipment	0.0%	1.2%	0%	54%	485	#	54%
378 Ship and boat building and repairing	0.0%	1.0%	43%	51%	387	#	51%
379 Railroad and misc transportation equipment	0.5%	0.4%	45%	51%	83	111%	56%
<i>Food &amp; Tobacco</i>	<i>1.6%</i>	<i>2.5%</i>	<i>58%</i>	<i>50%</i>	<i>773</i>	<i>338%</i>	<i>48%</i>
<i>Textiles/Footwear/Leather</i>	<i>4.2%</i>	<i>4.8%</i>	<i>64%</i>	<i>62%</i>	<i>1322</i>	<i>220%</i>	<i>61%</i>
436 Knitting mills	0.0%	0.3%	46%	49%	122	#	49%
437 Dyeing and finishing textiles, except knit goods	0.0%	0.1%	83%	67%	42	891%	66%
438 Carpets, rugs, and other floor coverings	0.1%	0.1%	80%	71%	20	145%	65%
439 Yarn, thread, and fabric	1.7%	2.0%	72%	58%	539	216%	51%
446 Misc textile mill products	0.2%	0.2%	62%	68%	35	127%	74%
448 Apparel and accessories	0.3%	1.1%	67%	73%	404	895%	73%
449 Misc fabricated textile products	0.1%	0.1%	64%	71%	26	309%	73%
487 Leather: tanned, curried, and finished	0.4%	0.2%	52%	62%	24	41%	84%
488 Footwear, except rubber	1.2%	0.6%	56%	57%	88	52%	58%
489 Leather products, except footwear	0.1%	0.1%	50%	62%	23	142%	71%
<i>Paper and Printing</i>	<i>1.0%</i>	<i>1.6%</i>	<i>52%</i>	<i>49%</i>	<i>487</i>	<i>354%</i>	<i>49%</i>
<i>Chemical/Petro/Rubber</i>	<i>0.2%</i>	<i>1.6%</i>	<i>64%</i>	<i>46%</i>	<i>594</i>	<i>#</i>	<i>45%</i>
<i>Miscellaneous</i>	<i>2.8%</i>	<i>2.6%</i>	<i>53%</i>	<i>57%</i>	<i>631</i>	<i>158%</i>	<i>60%</i>
<b>TRANSPORTATION, COMMUNICATION AND UTILITIES</b>	<b>4.5%</b>	<b>9.4%</b>	<b>45%</b>	<b>40%</b>	<b>3150</b>	<b>482%</b>	<b>39%</b>
506 Railroads and railway	1.9%	5.1%	47%	38%	1764	648%	36%
516 Street railways and bus lines	0.1%	0.5%	49%	45%	204	#	44%
526 Trucking service	1.1%	1.1%	48%	39%	266	167%	34%
527 Warehousing and storage	0.0%	0.1%	19%	41%	55	#	41%
536 Taxicab service	0.0%	0.2%	55%	43%	73	#	42%
546 Water transportation	0.9%	0.6%	42%	54%	124	96%	66%
578 Telephone	0.0%	0.7%	52%	36%	275	#	36%
579 Telegraph	0.1%	0.2%	36%	36%	60	301%	36%
586 Electric light and power	0.0%	0.3%	50%	37%	108	#	37%
587 Gas and steam supply systems	0.0%	0.2%	59%	46%	69	1494%	45%
<b>WHOLESALE AND RETAIL TRADE</b>	<b>9.1%</b>	<b>12.1%</b>	<b>52%</b>	<b>49%</b>	<b>3581</b>	<b>273%</b>	<b>49%</b>
<i>Wholesale</i>	<i>1.5%</i>	<i>2.1%</i>	<i>38%</i>	<i>45%</i>	<i>646</i>	<i>295%</i>	<i>47%</i>
<i>Retail</i>	<i>7.6%</i>	<i>10.0%</i>	<i>54%</i>	<i>50%</i>	<i>2935</i>	<i>268%</i>	<i>49%</i>
<b>PRODUCER SERVICES</b>	<b>1.9%</b>	<b>4.1%</b>	<b>31%</b>	<b>43%</b>	<b>1368</b>	<b>489%</b>	<b>46%</b>
716 Banking and credit	0.2%	0.7%	24%	37%	260	#	38%
726 Security and commodity brokerage and invest comp	0.1%	0.2%	25%	42%	68	329%	47%
736 Insurance	0.1%	0.6%	23%	40%	233	#	41%
746 Real estate	0.1%	0.6%	27%	43%	208	#	44%
806 Advertising	0.0%	0.1%	25%	50%	25	#	50%
807 Accounting, auditing, and bookkeeping services	0.4%	0.3%	41%	49%	39	62%	61%
808 Misc business services	0.4%	1.1%	40%	52%	382	652%	54%
879 Legal services	0.5%	0.4%	21%	35%	79	121%	46%
898 Engineering and architectural services	0.1%	0.2%	34%	37%	69	465%	38%
<b>PERSONAL SERVICES</b>	<b>12.9%</b>	<b>9.5%</b>	<b>45%</b>	<b>39%</b>	<b>1975</b>	<b>106%</b>	<b>34%</b>
816 Auto repair services and garages		0.8%		32%	340		
817 Misc repair services	1.6%	0.6%	47%	42%	-3	-1%	412%
826 Private households	7.8%	4.3%	43%	34%	597	53%	18%
836 Hotels and lodging places	0.7%	1.3%	41%	43%	408	424%	43%
846 Laundering, cleaning, and dyeing	0.4%	0.5%	53%	46%	147	258%	43%
847 Dressmaking shops	1.6%	0.6%	49%	45%	11	5%	-50%
848 Shoe repair shops	0.0%	0.2%	46%	72%	73	#	72%
849 Misc personal services	0.5%	0.7%	48%	42%	226	311%	41%
857 Theaters and motion pictures	0.0%	0.3%	100%	43%	114	#	43%
858 Bowling alleys, and billiard and pool parlors	0.0%	0.1%	43%	45%	34	#	45%
859 Misc entertainment and recreation services	0.3%	0.2%	49%	50%	28	58%	52%
<b>SOCIAL SERVICES</b>	<b>3.9%</b>	<b>6.9%</b>	<b>27%</b>	<b>36%</b>	<b>2201</b>	<b>389%</b>	<b>38%</b>
868 Medical and other health services, except hospitals	0.7%	0.8%	17%	36%	211	198%	46%
869 Hospitals	0.0%	0.4%	62%	46%	166	#	46%
888 Educational services	1.6%	2.4%	24%	30%	735	309%	32%
896 Welfare and religious services	0.5%	0.5%	37%	42%	127	162%	45%
897 Nonprofit membership organizs.	0.0%	0.1%	25%	39%	38	#	39%
899 Misc professional and related	0.1%	0.1%	34%	48%	23	218%	55%
906 Postal service	0.2%	0.5%	23%	32%	191	787%	33%
916 Federal public administration	0.3%	0.9%	43%	33%	321	828%	32%
926 State public administration	0.0%	0.1%	35%	34%	25	553%	34%
936 Local public administration	0.4%	1.1%	33%	46%	364	581%	49%
Total Labor Force	16,553	40,519	35%	40%	23,966	145%	44%
Total Labor Force minus Unknown and N/A	14,427	40,519	35%	40%	25,873	179%	43%

Note: # indicates 1,000 or higher percent increase

Table 2. Changes in Actual and Expected Industrial Structure of the Employed Population, by Immigrant Generation, 1880 to 1920

	Expected 1920 Industrial Structure: $r = 1880 \text{ Populations}$					SHARE OF 1920 LABOR FORCE				
	1920 Employed Pop		$r = (1920 \text{ 3rd Gen} / 1880 \text{ Total Pop})$			SHIFT Actual - Expected	DOMESTIC SHARE		IMMIGRANT SHARE	
	Total	1st & 2nd	1880 Total	1880 3rd Gen	1880 1st & 2nd		1880 3rd Gen	SHIFT	From 1880	New
	1	2	3	4	5	6	7	8	10	11
						(1-3)	(4/1)	(6/1)	(5/1)	(2/1)
<b>AGRICULTURE</b>	<b>10179</b>	<b>2329</b>	<b>11242</b>	<b>8940</b>	<b>2302</b>	<b>-3391</b>	<b>88%</b>	<b>-33%</b>	<b>23%</b>	<b>23%</b>
<b>MINING</b>	<b>1263</b>	<b>599</b>	<b>457</b>	<b>156</b>	<b>301</b>	<b>207</b>	<b>12%</b>	<b>16%</b>	<b>24%</b>	<b>47%</b>
206 Metal mining	180	118	40	19	21	21	11%	12%	12%	66%
216 Coal mining	830	419	125	41	84	286	5%	34%	10%	50%
226 Crude petroleum and natural gas extraction	144	19	12	8	4	113	6%	78%	3%	13%
236 Nonmetallc mining and quarrying, except fuel	109	44	279	88	191	-214	81%	-196%	176%	40%
<b>246 CONSTRUCTION</b>	<b>1932</b>	<b>861</b>	<b>1146</b>	<b>668</b>	<b>477</b>	<b>-75</b>	<b>35%</b>	<b>-4%</b>	<b>25%</b>	<b>45%</b>
<b>MANUFACTURING</b>	<b>9985</b>	<b>5288</b>	<b>3455</b>	<b>1469</b>	<b>1985</b>	<b>1242</b>	<b>15%</b>	<b>12%</b>	<b>20%</b>	<b>53%</b>
<i>Wood and Mineral Products</i>	<b>1281</b>	<b>476</b>	<b>605</b>	<b>283</b>	<b>322</b>	<b>199</b>	<b>22%</b>	<b>16%</b>	<b>25%</b>	<b>37%</b>
<i>Metals (Steel and Iron)</i>	<b>1501</b>	<b>857</b>	<b>343</b>	<b>132</b>	<b>212</b>	<b>300</b>	<b>9%</b>	<b>20%</b>	<b>14%</b>	<b>57%</b>
336 Blast furnaces, steel works, & rolling mills	567	316	124	42	82	126	7%	22%	15%	56%
337 Other primary iron and steel industries	309	177	40	17	23	92	6%	30%	7%	57%
338 Primary nonferrous industries	141	88	43	18	25	10	13%	7%	18%	62%
346 Fabricated steel products	384	215	109	43	65	61	11%	16%	17%	56%
347 Fabricated nonferrous metal products	41	24	4	1	3	13	2%	32%	8%	59%
348 Not specified metal industries	59	37	23	10	13	-2	18%	-3%	22%	63%
<i>Machinery</i>	<b>1996</b>	<b>1081</b>	<b>170</b>	<b>89</b>	<b>81</b>	<b>745</b>	<b>4%</b>	<b>37%</b>	<b>4%</b>	<b>54%</b>
356 Agricultural machinery and tractors	57	29	21	9	11	7	16%	13%	20%	51%
357 Office and store machines	39	17	1	1		21	2%	55%	0%	43%
358 Misc machinery	623	364	19	8	12	239	1%	38%	2%	58%
367 Electrical machinery, equipment and supplies	242	131	1		1	110	0%	45%	0%	54%
376 Motor vehicles and motor vehicle equipment	485	261				224	0%	46%	0%	54%
378 Ship and boat building and repairing	389	197	4	2	2	188	1%	48%	0%	51%
379 Railroad and misc transportation equipment	157	80	124	68	55	-47	44%	-30%	35%	51%
<i>Food &amp; Tobacco</i>	<b>1002</b>	<b>500</b>	<b>382</b>	<b>161</b>	<b>221</b>	<b>120</b>	<b>16%</b>	<b>12%</b>	<b>22%</b>	<b>50%</b>
406 Meat products	132	70	7	3	4	56	2%	42%	3%	53%
407 Dairy products	62	25	11	7	4	26	11%	42%	7%	40%
408 Canning and preserving fruits, vegetables, and seafoods	64	30	6	3	3	28	5%	43%	5%	48%
409 Grain-mill products	88	30	99	71	28	-40	81%	-46%	31%	34%
416 Bakery products	177	116	71	17	54	-10	9%	-5%	31%	65%
417 Confectionary and related products	77	43	18	5	13	16	6%	21%	17%	55%
418 Beverage industries	48	31	31	7	24	-15	14%	-31%	51%	65%
419 Misc food preparations and kindred products	104	52	13	6	7	39	6%	38%	7%	50%
426 Not specified food industries	53	25	2		1	26	0%	50%	3%	47%
429 Tobacco manufactures	197	79	124	42	82	-7	21%	-3%	42%	40%
<i>Textiles/Footwear/Leather</i>	<b>1923</b>	<b>1189</b>	<b>1003</b>	<b>360</b>	<b>643</b>	<b>-269</b>	<b>19%</b>	<b>-14%</b>	<b>33%</b>	<b>62%</b>
436 Knitting mills	130	64	12	6	5	54	5%	42%	4%	49%
437 Dyeing and finishing textiles, except knit goods	46	31	8	1	6	7	3%	16%	14%	67%
438 Carpets, rugs, and other floor coverings	34	24	23	5	18	-13	14%	-39%	54%	71%
439 Yarn, thread, and fabric	788	456	416	115	302	-84	15%	-11%	38%	58%
446 Misc textile mill products	63	43	46	18	29	-27	28%	-42%	45%	68%
448 Apparel and accessories	449	327	75	25	50	47	6%	10%	11%	73%
449 Misc fabricated textile products	35	25	14	5	9	-4	15%	-11%	26%	71%
487 Leather: tanned, curried, and finished	81	50	96	46	50	-65	56%	-80%	62%	62%
488 Footwear, except rubber	259	146	285	126	159	-173	49%	-67%	62%	57%
489 Leather products, except footwear	39	24	27	13	13	-12	34%	-31%	34%	62%

<b>Paper and Printing</b>	<b>625</b>	<b>309</b>	<b>230</b>	<b>110</b>	<b>119</b>	<b>86</b>	<b>18%</b>	<b>14%</b>	<b>19%</b>	<b>49%</b>
456 Pulp, paper, and paper-board mills	157	82	33	15	18	42	9%	27%	12%	52%
457 Paperboard containers and boxes	23	14	19	7	12	-11	31%	-46%	54%	61%
458 Misc paper and pulp products	19	11	4	2	2	4	9%	23%	13%	55%
459 Printing, publishing, and allied industries	425	202	173	87	86	50	20%	12%	20%	47%
<b>Chemical/Petro/Rubber</b>	<b>628</b>	<b>289</b>	<b>57</b>	<b>21</b>	<b>36</b>	<b>282</b>	<b>3%</b>	<b>45%</b>	<b>6%</b>	<b>46%</b>
467 Drugs and medicines	20	9	2	1	1	9	5%	46%	3%	45%
468 Paints, varnishes, and related products	24	15	5	2	3	4	7%	18%	13%	62%
469 Misc chemicals and allied products	227	99	32	12	21	95	5%	42%	9%	44%
476 Petroleum refining	142	52	4	2	2	86	2%	60%	1%	37%
477 Misc petroleum and coal products	20	12	1		1	7	2%	35%	5%	58%
478 Rubber products	195	102	12	4	9	81	2%	41%	5%	52%
<b>Miscellaneous</b>	<b>1029</b>	<b>586</b>	<b>665</b>	<b>314</b>	<b>351</b>	<b>-222</b>	<b>31%</b>	<b>-22%</b>	<b>34%</b>	<b>57%</b>
386 Professional equipment	37	22	4	1	3	10	4%	28%	8%	60%
387 Photographic equipment and supplies	12	6	1			5	3%	45%	3%	50%
388 Watches, clocks, and clockwork-operated devices	35	21	45	19	25	-31	56%	-89%	73%	60%
399 Misc manufacturing industries	424	239	123	54	69	62	13%	15%	16%	56%
499 Not specified manufacturing industries	523	299	493	240	254	-269	46%	-52%	49%	57%
<b>TRANSPORTATION, COMMUNICATION AND UTILITIES</b>	<b>3804</b>	<b>1517</b>	<b>1092</b>	<b>599</b>	<b>493</b>	<b>1195</b>	<b>16%</b>	<b>31%</b>	<b>13%</b>	<b>40%</b>
506 Railroads and railway	2036	764	455	243	212	817	12%	40%	10%	38%
516 Street railways and bus lines	222	99	29	15	14	94	7%	42%	6%	45%
526 Trucking service	425	166	265	139	126	-6	33%	-1%	30%	39%
527 Warehousing and storage	57	23	3	2	1	31	4%	55%	1%	41%
536 Taxicab service	80	34	11	5	6	35	6%	44%	8%	43%
546 Water transportation	253	136	216	126	90	-99	50%	-39%	36%	54%
578 Telephone	277	101	3	2	2	173	1%	62%	1%	36%
579 Telegraph	80	29	33	21	12	18	27%	22%	15%	36%
586 Electric light and power	108	41	1	1	1	67	0%	62%	0%	37%
587 Gas and steam supply systems	73	34	8	3	4	32	4%	43%	6%	46%
596 Water supply	36	17	3	2	2	15	5%	42%	4%	48%
597 Sanitary services	21	12	1		1	8	1%	37%	3%	59%
<b>WHOLESALE AND RETAIL TRADE</b>	<b>4893</b>	<b>2414</b>	<b>2191</b>	<b>1062</b>	<b>1129</b>	<b>288</b>	<b>22%</b>	<b>6%</b>	<b>23%</b>	<b>49%</b>
<b>Wholesale</b>	<b>865</b>	<b>386</b>	<b>366</b>	<b>226</b>	<b>140</b>	<b>113</b>	<b>26%</b>	<b>13%</b>	<b>16%</b>	<b>45%</b>
<b>Retail</b>	<b>4028</b>	<b>2028</b>	<b>1825</b>	<b>837</b>	<b>989</b>	<b>175</b>	<b>21%</b>	<b>4%</b>	<b>25%</b>	<b>50%</b>
636 Food stores, except dairy	905	488	437	197	240	-20	22%	-2%	26%	54%
637 Dairy prods stores and milk retailing	43	22	17	8	10	4	18%	9%	22%	51%
646 General merchandise	737	321	103	54	49	313	7%	42%	7%	44%
656 Apparel and accessories stores, except shoe	471	332	309	92	216	-170	20%	-36%	46%	71%
657 Shoe stores	70	39	252	143	109	-221	205%	-315%	155%	56%
658 Furniture and house furnishings stores	99	44	27	12	15	28	12%	28%	15%	45%
659 Household appliance and radio stores	21	10	2	1	1	9	6%	43%	3%	48%
667 Motor vehicles and accessories retailing	98	31	1		1	66	0%	67%	1%	32%
669 Drug stores	140	50	10	6	4	79	4%	57%	3%	36%
679 Eating and drinking places	409	219	203	73	130	-13	18%	-3%	32%	54%
686 Hardware and farm implement stores	138	53	11	6	4	74	5%	54%	3%	38%
687 Lumber and building material retailing	152	65	13	8	5	75	5%	49%	3%	42%
688 Liquor stores	6	5	17	4	13	-16	67%	-244%	201%	77%
689 Retail florists	12	7	1			5	1%	39%	3%	56%
696 Jewelry stores	63	32	4	1	3	26	2%	42%	4%	51%
697 Fuel and ice retailing	133	60	12	6	6	62	4%	46%	4%	45%
698 Misc retail stores	265	128	95	44	50	43	17%	16%	19%	48%
699 Not specified retail trade	237	112	313	178	135	-188	75%	-79%	57%	47%

<b>PRODUCER SERVICES</b>	<b>1648</b>	<b>712</b>	<b>467</b>	<b>322</b>	<b>145</b>	<b>469</b>	<b>20%</b>	<b>28%</b>	<b>9%</b>	<b>43%</b>
716 Banking and credit	285	105	42	32	10	139	11%	49%	4%	37%
726 Security and commodity brokerage and invest companies	88	37	34	26	9	17	29%	19%	10%	42%
736 Insurance	248	99	26	20	6	123	8%	49%	2%	40%
746 Real estate	224	96	27	20	7	101	9%	45%	3%	43%
806 Advertising	25	13	1	1		12	2%	47%	1%	50%
807 Accounting, auditing, and bookkeeping services	102	50	105	62	43	-52	61%	-52%	42%	49%
808 Misc business services	440	228	98	59	39	115	13%	26%	9%	52%
879 Legal services	145	50	109	86	23	-15	59%	-10%	16%	35%
898 Engineering and architectural services	83	31	25	16	8	28	20%	33%	10%	37%
<b>PERSONAL SERVICES</b>	<b>3830</b>	<b>1494</b>	<b>3098</b>	<b>1709</b>	<b>1389</b>	<b>-762</b>	<b>45%</b>	<b>-20%</b>	<b>36%</b>	<b>39%</b>
816 Auto repair services and garages	340	110								32%
817 Misc repair services	223	94	377	201	176	-248	90%	-111%	79%	42%
826 Private households	1719	591	1873	1066	807	-745	62%	-43%	47%	34%
836 Hotels and lodging places	504	215	161	94	66	128	19%	25%	13%	43%
846 Laundering, cleaning, and dyeing	203	93	95	45	50	16	22%	8%	25%	46%
847 Dressmaking shops	241	107	384	195	189	-250	81%	-104%	78%	45%
848 Shoe repair shops	75	54	4	2	2	17	3%	23%	2%	72%
849 Misc personal services	298	127	121	63	59	50	21%	17%	20%	42%
857 Theaters and motion pictures	114	49				65	0%	57%	0%	43%
858 Bowling alleys, and billiard and pool parlors	35	16	2	1	1	17	4%	49%	3%	45%
859 Misc entertainment and recreation services	77	38	81	41	39	-43	54%	-55%	51%	50%
<b>SOCIAL SERVICES</b>	<b>2767</b>	<b>995</b>	<b>944</b>	<b>689</b>	<b>255</b>	<b>827</b>	<b>25%</b>	<b>30%</b>	<b>9%</b>	<b>36%</b>
868 Medical and other health services, except hospitals	317	114	178	147	31	25	46%	8%	10%	36%
869 Hospitals	168	78	2	1	1	88	0%	52%	1%	46%
888 Educational services	972	291	397	303	94	285	31%	29%	10%	30%
896 Welfare and religious services	205	86	130	82	49	-11	40%	-6%	24%	42%
897 Nonprofit membership organizs.	39	15	2	1	1	22	4%	56%	1%	39%
899 Misc professional and related	34	17	18	12	6		35%	-1%	18%	48%
906 Postal service	216	69	41	31	9	106	15%	49%	4%	32%
916 Federal public administration	360	118	65	37	28	177	10%	49%	8%	33%
926 State public administration	30	10	8	5	3	12	17%	40%	9%	34%
936 Local public administration	427	198	105	70	34	124	16%	29%	8%	46%
Total Labor Force	40519	16286	27641	17894	9747	-3,408,570	44%	-8%	24%	40%
Total Labor Force minus Unknown and N/A	40300	16208	24092	15615	8477	0	39%	0%	21%	40%

Notes:

The 1920 expected "3rd and higher generation" labor force has two components

- 1) GROWTH --assuming that the expected 1920 population in each industry is based on the ratio of the 3rd and higher gen in 1920 over the 1880 total (all generations) in that industry
- 2) SHIFT -- the difference between the actual 1920 3rd and higher number in each industry and the expected based on (1)