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The Distribution of Relative Demand and Relative Supply Shocks for Managers Across the U.S. Economy

P. Michael KOSICEK★, Ramesh SONI★★, David YERGER★★★

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ABSTRACT

We construct relative wage and relative quantity employed measures for managers versus all other workers for 249 U.S. industries for 2002 and 2020 and then classify industries into four outcomes: a rise or fall in relative demand for managers, and a rise or fall in relative supply of managers. A rise in relative demand for managers is the least likely outcome to occur, but it has the highest average earnings for all other workers. Real earnings growth over this time for all other workers is strongest in the outcomes with a rising relative quantity employed of managers, suggesting managers and higher-skilled workers are more complements to, than substitutes for, each other. Service industries are more likely to have a rising relative demand for managers than goods industries. Industries in comparative advantage sectors are likely to have a higher relative quantity of managers than industries in disadvantage sectors.

1. Introduction

As is the case for other higher income economies, the U.S. labour market has experienced a multitude of shocks this century. As discussed in the Literature Review section of this paper, these shocks include, but are not limited to, ongoing shifts from goods to services production, technology shocks, offshoring of production to lower wage nations, the Great Recession of 2008-2009, and the global pandemic. A primary concern, and focus of much research, throughout these years has been the impact of these shocks upon wage and income inequality in the U.S. A smaller, but growing, body of research investigates more deeply the role of managerial intensity and quality in economic growth. In this paper we adopt a technique used for analysing labour market shocks' impact upon high-skilled versus low-skilled workers to investigate how the U.S. labour market for managers has been changing relative to all other workers. Our work contributes to the growing literature investigating the changing role of management in U.S. production.

We utilize an analytic perspective that has been widely applied in the analysis of changing market outcomes for high versus low-skilled workers in U.S. labor markets. In that literature, the standard supply-demand model is modified to use relative wages and relative quantities. Specifically, the relative wage for high-skilled workers is defined as the wage for high-skilled workers divided by the wage for low-skilled workers, and the relative quantity of high-skilled labor is defined as the number of high-skilled workers divided by the number of low-skilled workers. (Johnson, 1997). In our analysis, we compute at the detailed four-digit North American Industrial Classification System (NAICS) the relative wage for managers (RelW) and the relative quantity of managers employed (RelQ) annually from 2002 to 2020 for each of 249 industries. RelW is defined as the average wage for managers in that industry divided by the average wage for all other workers in that industry. RelQ is defined as the number of managers divided by the number of all other workers in that industry.

By tracking the changes in RelW and RelQ over time, we classify industries into one of four outcomes: (1) predominantly a rise in relative demand for managers, (2) predominantly a fall in relative demand for managers, (3) predominantly a rise in relative supply of managers, and (4) predominantly a fall in relative supply of managers. In addition to assessing the distribution of industries across these four outcomes, and their relative employment shares, we test for statistically significant differences across the four groups in their industries' growth rates of real earnings and of employment separately for both managers and all other workers. These findings provide some insights into linkages between managerial intensity and skill level of all other workers, as well as differences in real wage growth between industries in a comparative advantage versus a comparative disadvantage sector of the U.S. economy.

★Indiana University of Pennsylvania, USA, ★★Indiana University of Pennsylvania, USA, ★★★Indiana University of Pennsylvania, USA. E-mail addresses: P.M.Kosicek@iup.edu (P. M. Kosicek), Ramesh.Soni@iup.edu (R. Soni), yerger@iup.edu (Corresponding author – D. Yerger).

2. Literature review

This paper links to two different strands of research literature: (1) the analysis of causes of widening wage inequality in the U.S. labor market; and, (2) changes in the managerial intensity of production across industries in the U.S. and its implications. As noted in the introduction, our research method is motivated by work in the first research strand assessing the causes of the widening wage gap between higher and lower educated or skilled workers which focuses on the relative demand and/or relative supply of various worker types. A useful introduction is found in Johnson (1997). Here we present a few highlights of that literature in the subsequent years. Unless otherwise noted, all cited works utilized U.S. labor market data. Autor, Levy, and Murnane (2003) developed a model explaining 60% of the shift in relative demand from 1970 to 1998 towards college graduate workers and away from high school graduate workers as arising from increased use of computers. These results are extended by Cavenaile (2021) who finds changes over time in the importance of computerization and offshoring for explaining the wage gap by skill and education. From 1975 into the middle 1990's computerization had a larger impact, but from the middle 1990's to 2008 increased offshoring of production accounts for over 70% of widening wage inequality.

More recent research on the U.S. wage inequality has extended the focus on education differences across workers as an explanation to also include the impact of task differences across occupations; see Autor (2022) for a review of these developments. A key insight is that ongoing computerization is expanding the set of tasks for which a machine can substitute for labor. This rising computerization lowers demand for routine cognitive labour tasks and increases demand for nonroutine cognitive tasks. Given that more educated workers are more likely to be engaged in nonroutine cognitive tasks, it is not surprising that to date ongoing computerization has been a complement to higher educated workers and a substitute for less educated workers doing routine task (Acemoglu and Autor, 2011; Acemoglu and Restreppo, 2021; Deming, 2017).

Given that managers as a group typically are both more educated and more engaged in nonroutine cognitive tasks than the average non-manager worker, the above literature on wage inequality suggests that managers frequently should receive larger wage increases than non-manager workers. In the framework of this paper, this result shows as a rise in the relative wage for managers, RelW, in an industry from 2002 to 2020. A rising RelW is not a foregone conclusion, however, as many other shocks could be impacting a specific industry. In addition, there could be considerable variation across industries in the rate at which all other workers are improving their education and/or skills relative to the rate at which managers are improving their education and/or skills. If from 2002 to 2020 all other workers in an industry were improving on these measures faster than were managers, then it would be expected that RelW would decline.

Having established that the research literature provides valid reasons for finding either a rise or a fall in RelW across industries, we turn our attention to literature relevant for understanding the expected changes in managerial intensity, as measured by RelQ, from 2002 to 2020. This literature relates to the expressed need for additional analysis on managers' roles in the production process (Roberts, 2018). The development of firm-specific and cross-national data sets such as The World Management Survey (Bloom and Van Reenen, 2007) allow researchers to examine variation in the usage of specified management practices across firms and its impact upon firms' performance. The sizable variation across nations in their managers' use of designated quality management practices, such as six sigma and lean manufacturing, is shown to correlate well with nations per-capita GDP (Bloom et al, 2014). Using a variety of approaches and variables to proxy for workers' skills, several researchers have identified strong evidence that management best practices and a skilled workforce are complements to each other (Feng and Valero, 2020; Bender et al, 2018; Bloom et al, 2016; Roberts, 2007).

Along with improved management practices, more intense usage of managers also can enhance a firm's productivity via several mechanisms. More intense usage of middle management enhances workforce monitoring, and improves firm-wide coordination of production processes, allowing for larger scale economies to be captured. In addition, higher levels of management usage can permit greater labor specialization amongst the firm's workforce and can improve knowledge transmission and decision-making across the firm's management structure (Garicano and Rossi-Hansberg, 2006; Becker and Murphy, 1992). These actions can also raise a firm's productivity.

As just reviewed, there are multiple pathways by which higher managerial intensity, higher RelQ in this study, can lead to higher productivity so it is reasonable to expect many industries to show an increase in Rel Q from 2002 to 2020. It is not a foregone conclusion, however, that RelQ must be rising for an industry over this time period as other literature identifies reasons for why firms may elect to reduce their managerial intensity, leading to a decline in RelQ in our framework. Some researchers claim the U.S. economy has suffered from too many management levels in firms, implying that reducing managerial intensity would enhance profits (Hamel & Zanini, 2016). Others have claimed management's genuine contribution to the firm does not exceed their compensation (Leicht and Brady, 2011; Perelman, 2011; Harford, 2006), again implying benefits to firms from reducing their RelQ. Firms with these views are likely to reduce their RelQ. Another pathway which can lead to a reduction in RelQ is that firms can overemphasize short-run growth in profits which leads to inefficiently large reductions in managers and harms long-run profitability (Goesaert, Heinz and Venormelingen, 2015; Sucher and Gupta, 2018). In sum, there exists multiple valid reasons for any given

industry in our sample to experience either a rise or fall in RelW, and either a rise or fall in RelQ, from 2002 to 2020. As explained in the Methods section, we utilize a relative demand and relative supply framework which provides an intuitive classification system for the changes in RelW and RelQ across the sample's 249 industries.

3. Methods

3.1 Data Construction

The Occupational Employment and Wage Statistics program (OEWS, 2022) within the U.S. Bureau of Labor Statistics provides annual average wage and employment data for several hundred occupations. By careful matching across years, we construct a sample of 249 four-digit NAIC industries covering 2002-2020 with data for RelW and RelQ in each year. Our sample provides quite high coverage of the U.S. labor market. The sample's total employment of 127.2 million in 2002 captures 97.4% of U.S. total nonfarm average monthly employment of 130.6 million in 2002. In 2020, the sample's total employment of 139.1 million accounts for 97.8% of U.S. total nonfarm average monthly employment of 142.2 million. We can be confident that our findings are consistent with the underlying actual outcomes in the U.S.

For each year and industry, we compute the relative wage for managers as Rel W = average wage for managers / average wage for all other workers. Similarly, the relative quantity of managers is computed as Rel Q = number of managers employed / number of all other workers.

Borrowing from the literature comparing relative changes for high-skilled versus low-skilled workers (Johnson, 1997), we next modify the standard supply-demand diagram, see Figure 1 below, to reflect the relative wage and relative quantity for managers in an industry. Taking the 2002 outcome for an industry as being represented by the shown equilibrium in Figure 1 with RelW = W_0 and RelQ = Q_0, there are four types of market change outcomes possible when comparing 2002 against 2020:

i. A rise in relative demand (right shift of demand curve) for managers which leads to a rising relative wage for, and rising relative quantity of, managers. So, 2020 RelW > W_0 and RelQ > Q_0

ii. A fall in relative demand (left shift of demand curve) for managers which leads to a falling relative wage for, and falling relative quantity of, managers. So, 2020 RelW < W_0 and RelQ < Q_0

iii. A rise in relative supply (right shift of supply curve) for managers which leads to a falling relative wage for, and rising relative quantity of, managers. So, 2020 RelW < W_0 and RelQ > Q_0

iv. A fall in relative supply (left shift of supply curve) for managers which leads to a rising relative wage for, and falling relative quantity of, managers. So, 2020 RelW > W_0 and RelQ < Q_0

Of course, more than one shock can be impacting an industry in the same time period of analysis, but classifying each industry into one of these four categories identifies the net impact across all shocks.

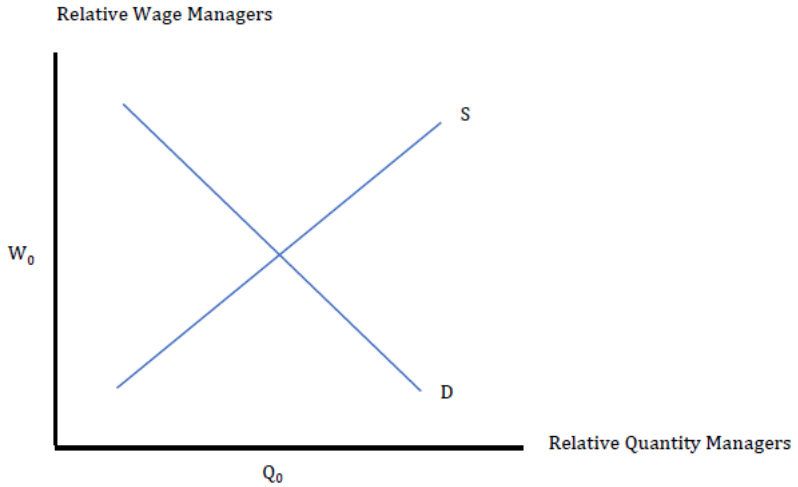

Figure 1. Determination of Relative Wage for and Relative Quantity of Managers Versus All Other Workers

3.2 Research Questions

We investigate the ten research hypotheses listed below. The results shed light on both the frequency of occurrence for the four types of market outcomes- a rise in relative demand for managers, a fall in relative demand for managers, a rise in relative supply of managers, and a fall in relative supply of managers- as well as linkages between likely skill levels of all other workers in an industry and the industry's managerial intensity or its RelQ value.

H1: There is no difference across the four market outcomes in the likelihood a four-digit NAIC industry has that outcome.

H2: There is no difference across the four market outcomes in their aggregate employment levels in either 2002 or 2020.

H3: There is no difference across the four market outcomes in real earnings for all other workers in either 2002 or 2020.

H4: There is no difference across the four market outcomes in real earnings for managers in either 2002 or 2020.

H5: There is no difference across the four market outcomes in the percentage change in employment from 2002 to 2020 for all other workers.

H6: There is no difference across the four market outcomes in the percentage change in employment from 2002 to 2020 for managers.

H7: There is no difference across the four market outcomes in the percentage change in real earnings from 2002 to 2020 for all other workers.

H8: There is no difference across the four market outcomes in the percentage change in real earnings from 2002 to 2020 for managers.

H9: There is no difference in the distribution of four-digit NAIC industries across market outcomes by sector.

H10: There is no difference in the managerial intensity, measured as RelQ, for industries in comparative advantage sectors of the economy as compared to industries in comparative disadvantage sectors of the economy.

4. Results and Discussion

4.1 Investigating H1 and H2

As seen in Table 1, there are fewer industries with the rise in relative demand for managers outcome (n = 41) and relatively more industries in both the rise and fall in relative supplies outcomes (n = 73, n = 71). When the tests of equal proportions in industry counts is run, the rise in relative demand for managers outcome is the only one of the four outcomes for which the null hypothesis that the proportion of the outcomes = 0.25, or hypothesized n = 249/4 = 62.25, is rejected (n = 41, p =.002). None of the other three outcomes are significantly different from the null proportion = 0.25, or n = 62.5, at the at the 90% level: fall in relative demand (n = 64, p-value = 0.800), rise in relative supply (n = 73, p-value = 0.116), and fall in relative supply (n = 71, p-value = 0.200) all fail to reject the null of equal proportion.

Tests were run with the null of equal proportions between the rise in relative demand for managers outcome and each the other three outcomes. Testing equal proportions for rise in relative demand versus fall in relative demand (p = 0.012), versus rise in relative supply (p = 0.001), and versus fall in relative supply (p = 0.001) rejects the null of equal proportions in each case. In contrast, every possible pairwise test of equal proportion between fall in relative demand, rise in relative supply, and fall in relative supply outcomes were run and in no cases was the null of equal proportions rejected.

On an industry count basis, we reject Hypothesis 1 as the rise in relative demand for managers outcome is statistically less frequent than the other outcomes.

Regarding Hypothesis 2, that there is no difference in total employment across the four market outcomes, we see in Table 1 that while there are differences in the shares of total employment across the market outcomes, these differences are smaller than for the industry counts as the shares of total employment for the market outcomes only vary between 21.6% and 30.1%. In addition, there is some convergence from 2002 to 2020 in employment shares across the four market outcomes. We compute a dispersion measure as the sum of the absolute values of each market outcome's employment share – 25%. In 2002, this dispersion measure equals |21.6-25| + |23.8-25| + |30.1-25| + |24.5-25| = 10.2. For 2020 the measure declines by approximately one-third as it now equals |22.3-25| + |24.2-25| + |28.4-25| + |25-25| = 6.9.

We reject Hypothesis 2, equal employment shares across market outcomes, but note total employment outcomes are more equal than the industry counts and show evidence of convergence.

Table 1. Industry Count and Total Employment Outcomes by Type of Market Outcome

				Percentage Shares	
	Industry	2002 Total	2020 Total	2002 Total	2020 Total
Market Outcome	Count	Employment	Employment	Employment	Employment
Rise Relative Demand Managers	41	27,465,670	31,050,390	21.6%	22.3%
Fall Relative Demand Managers	64	30,225,250	33,644,770	23.8%	24.2%
Rise Relative Supply Managers	73	38,309,570	39,566,950	30.1%	28.4%
Fall Relative Supply Managers	71	31,206,550	34,837,430	24.5%	25.0%
Total	249	127,207,040	139,099,540	100.0%	100.0%

4.2 Investigating H3and H4

As can be seen in Table 2, there is noticeable variation in real earnings across the four types of market outcomes for both managers and for all other workers in both 2002 and 2020. For example, in 2002 the average earnings for a manager across the 71 industries with the Fall in Relative Supply of Managers outcome is only $104,079 while for the 73 industries with the Rise in Relative Supply of Managers outcome real earnings in 2020 average $123,803. Similarly, for 2002 average earnings for all other workers range from $42,291 to $55,234. The variation in real earnings for both managers and all other workers in 2020 is similar to 2002. As seen in the quite small p-value, the null hypothesis of equal average earnings for managers across the four market outcomes in 2002 is strongly rejected. Likewise, the null of equal average earnings for all other workers across the four types of market outcomes is strongly rejected. The same findings hold for 2020 for both managers and all other workers.

Hypothesis 3 is strongly rejected, there is significant variation in real earnings across the four market outcomes for all other workers in 2002 and again in 2020.

Hypothesis 4 is strongly rejected, there is significant variation in real earnings across the four market outcomes for managers in 2002 and again in 2020.

Table 2. Average Real Earnings Across Industries by Type of Market Outcome

		2002 Real Earnings			2020 Real Earnings	
	Count	Managers	All Others		Managers	All Others
Rise Relative Demand Managers	41	$116,466	$55,234		$132,131	$60,416
Fall Relative Demand Managers	64	$110,207	$43,339		$111,538	$47,043
Rise Relative Supply Managers	73	$123,803	$50,819		$129,029	$58,458
Fall Relative Supply Managers	71	$104,079	$42,291		$115,352	$43,977
Total	249	$113,476	$47,192		$121,144	$51,717
F-stat		11.25	13.28		9.55	18.63
p-value		< 0.0001	< 0.0001		< 0.0001	< 0.0001
Note: all earnings in 2020 $, CPI adjusted						

4.3 Investigating H5 to H8

Turning to Table 3, the average percentage change in real earnings for managers from 2002 to 2020 was the lowest in the Fall in Relative Demand for Managers outcome at just 1.1% while it was the largest in the Rise in Relative Demand for Managers outcome at 14.5%. The test of equal percentage change in average real earnings for managers across the four market outcomes was strongly rejected ($p < .0001$). Similarly, the test of equal percentage change in average real earnings for all other workers across the four market outcomes was strongly rejected ($p < .0001$). Average real earnings growth for all other workers varied from a

low of 4.5% for industries in the Fall in Relative Supply of Managers outcome to 14.8% in the Rise in Relative Supply of Managers outcome.

Hypothesis 7 is strongly rejected, there is significant variation across the four market outcomes in the percentage change in real earnings from 2002 to 2020 for all other workers.

Hypothesis 8 is strongly rejected, there is significant variation across the four market outcomes in the percentage change in real earnings from 2002 to 2020 for managers.

Examining the employment growth data, we see that there is notable variation in employment growth rates for managers across the four market outcomes as the null hypothesis of equal employment growth was rejected (p = 0.031). Average employment growth for managers ranged from a decline of 14.0% in the Fall in Relative Supply of Managers outcome to a gain of 32.1% in the Rise in Relative Supply of Managers outcome. Unlike the prior three outcomes reported in Table 3, however, there is no statistically significant difference in the employment growth rates for all other workers. The null hypothesis of equal employment growth rates across the four market outcomes for all other workers is not rejected, nor is it close to statistical significance (p = 0.509).

Hypothesis 5 is not rejected, there is no statistically significant variation across the four market outcomes in the percentage change in employment from 2002 to 2020 for all other workers.

Hypothesis 6 is rejected, there is statistically significant variation across the four market outcomes in the percentage change in employment from 2002 to 2020 for managers.

Table 3. Average % Change Real Earnings and Employment Across Industries by Type of Market Outcome

		2002 to 2020			2002 to 2020	
		% Change Real Earnings			% Change Employment	
	Count	Managers	All Others		Managers	All Others
Rise Relative Demand	41	14.5%	10.0%		29.9%	13.4%
Fall Relative Demand	64	1.1%	8.5%		-8.6%	6.7%
Rise Relative Supply	73	3.6%	14.8%		32.1%	-2.3%
Fall Relative Supply	71	11.8%	4.5%		-14.0%	10.1%
Total	249	7.1%	9.5%		8.1%	6.1%
F-stat		17.09	11.69		3.01	0.78
p-value		< 0.0001	< 0.0001		0.031	0.5086

4.4 Investigating H9

Table 4 shows the classifications of each of the 249 4-digit NAIC industries by their 1-digit economic sector classification and the type of market outcome for that industry. The top half of the table shows the actual industry counts. For example, for the 18 4-digit NAIC industries in Sector 2- Mining, Utilities, and Construction- none of the industries were in the Rise in Relative Demand for Managers outcome, five were in the Fall in Relative Demand for Managers outcome, 12 were in the Rise in Relative Supply of Managers outcome, and one was in the Fall in Relative Supply of Managers outcome. The other rows are interpreted the same. Reviewing the top half of the table suggests that the 4-digit NAIC industries are not distributed the same way across the four market outcomes in each sector.

To gain further insights into the differences by sector in the distribution of industries across market outcomes, we computed the ratios shown in the bottom half of Table 4. Not shown in Table 4 are the computed expected number of industries by sector and outcome. For example, since there were 41 of 249 industries in the Rise in Relative Demand for Managers outcome and there were 25 industries in the Education and Health Care sector, the expected number of industries in that sector to be in the Rise in Relative Demand for Managers outcome would be (41/249) * 25 = 4.12. Since the actual number of industries for that outcome was six, the ratio of actual to expected is 6/4.12 = 1.46 which is the reported value in the table. The other reported values for the ratio of actual to expected number of industries were calculated in the same manner. It is evident that the industries within each sector are not similarly distributed across the four market outcomes. In total there are 36 reported ratios. If we take a reported ratio of less than or equal to

0.70 or greater than or equal to 1.30 as a notable departure from expected outcomes, then 22 of the 36 reported ratios are notably different than 1.0.

Hypothesis 9 is rejected, there are difference in the distribution of four-digit NAIC industries across market outcome by sector.

Table 4. Distribution of 4-Digit NAIC Industries by Economic Sector and Type of Market Outcome

Actual Outcomes: # industries by Sector	Managers Rise Relative Demand	Managers Fall Relative Demand	Managers Rise Relative Supply	Managers Fall Relative Supply	Total
1 Ag, Forest, Fishing		1		2	3
2 Mining, Utilities, Construction		5	12	1	18
3 Manufacturing	6	15	23	25	69
4 Trade, Transport, Warehousing	9	18	13	21	61
5 Info, FIRE, Professional Services	9	13	15	5	42
6 Education, Health Care	6	4	4	11	25
7 Arts, Recreation, Hospitality	4	4	3	4	15
8 Other Services	5	4	2	2	13
9 Public Administration	2		1		3
Total	41	64	73	71	249
Ratio Actual/Expected Outcomes					
1 Ag, Forest, Fishing	0.00	1.30	0.00	2.34	
2 Mining, Utilities, Construction	0.00	1.08	2.27	0.19	
3 Manufacturing	0.53	0.85	1.14	1.27	
4 Trade, Transport, Warehousing	0.90	1.15	0.73	1.21	
5 Info, FIRE, Professional Services	1.30	1.20	1.22	0.42	
6 Education, Health Care	1.46	0.62	0.55	1.54	
7 Arts, Recreation, Hospitality	1.62	1.04	0.68	0.94	
8 Other Services	2.34	1.20	0.52	0.54	
9 Public Administration	4.05	0.00	1.14	0.00	

4.4 Investigating H10

Although there is no direct test for comparative advantage, or disadvantage, that can be applied to any specific industry in this data set, some useful inferences still can be drawn from the presented information. First, we note that is very well established that higher wages correlate strongly in U.S. labour markets with higher levels of skill and education embedded in workers. Next, we note it is also widely accepted that comparative advantage industries within the U.S. are typically those industries making more intensive use of higher-skilled and/or more educated workers and that the comparative disadvantage industries hit hardest by globalization and automation make greater use of lower human capital workers (Kemeny, et al, 2015).

Reviewing again Table 2, we find that the average wage for all other workers in industries classified in both the Fall in Relative Demand for Managers and the Fall in Relative Supply of Managers outcomes are well below the average wage for all other workers in the other two market outcome categories. Given the well-established linkage between average wages and workers' skills and/or education, it is quite likely that industries using lower skilled or educated workers are more likely to be found in the Fall in Relative Demand for Managers or Fall in Relative Supply of Managers outcomes. Since industries more heavily using less skilled or educated workers are more likely to be comparative disadvantage industries in the U.S., we can say that comparative disadvantage industries are more likely located in these two market outcomes. It is worth noting that these two market outcomes both have a decline in the relative quantity of managers, RelQ, from 2002 to 2020.

Hypothesis 10 is rejected, there likely are differences in the managerial intensity, measured as RelQ, for industries in comparative advantage sectors of the economy as compared to industries in comparative disadvantage sectors of the economy.

5. Conclusions

In the USA from 2002 to 2020 the distribution across industries of relative demand and relative supply shocks for managers versus all other workers were not evenly distributed. The least likely outcome for an industry was a rise in the relative demand for managers over this time. No significant differences were found in the frequency of outcomes across industries for the other three types of market outcomes: fall in relative demand for managers, rise in relative supply of managers, and fall in relative of supply of managers.

Substantive differences were found across the four market outcomes for both the average real earnings of managers and the average real earnings of all other workers. In both 2002 and 2020, the rise in relative demand for managers and rise in relative supply of managers market outcomes had the highest average earnings for all other workers in an industry. It is noteworthy that these two market outcomes have a rising relative quantity of managers, RelQ, from 2002 to 2020 while the other two types of market outcomes- a fall in relative demand for managers and a fall in relative supply of managers- have a declining RelQ over this time. In addition, the two market outcomes with rising RelQ had higher growth rate of real earnings for all other workers in an industry than did the two market outcomes with declining RelQ. Higher wages and faster wage growth for all other workers in an industry positively associates with rising managerial intensity in an industry.

A rising share of managers in an industry's total employment is likely to associate with stronger growth in real earnings for non-management workers in the industry. Since earnings are known to rise with the embedded skills and education of a workforce, this is more evidence supportive of the view that managers and higher-skilled workers are complements to each other more than substitutes for each other. Given that industries with higher-skilled workers are more likely to be in the comparative advantage sectors of the U.S. economy, our findings also indicate that higher managerial intensity, as measured by RelQ, is more likely to be found in industries within comparative advantage sectors of the U.S. economy than in comparative disadvantage sectors.

The final finding to highlight is that while the rising relative demand for managers outcome was the least likely to occur, this outcome was much more likely to happen for industries in services production rather than goods production. As seen in Table 4, the services sectors (#5 through #9) have actual number of industries 1.3 to 4.05 times higher than their expected number of industries for the rise in relative demand for managers outcome. The ongoing shift in the U.S. economy from employment in goods production to employment in services production is likely to continue to increase the demand for managers.

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