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# *Worker Turnover in the 1920s: What Labor-Supply Arguments Don't Tell Us*

LAURA J. OWEN

This article investigates the decline in turnover of manufacturing workers in the United States that occurred in the 1920s. Three labor-supply explanations are evaluated using aggregate data on manufacturing workers and case studies of four manufacturing firms. The labor-supply analysis does not yield a satisfying explanation of the decline in quit rates of manufacturing workers. The suggestion is made that an examination of firms' employment policies is necessary to explain why workers were quitting their jobs less frequently.

**I**n the 1920s turnover rates of American manufacturing workers fell substantially. Annual separation rates (that is, quits, layoffs, and discharges per 100 employees) declined from 123.4 in 1920 to 37.1 in 1928.<sup>1</sup> These lower turnover rates have continued during the post-World War II era, with annual separation rates ranging from a low of 47 to a high of 64 per 100 employees between 1950 and 1970.<sup>2</sup> During the 1910s and the 1920s, quits accounted for over 70 percent of all separations, and the primary cause of the decline in total separations during the 1920s was a decline in quit rates.<sup>3</sup> Thus, an understanding of the decrease in worker-initiated separations (quits) is crucial to the analysis of the aggregate decline in labor turnover (Figure 1).

During the first two decades of the twentieth century, high rates of labor turnover were common in many industrial labor markets in the United States.<sup>4</sup> Several investigations of labor turnover suggest that these high

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<sup>1</sup> Berridge, "Labor Turnover."

<sup>2</sup> U.S. Bureau of the Census, *Historical Statistics*.

<sup>3</sup> Brissenden and Frankel, "Mobility"; and Berridge, "Labor Turnover." Because of the importance of quit rates in total separations and the highly procyclical nature of quit rates (as illustrated by Ross, "Do We Have?"), separation rates are also procyclical.

<sup>4</sup> Brissenden and Frankel's study ("Mobility") of labor mobility in U.S. industries during the 1910s produced separation rates ranging from a minimum of 62.7 in 1915 to a maximum of 150.7 in 1918, and averaging 117.2 for the decade as a whole.

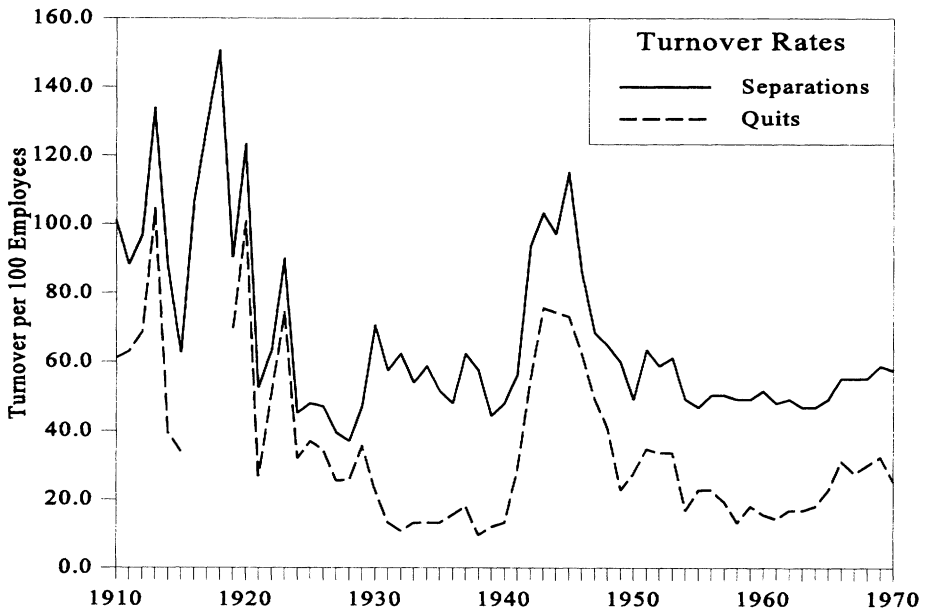


FIGURE 1

## ANNUAL TURNOVER RATES OF MANUFACTURING WORKERS, 1910–1970

Sources: For 1910 to 1918, Brissenden and Frankel, "Mobility"; for 1919 to 1929, Berridge, "Labor Turnover"; and for 1930 to 1970, U.S. Bureau of the Census, *Historical Statistics*. The data for 1919 to 1929 are median rates, whereas the data before and after that period are based on weighted averages. See Appendix 1 for a discussion of the comparability of these data.

rates were a reflection of a job-search process.<sup>5</sup> The absence of institutional arrangements encouraging worker loyalty and attachment to the firm contributed to the high rate of labor turnover. Because chances for upward mobility within the firm were few, workers primarily obtained better jobs by changing employers.<sup>6</sup> Paul Douglas found this lack of promotion possibilities to be a prominent cause of labor turnover, and noted that "work in one position rarely leads to a higher position. The workman, in any particular plant, relies therefore upon a change to some other plant to better his status."<sup>7</sup>

This high labor turnover has led some observers to characterize late

<sup>5</sup> "The dominant influence of length of service [on voluntary job changes] suggests the hypothesis that voluntary mobility is essentially a form of job shopping by workers" (Reynolds, *Structure*, p. 22). Carter and Savoca ("Labor Mobility") claimed that their findings do not support the notion of casual labor market attachments because high turnover rates do not translate into short job durations for the average worker. But high turnover rates did exist prior to the 1920s, even if only among a portion of the work force, and they did fall dramatically by the mid-1920s. Unfortunately, Carter and Savoca's methods of sampling cannot capture the very short-tenure workers, which may explain why they find "no relationship between job tenure and job-leaving probabilities" (p. 12).

<sup>6</sup> Jacoby, "Industrial Labor Mobility"; and Slichter, *Turnover*, p. 158.

<sup>7</sup> Douglas, "Problem," p. 312.

nineteenth- and early twentieth-century labor markets as “casual.”<sup>8</sup> However, the high rates of labor turnover that were common until the mid-1920s did not translate into short job tenure for *all* workers. The evidence indicates not that long-term employment was absent from nineteenth-century labor markets, but that it became more common in the twentieth century.<sup>9</sup> High turnover will not generate short job tenures for all workers if the turnover is concentrated in a certain group of workers.<sup>10</sup> If this high turnover group consists of workers still in search of a good job match, we can assume that they will pursue the search until it is successful or other factors increase the cost of continued switching.<sup>11</sup> The observed decline in turnover in the 1920s suggests a change in the search behavior of workers. An understanding of the causes of this change should provide an important clue as to why long-term employment relationships have become more commonplace in the twentieth century.

The question is then: why did workers begin quitting less frequently in the 1920s? The obvious starting point in search of an answer would be an examination of the factors that influenced the labor-supply decisions of workers. Sanford Jacoby claims that the decline in quit rates was a response to the slack labor market conditions of the 1920s.<sup>12</sup> Alternatively, increases in their relative wages might have provided the incentive for manufacturing workers to quit less often.<sup>13</sup> A third possibility is that new immigration policies might have changed the demographic characteristics of the population and produced a more stable work force.<sup>14</sup>

An alternative approach would be to focus on firms’ demand for labor.<sup>15</sup> The fixed costs of training workers increased in the 1920s as a result of the implementation of new technologies and changes in the legal environment in which firms operated. The technological changes led to increases in the firm specificity of the skills required of workers and in the cost of production disruptions, both of which increased training costs.<sup>16</sup> Legal changes in the area of industrial safety and liability also increased training costs for the firm.<sup>17</sup> Increases in the fixed costs of training workers

<sup>8</sup> Jacoby, “Industrial Labor Mobility”; and Slichter, *Turnover*.

<sup>9</sup> Carter, “Changing Importance”; Carter and Savoca, “Labor Mobility”; Hall, “Importance”; and Sundstrom, “Studies.”

<sup>10</sup> Slichter, *Turnover*, p. 43.

<sup>11</sup> Being married, having dependents, and owning a home reduced the probability of job exit in the nineteenth century and continue to do so today. See Carter and Savoca, “Labor Mobility,” for nineteenth-century evidence and a summary of twentieth-century findings.

<sup>12</sup> Jacoby, *Employing Bureaucracy*, p. 171.

<sup>13</sup> See, for example, Parsons, “Quit Rates.”

<sup>14</sup> Jacoby, *Employing Bureaucracy*, p. 276.

<sup>15</sup> Although a full development of this idea is beyond the scope of this article, a brief sketch of the labor-demand explanation of lower turnover follows. For a more complete analysis, see Owen, “Worker Turnover” and “Decline.”

<sup>16</sup> Doeringer and Piore, *Internal Labor Markets*; Edwards, *Contested Terrain*; Lazonick, “Technological Change”; Sabel, *Work*; and Sundstrom, “Internal Labor Markets.”

<sup>17</sup> Korman, *Industrialization*; and National Safety Council *Proceedings*.

provided the incentive for firms to reduce their labor turnover.<sup>18</sup> Firms responded to these incentives by implementing programs and employment policies (such as using tenure as a criterion in compensation, promotion, and layoff decisions) designed to increase the attachment between themselves and their employees.<sup>19</sup> If these employer-initiated actions increased the cost of quitting for workers, then workers would quit less frequently and turnover rates would decline.

Whether supply or demand forces were driving the decline in turnover is an empirical question. The remainder of this article examines the three labor-supply explanations of the decline in turnover that occurred in the 1920s.<sup>20</sup> Each argument is evaluated using the available aggregate data on manufacturing workers and then reexamined using the specific experiences of four manufacturing firms. What seemed to be the obvious starting point for this investigation (the labor-supply analysis) does not yield a satisfying explanation of the decline in quit rates of manufacturing workers. The inadequateness of the labor-supply approach leads to the suggestion that an examination of firms' employment decisions (the labor-demand element) and workers' reactions to them is necessary to explain why workers quit their jobs less frequently.

#### CASE STUDY ANALYSIS

The four case study firms are Scovill Manufacturing Company in Waterbury, Connecticut (a manufacturer of brass and other metal products), Sargent & Company in New Haven, Connecticut (a hardware and other metal products producer), Dwight Manufacturing Company in Chicopee, Massachusetts, and Suncook Mills in Suncook, New Hampshire (both cotton textile manufacturers).<sup>21</sup> These firms were selected for use in

<sup>18</sup> Oi, "Labor."

<sup>19</sup> In Ross's ("Do We Have?" p. 911) words, "the employer decided to decasualize the whole employment relationship and to incorporate system into it." See Owen, "Decline" for specific examples of changes in employment practices.

<sup>20</sup> A fourth possible explanation is that workers quit less often because the changes in consumption and debt accompanying the "Consumer Durables Revolution" of the 1920s (Olney, "Demand") increased the demand for income stability. For the indebted consumer, the risks associated with fluctuating income flows (and the inability to make payments) would increase the cost of quitting a job without first securing alternative employment. The impact of this risk on aggregate turnover rates depends on how widespread this type of debt was among manufacturing workers and whether workers suffered income interruptions by quitting into unemployment. Consumption patterns changed during the 1920s, particularly with regard to the consumption of durable goods associated with the electrification of household appliances and with the use of the automobile (Lebergott, *American Economy*), and consumer indebtedness increased substantially (Lebergott, *Americans*, p. 436). However, Slichter's (*Turnover*, p. 158) examination of turnover patterns of manufacturing workers does *not* suggest that quitting into unemployment was a common phenomenon before these changes in indebtedness occurred. More disaggregated information on the changes in the consumption patterns and indebtedness of manufacturing workers (as opposed to all consumers) and more specific evidence on the length of unemployment spells following quits are needed to fully evaluate whether a change in demand for income stability contributed to the decline in turnover in the 1920s.

<sup>21</sup> The Sargent & Company Records [hereafter SCR], are located at the Historical Manuscripts &

this analysis because of their size, their industry, and the availability of information on their labor turnover, worker tenure, company costs, work force compositions, and company policies.

All four companies experienced declines in the turnover of their work forces in the 1920s.<sup>22</sup> At Sargent, separation rates declined from over 100 in 1920 to less than 50 in 1927, closely following both the pattern and the level of the decline in turnover for all manufacturing workers.<sup>23</sup> The average separation rates of Scovill workers were 126 in 1920, 80 in 1921, 31 in 1923, and 46 in 1929/1930, with changes in the tenure distributions suggesting a decline in turnover after 1923 similar to the decline in aggregate turnover rates.<sup>24</sup> At Suncook Mills annual separation rates declined from over 300 in 1920 to 177 in 1927, with a pattern similar to (though higher in level than) the separation rates for all manufacturing workers.<sup>25</sup> Total separation rates at Dwight showed only a small decline between 1920 and 1926 (from 103 to 83), but quit rates declined substantially (from 86 to 39) over the same time period.<sup>26</sup> The largest part of this decline occurred between 1923 and 1924, similar to the pattern of decline in aggregate quit rates.

The similarity between the experiences of all four firms and the aggregate pattern suggests that the decline in turnover rates was the result of a common set of factors that an analysis of case studies may help to isolate. The existence of aggregate evidence consistent with the three labor-supply hypotheses I have discussed does not constitute a direct test of these explanations of microlevel behavior. Through case studies it is possible to assess the role that labor market conditions, relative wages, and work force composition played in the decline of labor turnover at a particular firm.<sup>27</sup> In addition, internal company records provide insight into the motivations behind the firm's management decisions that affected its labor turnover.

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Archives Division, University of Connecticut Libraries, Storrs, CT. The records used on Scovill Manufacturing Company, Dwight Manufacturing Company, and Suncook Mills are contained in the Scovill [hereafter, SMCC], Dwight [hereafter, DMCC], and Suncook [hereafter, SMC] Collections, Baker Library, Harvard University Graduate School of Business Administration, Boston, MA.

<sup>22</sup> Separation rates are calculated according to the basic formula:

$$\frac{\text{Number of Separating Workers}}{\text{Average Number on the Payroll}} \times 100$$

All rates are annualized by adjusting a weekly, monthly, or quarterly number of separations to an annual level.

<sup>23</sup> SCR, Total Employment Record, Series I, Box 7.

<sup>24</sup> The percentage of workers with less than one year of tenure fell from 45 percent in 1923 to 17 percent in 1928. SMCC, Employee Censuses, Case 36.

<sup>25</sup> SMC, Payroll Records, vols. 81–86, and Suspended Payroll Records, vols. 96–98.

<sup>26</sup> DMCC, Monthly Help Reports, Box MP-5, Folder 14, and Payroll Records, Cases HU-1 to HU-7.

<sup>27</sup> A panel data set on firms that included turnover rates, wages, work force compositions, and training costs would be ideal for this purpose. However, no such detailed data set on U.S. manufacturing firms in the 1920s exists.

TABLE 1  
COMPOSITION OF SEPARATION RATES, 1910–1928  
(rates per 100 employees)

Year	Total Separations	Discharges	Layoffs	Quits
1910	74.5	11.2	2.2	61.1
1911	89.5	17.4	9.0	63.1
1912	93.1	18.8	5.6	68.7
1913	138.3	23.8	9.9	104.6
1914	81.2	16.6	25.1	39.5
1915	53.6	8.8	10.8	34.0
1917–1918	183.5	24.8	14.4	144.3
1919	90.3	11.2	7.2	69.7
1920	123.4	12.8	9.7	100.9
1921	52.5	4.2	21.5	26.7
1922	63.5	8.0	4.5	51.0
1923	90.1	11.7	3.5	74.9
1924	45.2	6.3	7.0	32.0
1925	48.0	6.4	4.6	37.0
1926	47.1	6.6	6.1	34.4
1927	39.5	5.5	8.4	25.6
1928	37.1	4.8	6.5	25.8

*Notes:* Total separation rates are the sum of discharges, layoffs, and quits per 100 workers on the payroll. For 1910 to 1918, the breakdown of total separations into their components is based on the subsample of the firms in the Brissenden and Frankel study (“Mobility”) for which separation data were available in this form.

*Sources:* Data for 1910 to 1918 are from Brissenden and Frankel, “Mobility”; and for 1919 to 1928, they are from Berridge, “Labor Turnover.”

### SLACK LABOR MARKETS

Jacoby argues that the decline in quit rates after 1923 was a result of a “buyer’s market” in manufacturing labor, “in contrast to the seller’s market of 1916–20.”<sup>28</sup> Although labor market conditions during the decade of the 1920s were not as tight as those of the World War I boom, it does not automatically follow that the decline in quit rates during the 1920s was a cyclical response to slack labor demand. The fact that quit rates in the second half of the decade were lower than the rates prior to World War I remains unexplained (Table 1).

Two simple examinations of aggregate data indicate that the decline in turnover in the 1920s was not merely a reflection of the state of labor demand. First, the fluctuations in quit rates were much more dramatic between 1911 and 1915 (ranging from 34 to 105 per 100 employees) than between 1924 and 1928 (ranging from 26 to 37), even though the lower unemployment rates of the 1920s would have been expected to generate higher quit rates than those of the pre-war 1910s.<sup>29</sup> Second, annual accession rates (hires per 100 employees) also declined between 1920 and

<sup>28</sup> Jacoby, *Employing Bureaucracy*, p. 171.

<sup>29</sup> Brissenden and Frankel, “Mobility”; Berridge, “Labor Turnover”; and U.S. Bureau of the Census, *Historical Statistics*.

1928, from 121.6 to 44.5.<sup>30</sup> However, accession rates exceeded separation rates in six of the nine years, indicating that the decline in accessions was not the result of an attempt to reduce the size of the work force, but rather of a decrease in the number of hirings that were necessary due to the decline in separations.<sup>31</sup>

A more rigorous analysis of whether the decline in turnover after 1923 was a cyclical response to slack labor market conditions can be accomplished by employing a model of quit rate behavior.<sup>32</sup> This model assumes that workers will quit when an alternative wage in excess of the critical wage (the worker's current wage plus transfer costs) is offered. This assumption means that workers search on the job. The probability that a worker will quit depends on the number of job searches initiated and on the probability of receiving a wage offer greater than the critical wage. The reduced form of the model shows the quit rate to be a function of labor demand, wages, transfer costs, and search costs.

The model is estimated using first aggregate data on manufacturing workers and then firm-level data from the Dwight Manufacturing Company.<sup>33</sup> In the aggregate model the following variable definitions are used: an index of manufacturing employment as a measure of labor demand; the ratio of manufacturing to nonmanufacturing wages and the dispersion of manufacturing wages as the two wage measures; and the accession rate as a proxy for transfer costs (because as the number of new workers rises, transfer costs—which increase with tenure—decrease). The employment index, relative wage, wage dispersion, and accession rate variables are entered with a one-month lag to account for the time necessary for workers to respond to changes in labor market conditions, and search costs are a constant in the reduced form. A dummy variable, taking the value of one during the months of August and September and zero otherwise is included to capture what Donald Parsons refers to as the “vacation-school year effect” on worker mobility.<sup>34</sup>

Results of the estimations of the model are shown in the first two columns of Table 2. Column 1 presents the estimated coefficients of the model including a time trend. Column 2 presents the estimated coefficients of the model using a dummy variable taking the value of one after 1923. The largest observed decline in the raw turnover data occurs between 1923 and 1924. The 1923 dummy variable is included to test whether this decline remains significant after accounting for cyclical, wage and transfer cost effects. In both estimations the employment index has a positive and statistically significant influence on quit rates. Because the manufacturing

<sup>30</sup> Berridge, “Labor Turnover.”

<sup>31</sup> A similar relationship between separations and accessions existed in the 1910s, with accession rates exceeding separation rates in eight of the ten years. Brissenden and Frankel, “Mobility.”

<sup>32</sup> This model was developed by Parsons in “Quit Rates.”

<sup>33</sup> See Appendix 2 for variable descriptions and sources.

<sup>34</sup> Parsons, “Quit Rates,” p. 400.



TABLE 2  
MANUFACTURING WORKERS QUIT RATE REGRESSION RESULTS

	Estimated Coefficients <sup>a</sup> (standard errors)		Decomposition <sup>b</sup>			
			Mean <sup>c</sup>		(5) <sup>d</sup>	(6) <sup>d</sup>
			1920–1923	1926–1929		
	(1)	(2)	(3)	(4)		
Quit rate			50.90	28.5	–0.465 <sup>e</sup>	–0.465 <sup>e</sup>
Constant	16.622*** (3.943)	–14.143*** (3.824)				
Manufacturing employment	3.666*** (0.745)	3.124*** (0.685)	86.2	94.8	0.374	0.319
Relative wages	–5.305*** (1.521)	–3.843*** (1.469)	0.535	0.519	0.164	0.119
Wage dispersion	–0.056 (0.526)	–0.230 (0.499)	0.075	0.096	–0.014	–0.057
Summer dummy	0.281*** (0.056)	0.224*** (0.056)	0.171	0.171	0	0
Accession rate	0.236*** (0.093)	0.223*** (0.090)	78.1	46.6	–0.084	–0.079
Time trend	–0.012*** (0.003)		40.0	108.0	–0.816	
1923 dummy		–0.577*** (0.146)	0.0	1.0		–0.577
R <sup>2</sup> (adjusted)	0.834	0.833				
rho	0.672 (0.087)	0.671 (0.081)				

\*\*\* = significant at the 1 percent level.

<sup>a</sup> All variables are entered in natural log form, as the original derivation of the model suggests. The sample range is November 1920 through May 1929. Initial estimations of the model exhibited first-order serial correlation of the residuals. The results presented specify this autocorrelated error and were obtained using the Cochrane-Orcutt technique.

<sup>b</sup> The decomposition is of the decline in quit rates between 1920–1923 and 1926–1929.

<sup>c</sup> Values are actual (not logged) means.

<sup>d</sup> The change in means of logged values multiplied by the estimated coefficient equals the change in the log of the quit rate (attributable to each independent variable). Column 5 uses estimated coefficients from the equation with time trend, and column 6 uses estimated coefficients from the equation with 1923 dummy.

<sup>e</sup> Actual changes in the logs of quit rates.

Notes and Sources: See Appendix 2.

employment variable is used as a measure of labor demand, this result is evidence of the procyclical nature of quit rates. In both estimations the ratio of manufacturing to nonmanufacturing wages has a negative and statistically significant influence on quit rates. The negative coefficient is in accordance with the assumption that workers will be less likely to quit as their wages rise relative to wages in alternative employments.<sup>35</sup> A positive coefficient was expected for the dispersion of wages variable because as this dispersion increases, so do the opportunities to increase one's wage by

<sup>35</sup> The relative wage coefficients from the two estimations fall within the range of elasticities that Parsons ("Quit Rates," p. 399) estimated for 27 different manufacturing industries. The manufacturing employment (labor-demand) elasticities are slightly higher than those estimated by Parsons, suggesting that quit rates were more responsive to changes in labor demand in the 1920s than in the 1960s.

finding another job. The estimated coefficients for this variable are negative, but not statistically significant. The August-September dummy has a positive and statistically significant coefficient in both estimations, indicating that the “vacation-school year effect” was also operational in the 1920s. As expected, the estimated coefficients for the accession rate variable (included to capture the “new worker” effect on quit rates) are positive and statistically significant in both equations. The statistically significant negative coefficient on time trend in the first estimation shows that, after accounting for cyclical effects (labor demand), wage considerations, and transfer costs, there remains an unexplained downward trend in quit rates between 1920 and 1929. The statistically significant negative coefficient on the 1923 dummy in the second estimation reveals that, after accounting for these same factors, the level of quits was lower after 1923 than before. These results suggest that the decline in manufacturing worker quit rates during the 1920s was not merely a procyclical response to slack labor demand.<sup>36</sup>

A decomposition of the observed decline in quit rates is accomplished by first calculating the means of each independent variable (in log form) for the 1920 to 1923 and 1926 to 1929 time periods.<sup>37</sup> The difference in these means is then multiplied by the estimated coefficient to determine the change in the log of quit rates attributable to each independent variable (see Table 2). The manufacturing employment index increased from 86.2 to 94.8 between the two time periods, signifying stronger demand for labor. This increase should have contributed (according to the positive estimated coefficients) to a 0.319 to 0.374 *increase* in the log of quit rates between the two time periods.<sup>38</sup> The estimated coefficients on relative wages are negative and suggest that increases in the relative wages of manufacturing workers should lead to decreases in quit rates. However, between the 1920 to 1923 and the 1926 to 1929 time periods, relative wages of manufacturing workers fell by 3 percent, which should have contributed to a 0.119 to 0.164 *increase* in the log of quit rates. This decomposition reveals that though both labor demand and relative wages significantly influenced quit rates, changes in neither variable can explain the observed *decline* in quit rates in the 1920s. Changes in the wage dispersion and accession rate between the two time periods contribute to small declines in the log of quit rates (0.014 to 0.057 and 0.079 to 0.084, respectively). Consequently, most of the decline in quit rates is captured by the time trend or 1923 dummy variables, or left unexplained.

A closer examination of the decline in labor turnover at the Dwight

<sup>36</sup> Sundstrom (“Evolution”) came to a similar conclusion in his analysis of quit rates from 1911 to 1950: “This exercise reveals that the quit rate was substantially higher before the mid-1920s, by an amount that cannot be attributed to observable labor-market variables” (p. 150).

<sup>37</sup> The time trend and 1923 dummy are entered in linear form, so their actual (not logged) mean values are used in the decomposition.

<sup>38</sup> The log of quit rates actually *declined* 0.465 between the two time periods.

TABLE 3  
DWIGHT MANUFACTURING COMPANY QUIT RATE REGRESSION RESULTS

	Estimated Coefficients <sup>a</sup> (standard errors)		Decomposition <sup>b</sup>			
	(1)	(2)	Mean <sup>c</sup> 1920–1923 (3)	Mean <sup>c</sup> 1924–1926 (4)	(5) <sup>d</sup>	(6) <sup>d</sup>
Quit rate			76.2	44.1	–0.573 <sup>e</sup>	–0.573 <sup>e</sup>
Constant	2.481 (2.274)	2.350 (1.836)				
Accession rate	0.397*** (0.100)	0.369*** (0.096)	89.1	52.5	–0.148	–0.138
Relative wages	–0.333 (1.076)	–0.374 (1.048)	0.739	0.756	–0.008	–0.009
Wage dispersion	–0.120 (0.822)	–0.115 (0.687)	0.075	0.094	–0.028	–0.027
Inexperienced new hires	0.134* (0.090)	0.084 (0.095)	0.362	0.204	–0.091	–0.057
Time trend	–0.006* (0.004)		36.3	78.5	–0.253	
1923 dummy		–0.338** (0.179)	0.0	1.0		–0.338
R <sup>2</sup> (adjusted)	0.400	0.412				
Durbin Watson	1.920	1.933				

\* = significant at the 10 percent level.

\*\* = significant at the 5 percent level.

\*\*\* = significant at the 1 percent level.

<sup>a</sup> All variables are entered in natural log form, as the original derivation of the model suggests. The sample range is June 1920 to November 1926.

<sup>b</sup> The decomposition is of the decline in quit rates between 1920–1923 and 1924–1926.

<sup>c</sup> Values are actual (not logged) means.

<sup>d</sup> The change in means of logged values multiplied by the estimated coefficient equals the change in the log of the quit rate (attributable to each independent variable). Column 5 uses estimated coefficients from the equation with time trend, and column 6 uses estimated coefficients from the equation with 1923 dummy.

<sup>e</sup> Actual changes in logs of quit rates.

Notes and Sources: see Appendix 3.

Manufacturing Company can be accomplished using the available quit rate data on Dwight workers and the model of quit rate behavior employed in the previous analysis. The following variable definitions are used: monthly accession rates for manufacturing workers as the measure of labor demand; the ratio of Dwight wages to manufacturing wages and the dispersion of manufacturing wages; and the percentage of new hires who were inexperienced in the positions for which they were hired as a proxy for transfer costs.<sup>39</sup>

Results of the estimations of the model are presented in the first and second columns of Table 3. Column 1 presents the estimated coefficients of the model using a time trend. Column 2 presents the estimated coefficients of the model including a dummy variable that takes the value

<sup>39</sup> See Appendix 3 for variable descriptions and sources.

of zero through June 1923 and the value of one thereafter. In both estimations the hire rate for manufacturing workers has a positive and statistically significant influence on quit rates. This result is evidence of the previously described procyclicality of quit rates. The estimated coefficients for the relative wage variable are negative in both cases. These negative coefficients (though statistically insignificant) are in accordance with the expectation that as workers' wages rise in their current jobs, relative to wages obtainable in alternative employments, their propensity to quit declines. In both estimations the dispersion of manufacturing wages has a negative but not statistically significant influence on quit rates, though a positive coefficient was expected. The estimated coefficients for the variable measuring the percentage of inexperienced new hires is positive in both cases and statistically significant in the model with the time trend. The positive coefficients follow the expectation that quit rates will rise as inexperienced workers, who have lower transfer costs, comprise a larger proportion of total hires. The statistically significant negative coefficient on the time trend in column 1 shows that, after accounting for cyclical effects, relative wages, and transfer costs, there exists an unexplained downward trend in the quit rates of Dwight workers between 1920 and 1926. The statistically significant negative coefficient on the dummy variable in column 2 reveals that the quit rates of Dwight workers were systematically lower after 1923 than before and that this lower level cannot be attributed to cyclical or wage factors. These results suggest that the decline in the quit rates of Dwight workers (similar to the decline in aggregate quit rates) was not merely a procyclical response to slack labor demand.

A decomposition of the observed decline in quit rates at the Dwight Manufacturing Company between the 1920 to 1923 and 1924 to 1926 time periods is presented in Table 3.<sup>40</sup> This decomposition reveals that, of the two statistically significant variables, the decline in accession rates contributed to a 0.138 to 0.148 decline in the log of quit rates and the decline in inexperienced new hires contributed to a 0.057 to 0.091 decline in the log of quit rates; thus, both labor demand (accession rate) and transfer costs (inexperienced new hires) contributed to the decline in observed quit rates. However, a substantial portion of that decline is not explained by the search model and is, consequently, captured by the time trend or 1923 dummy variables or left unexplained.

#### INCREASES IN RELATIVE WAGES

From the estimated quit rate models we see that changes in relative wages do not explain the decline in turnover of either manufacturing workers in the aggregate or of workers at the Dwight Manufacturing

<sup>40</sup> This decomposition of the decline in quit rates at Dwight is conducted using the same method as in the decomposition of the decline in aggregate quit rates. The time periods of comparison are changed because the Dwight sample ends in 1926.

Company. Neither can wage patterns in the textile and metal-working industries and at the three other case study firms account for the causes of the observed decline in turnover. Real average hourly earnings in the metal-working industries followed a pattern similar to the wages of all manufacturing workers, leaving the relative wages of the workers in this industry unchanged over the decade. Real hourly earnings of textile workers fell slightly over the decade. These workers therefore suffered a decline in hourly earnings relative to all manufacturing workers.<sup>41</sup> Neither of these wage comparisons suggest that metal-working and textile workers were quitting less often due to increases in their wages relative to those available in alternative employments; rather the decline in the relative earnings of textile workers would predict just the opposite result.<sup>42</sup>

Real weekly earnings of workers at Scovill and Sargent increased at annual average rates of 3.4 percent and 4.1 percent, respectively, during the 1920s.<sup>43</sup> This increase was common to the hardware and small parts industry as a whole, so that earnings for Sargent and Scovill workers did not rise relative to their potential earnings at other firms in the same industry.<sup>44</sup> Workers at Suncook and Dwight experienced smaller increases in real weekly earnings (1.9 percent and 1.5 percent, respectively) during the 1920s.<sup>45</sup> Increases of this magnitude were common to the northern cotton textile industry, translating into no change in the relative earnings of workers at these two firms over the decade.<sup>46</sup> The decline in turnover experienced at these firms does not appear to have been driven by an increase in the earnings of their workers relative to potential earnings at other firms within the same industries.

#### COMPOSITIONAL CHANGES IN THE WORK FORCE

Jacoby argues that new immigrants, “without strong ties to a particular place” or employer, contributed heavily to the high aggregate turnover rates that were the norm prior to the 1920s. Consequently, the restrictions placed on European immigration in the 1920s contributed to the fall in

<sup>41</sup> Beney, *Wages*. Textile industry wages cover both cotton- and wool-mill workers, and metal-working industry wages cover workers in foundries and machine shops. Real wages in metal working increased from \$0.55 to \$0.61 per hour between 1920 and 1929, averaging between 3 percent and 5 percent above the wages of all manufacturing workers. Real hourly earnings of textile workers fell from just over \$0.47 per hour in 1920 to under \$0.46 per hour in 1929. (All wage series are expressed in 1923 dollars.)

<sup>42</sup> Although they are a preferable measure for comparison, average hourly wages are not available for all four of the case study firms. Thus, weekly earnings (primarily derived from payroll records) are used in the following analysis.

<sup>43</sup> Wage data for the two firms are from SCR, Series I, Box 7, and SMCC, vol. 294. Nominal weekly earnings were deflated by the Wage Earners' Goods Index developed in Williams et al., “Revision.”

<sup>44</sup> Beney, *Wages*. This industry is one of five components of the foundries and machine shops industry.

<sup>45</sup> Wage data for the two firms are from SMC, vols. 81–86, and DMCC, Cases HU-1 to HU-7. Nominal earnings were deflated by the Wage Earners' Goods Index from Williams et al., “Revision.”

<sup>46</sup> Beney, *Wages*. These earnings data are for northern textile workers only.

aggregate turnover rates.<sup>47</sup> Though specifically rooted in the events of the 1920s, this change-in-work-force-composition argument does not incorporate two important aspects of early twentieth-century immigration patterns.<sup>48</sup>

First, European immigrants often settled in areas where friends and family members had previously found work and were therefore not without ties to a particular place.

It is entirely safe to assert that letters from persons who have emigrated to friends at home have been the immediate cause of by far the greater part of the remarkable movement from Southern and Eastern Europe to the United States during the past twenty-five years. . . . Emigrants as a rule are practically assured that employment awaits them in America before they leave their homes for ports of embarkation.<sup>49</sup>

In the years covered by the Immigration Commission's study (1908 to 1910), only 5 to 8 percent of all immigrants were *not* joining relatives or friends.<sup>50</sup>

Second, the slower rates of migration from Europe were compensated for by increases in non-European immigration, particularly from Canada and Mexico, and by migration from the domestic agricultural to the industrial sector.<sup>51</sup> Total immigration slowed from 430,000 people in 1920 to 307,000 in 1928, with the proportion of immigrants from Canada and Mexico increasing from roughly 33 to 45 percent over the decade. Data on net domestic migration from farm to nonfarm sectors reveal that almost six million people left the farm sector between 1920 and 1929.<sup>52</sup> These groups (of non-European immigrants and former farm-sector workers) were also newcomers to U.S. industrial employment, with potentially higher rates of turnover because of lack of ties with a particular place or employer.<sup>53</sup>

<sup>47</sup> Jacoby (*Employing Bureaucracy*, pp. 5, 32, 276) claimed that both the reduction in the number of new immigrants and the decrease in return migration played a role in the decline in turnover.

<sup>48</sup> A third concern arises from an examination of the contribution of emigration to the rate of labor turnover. Jacoby (*Employing Bureaucracy*, p. 32) noted that emigration flows were countercyclical, and Hourwich (*Immigration*, p. 90) confirmed this with data on passenger movement from the United States to Europe during the first decade of the twentieth century. If return migration was contributing to the high rates of turnover before the 1920s, this would have introduced a countercyclical component into total separations. However, we know that the pattern of total separations was largely driven by procyclical quit rates and that it was the decline in quits that generated the decline in overall turnover rates in the 1920s. If emigration is countercyclical it would increase *following* periods of high layoffs rather than being the *cause* of increased quits. Conversely, emigration would decline in periods of rapid employment growth when quit rates tend to rise.

<sup>49</sup> U.S. Department of Labor, Bureau of Immigration, *Reports*, pp. 187–89, as quoted in Hourwich, *Immigration* pp. 93–94.

<sup>50</sup> Hourwich, *Immigration*, table 10, p. 94.

<sup>51</sup> Higham, *Strangers*; Jacoby, *Employing Bureaucracy*, p. 170; and Sundstrom, "Evolution."

<sup>52</sup> U.S. Bureau of the Census, *Historical Statistics*. The number of immigrants entering from Mexico is clearly underestimated because the official statistics on Mexican immigration count only legal immigrants. Illegal immigration from Mexico during the 1920s has been estimated at 40 to 200 percent of legal entries. Illegal immigration clearly increased after the implementation of a literacy test and an \$8 head tax in 1917 and following the imposition of a \$10 visa fee in 1924. Reisler, *Sweat*, appendix, pp. 265–73.

<sup>53</sup> Including total immigration in the quit rate regression (with a six-month lag to allow time for

Though Mexican workers often engaged in agricultural employment in the Southwest in the 1920s, increasing numbers were entering industrial employment in the Midwest.<sup>54</sup> Mark Reisler's analysis finds that "labor turnover for Mexicans was very high," because Mexican workers held unskilled, low-paying, arduous industrial jobs; because discrimination often meant they were the first to lose jobs during layoffs; and, most importantly, because most Mexican workers expected to return to Mexico.<sup>55</sup> Similarly high rates of return migration are suggested for Canadian workers in Isaac Hourwich's review of the *Reports of the Immigration Commission*. Looking at the iron and steel industry, he finds that 46 percent of Canadian workers made visits to their home country during the study period (1908 to 1910), whereas the rates for workers from various European countries ranged from 6 to 28 percent. It appears that their proximity to their home countries contributed to high rates of return migration for Canadian and Mexican workers.

At the firm level, the empirical question is whether the observed declines in turnover were associated with increases in the proportion of American-born workers. Data on the nationality of workers at Scovill and Dwight Manufacturing Companies offer little support for this explanation. Over the decade there was only a slight increase in the employment of American-born workers (and of workers who were American citizens) at the Scovill plant, with no significant shifts that would explain the large decline in turnover that occurred in the mid-1920s.<sup>56</sup> The decline in labor turnover at Dwight occurred even though the company continued to employ a predominantly immigrant work force (primarily from Poland and France) after the more restrictive immigration laws were passed.<sup>57</sup>

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"newcomers" to find and quit jobs) reveals no statistically significant relationship between the decline in immigration following the restrictions and the decline in quit rates of manufacturing workers. Even with the inclusion of this variable, a negative trend in quit rates persists and remains unexplained. (Monthly data on immigration is found in U.S. Department of Labor, *Annual Report*, volumes for the years 1919 through 1929, table 2, "Immigrant Aliens Admitted.")

<sup>54</sup> Industries employing Mexican workers in the 1920s included autos, steel, and meat packing. By 1930, 27 percent of Mexican workers in the United States were classified as industrial workers. See Reisler, *Sweat*, chap. 5, for additional details of the employment of Mexican immigrants in "Urban-Industrial America."

<sup>55</sup> The desire to return is seen in the small numbers of Mexican immigrants who became naturalized citizens. In 1920 only 4.8 percent of Mexican-born U.S. residents had gained citizenship. "Reliable information on the number of immigrants, legal or illegal, who eventually returned to Mexico is lacking. The United States Immigration Bureau did not record departures by land from the United States" (Reisler, *Sweat*, pp. 111, 266).

<sup>56</sup> The proportion of American-born workers in the Scovill work force increased from just under 50 percent in the early 1920s to 55 percent in 1929. The percentage of the Scovill employees who were American citizens (both native-born and naturalized) increased only slightly from 67 percent in 1921 to 69 percent in 1928. SMCC, Employee Censuses, Case 36.

<sup>57</sup> The limited data on the nationality of Dwight workers (for 1923 and 1924 only) indicate that most of them were immigrants, with only 3 percent being American-born. DMCC, Box MR-2, Folder 102.

## EMPLOYMENT POLICY CHANGES

Evaluation of the three labor-supply arguments does not yield a satisfying explanation of the decline in the quit rates of manufacturing workers in the 1920s. The labor-demand explanation of the decline in turnover suggests that quit rates declined as changes in the employment policies of firms altered workers' search behavior. Were firms attempting to reduce the turnover rates of their workers, and if so, what incentives led them to such attempts? Although a full development and test of this hypothesis is beyond the scope of this article, several examples from the experiences of the case study firms suggest that attempts to reduce turnover were being made as firms faced rising costs of labor turnover.<sup>58</sup>

The goal of reducing turnover is reflected in policies and programs that reward tenure with the firm, provide for internal promotion possibilities, and generally improve working conditions. Tenure was used as a criterion in both nonwage compensation and layoff decisions. In 1920, Scovill management authorized pensions of one-half pay for workers with over 25 years of service. Paid vacations, based on tenure with the firm, were also made available to Scovill employees.<sup>59</sup> Scovill's policy on layoffs during the 1921 recession favored retaining workers with dependents and those with longer tenure with the firm.<sup>60</sup>

Internal job ladders, and the intrafirm mobility that they promise, are a means by which a firm can elicit and reward the stable employment of its workers.<sup>61</sup> The centralization of hiring, firing, and transfer decisions in a separate employment department was the first step in establishing internal promotion possibilities at Sargent (1917), Scovill (1914), and Dwight (1919).<sup>62</sup> The centralization of employment functions in a separate department at these three firms meant that decisions were now made according to one set of company rules and standards, rather than on the personal biases of the individual foremen.<sup>63</sup> Centralization of these decisions also facilitated intrafirm transfers in response to the changing employment needs of each department.<sup>64</sup>

Improvement of the working and living conditions of their employees was the goal of an array of social and educational programs provided by the four case study firms during the 1910s and 1920s. The provision of company-owned or -constructed housing was an "improvement" in worker living conditions that explicitly tied the worker to the firm. Scovill,

<sup>58</sup> The following examples are from Owen, "Worker Turnover" and "Decline."

<sup>59</sup> SMCC, Case 34, Folder 10.

<sup>60</sup> SMCC, Case 33, Folder 19, and Case 34, Folder 11.

<sup>61</sup> Lazonick, "Technological Change"; and Sabel, *Work*.

<sup>62</sup> Unpublished history of Sargent & Company, "Combining the Iron Foundries," obtained through personal correspondence with Sargent & Company; SMCC, Case 36, Folder 7; and DMCC, Cases HU-3, 5, 6.

<sup>63</sup> Sundstrom, "Internal Labor Markets."

<sup>64</sup> In 1920, 1,745 Scovill workers (24 percent of the total work force) were involved in intrafirm transfers. SMCC, Case 33, Folder 46.



Suncook, and Dwight were all involved in providing housing for their employees in the 1920s.<sup>65</sup>

The implementation of the programs and policies designed to reduce labor turnover was a response to the increasing costs of turnover facing these four firms. As noted previously, the introduction of new production processes can increase a firm's training costs (and therefore the cost of labor turnover) by increasing the firm specificity of skill and by making production disruptions more costly. New technologies were being introduced at Sargent, Scovill, Suncook, and Dwight during the first three decades of the twentieth century. The director of training at Scovill suggests that the new skills required of workers were firm specific. "Every big factory has the proposition of men coming in who, while they may be skilled workmen, haven't had enough experience on your kind of work and need coaching and training."<sup>66</sup> As the new technologies increased the complexity of the production process and made disruptions more costly, the issues of worker loyalty and dependability were gaining importance. At Suncook the changes in technology were followed by the offering of a profit-sharing plan. To receive benefits under this plan employees were expected "to work steadily," "to be faithful in the performance of their duties," and to be "loyal to the Company's interest."<sup>67</sup>

In addition to being the first step in the establishment of internal promotion possibilities, the centralization of employment functions in a separate department enabled the firm to take direct action to control the elements of turnover that were *firm* initiated: layoffs and discharges. Dwight established its employment department in 1919, and their annualized discharge rate declined steadily from an average of 17 per 100 workers in 1919 to an average of 4 per 100 workers in 1926.<sup>68</sup>

### CONCLUSION

In considering the labor-supply decisions of workers, this article looked at three factors that may have caused workers to quit less often. Aggregate turnover data were employed to show that the decline in quit rates was not merely a procyclical response to slack labor demand, and case study evidence confirms this result. Industry and firm-level wage comparisons indicate that the decline in the turnover of manufacturing workers cannot be attributed to an increase in relative wages. Though new immigration policies produced compositional changes in the labor force, a correlation between these demographic changes and lower turnover rates cannot be substantiated with the aggregate or case study evidence.

<sup>65</sup> SMCC, Case 33, Folder 8; SMC, vol. 79; and DMCC, Box MP-5, Folders 1 and 10. Between 1925 and 1929, turnover of tenants in Suncook-owned housing was only 14 percent per year, well below the over 100 percent turnover rates of all Suncook Mill employees.

<sup>66</sup> Berry, "Reducing Production Costs," p. 15.

<sup>67</sup> SMC, Case 4, Folder 3.

<sup>68</sup> DMCC, Case MP-5, Folder 14.

In short, the decline in the quit rates of manufacturing workers in the 1920s cannot be fully explained (using aggregate or firm-level data) by the three labor-supply arguments. On the other hand, the case study evidence reveals that firms were making efforts to strengthen the attachment between themselves and their employees prior to the observed declines in turnover. To develop a complete picture of the decline in turnover of manufacturing workers and the change in search behavior it suggests, the labor-demand element of the issue (firm employment policies) must be fully explored.

## Appendixes

### APPENDIX 1: COMPARABILITY OF TURNOVER DATA IN FIGURE 1

The turnover data for the 1919 to 1928 period, taken from William Berridge, are not directly comparable to the data available for the 1910 to 1919 period, taken from Paul Brissenden and Emil Frankel, on three counts.<sup>69</sup> First, the earlier data were compiled as weighted averages of the rates of all firms surveyed, whereas the 1919 to 1928 data are medians. Jacoby claims that the 1919 to 1928 data are not representative because their calculation as medians of data on large firms with low turnover rates results in a downward bias in the rates.<sup>70</sup> But as Arthur Ross notes, if larger firms have lower turnover rates, medians will be higher than weighted averages.<sup>71</sup> The data for the one year covered by both studies (1919) confirm this difference: the median turnover rates from Berridge exceed the weighted average turnover rates from Brissenden and Frankel. Jacoby may have a valid point on the overrepresentation of large firms, but this is likely a problem in both studies. As Brissenden and Frankel suggested, the actual turnover of labor in manufacturing may have been much higher than their sample statistics suggest: "The establishments from which the Bureau of Labor Statistics has secured labor mobility figures have necessarily been the concerns which had the figures to give, that is to say, concerns which had given rather more attention than most firms to their force-maintenance problems. The firms reporting are chiefly concerns which had more or less centralized employment systems and were relatively more successful in the maintenance of a stable work force."<sup>72</sup>

The second issue is that the Brissenden and Frankel study covers workers in public utilities and mercantile establishments in addition to workers in manufacturing industries and is therefore not directly comparable to the later series on the turnover of manufacturing workers. However, the turnover rates of these nonmanufacturing workers were lower than those of manufacturing workers in both 1913/14 and 1917/18 (the two years for which industry-level data are available). Thus, comparisons of the data on the 1910s with the 1920s data may actually underestimate the decline in turnover.

Third, the rates for 1910 to 1919 were originally calculated per labor hour. The number of employees was estimated at one worker per 3,000 labor hours—the number of hours in a typical work year. This conversion generates the number of full-year workers, not allowing for any procyclicality of labor hours. If hours are procyclical, this calculation overstates

<sup>69</sup> Berridge, "Labor Turnover"; and Brissenden and Frankel, "Mobility."

<sup>70</sup> Jacoby, *Employing Bureaucracy*, p. 326.

<sup>71</sup> Ross, "Do We Have?"

<sup>72</sup> Brissenden and Frankel, "Mobility," p. 40.

(understates) the number of workers during an upswing (downswing), thus dampening the response of turnover rates to economic cycles.

APPENDIX 2: VARIABLE DESCRIPTIONS AND SOURCES FOR TABLE 2  
(MANUFACTURING WORKERS)

The quit rate and accession rate data are from Berridge.<sup>73</sup> The annualized quit rate and accession rate are calculated as

$$\frac{(\text{Number of Quits} [\text{Accessions}]) \times 12}{\text{Average Number of Employees on Payroll}} \times 100$$

The manufacturing employment, relative wages, and wage dispersion data are from M. Ada Beney.<sup>74</sup> Manufacturing employment is an index with base year 1923. Relative wages are calculated as the ratio of manufacturing to nonmanufacturing (building-trades) wages. James Long and Albert Link noted that inclusion of a wage variable creates a possible simultaneity problem, both because employers may link wages paid to the likelihood that a worker will quit and because employers may seek to control the level of quits through wage policies—choosing the wage-quit combination that minimizes their costs.<sup>75</sup> An alternative measure of relative wages is included in the actual estimation to avoid this problem. The alternative wage measure is an estimated value of the manufacturing to nonmanufacturing wage ratio derived from a regression of the current wage ratio on lagged values of the quit rate. If employers link wages to the likelihood of a worker's quitting, past quit behavior will inform these decisions. Wage dispersion is calculated as the standard deviation of wages in the 25 manufacturing industries included in the Beney study. The summer dummy takes the value of one during the months of August and September to capture what Parsons refers to as the "vacation-school year effect" on worker mobility. The 1923 dummy takes the value of zero from November 1920 to September 1923 and the value of one from October 1923 to May 1929.

APPENDIX 3: VARIABLE DESCRIPTIONS AND SOURCES FOR TABLE 3  
(DWIGHT MANUFACTURING COMPANY)

The quit rate and the inexperienced new hires are calculated from data contained in the Dwight Collection.<sup>76</sup> Quit rates are calculated as in Table 2, described previously. Inexperienced new hires is calculated as the percentage of new hires without experience in the position for which they were hired. Accession rate data are from Berridge, and accession rates are calculated as in Table 2.<sup>77</sup> Relative wages are the ratio of Dwight wages to manufacturing wages. Dwight wage data are derived from payroll data and wage distributions contained in the Dwight Collection.<sup>78</sup> Manufacturing wages and wage dispersion data are from Beney.<sup>79</sup> The 1923 dummy takes the value of zero from June 1920 to June 1923 and the value of one from July 1923 to November 1926.

<sup>73</sup> Berridge, "Labor Turnover."

<sup>74</sup> Beney, *Wages*.

<sup>75</sup> Long and Link, "Impact."

<sup>76</sup> DMCC, Monthly Help Reports, Box MP-5, Folder 14, and Payroll Records, Box HU-1 to HU-7, respectively.

<sup>77</sup> Berridge, "Labor Turnover."

<sup>78</sup> DMCC, Case HU 3,5,6 and Case HE-2.

<sup>79</sup> Beney, *Wages*.

APPENDIX TABLE 1  
MEANS AND STANDARD DEVIATIONS OF REGRESSION DATA

Variable	Mean	Standard Deviation
Quit rate		
Manufacturing <sup>a</sup>	38.2	20.3
Dwight <sup>b</sup>	59.5	29.6
Manufacturing employment <sup>a</sup>	92.1	8.3
Accession rate	59.6 <sup>a</sup>	30.7
	71.6 <sup>b</sup>	39.5
Relative wage		
Manufacturing/nonmanufacturing <sup>a</sup>	0.528	0.017
Dwight/manufacturing <sup>b</sup>	0.748	0.033
Wage dispersion	0.087 <sup>a</sup>	0.010
	0.084 <sup>b</sup>	0.010
Inexperienced new hires <sup>b</sup>	0.276	0.134

<sup>a</sup> Sample range for Manufacturing Workers model is November 1920 to June 1929.

<sup>b</sup> Sample range for Dwight Manufacturing Company model is June 1920 to November 1926.

Notes and Sources: see Appendixes 2 and 3.

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