

# The Growth of Union Decertification: A Test of Two Nonnested Theories

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This article tests two rival theories of the growth of union decertification: a neo-classical and an institutionalist. Both perform well when they are independently tested against the data. However, Cox nonnested hypothesis tests indicate that when these two theories are tested against each other, the institutionalist theory is superior to (i.e., variance encompasses) the neoclassical theory.

THE ADEQUATE TESTING OF A THEORY requires that it be tested against the data *and* against rival theories. Yet it has long been recognized that using the criterion of “best fit” to select among a set of theories is, in general, unlikely to lead to the selection of the “true” theory (Pesaran 1974; Lovell 1983). Therefore, a more rigorous standard has been proposed: a particular theory must “encompass” rival theories—that is, account for both the salient features of rival theories and additional phenomena not explained by these theories—before that theory is accepted (Mizon and Richard 1986).

Furthermore, Pesaran and Deaton (1978) have argued that inferences about the adequacy of any theory can only be made after it is tested against some rival *nonnested* theory. Theories are nonnested when neither theory can be generated by imposing restrictions on the other theory; such theories offer fundamentally different explanations for observed phenomena. A small, but growing, body of empirical work does formally test one non-nested economic theory against another seeking to identify the most pro-

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gressive direction for theory development. Cox tests and J tests have typically been used as encompassing tests in these studies.

This article tests two nonnested theories of the growth of union decertification in the postwar United States against each other. The two theories tested below were chosen because they each offer quite distinct explanations for the same phenomena (union decertification) and because both theories perform quite well when tested against the data. The testing of these two theories against each other should therefore provide a good test case for the empirical comparison of nonnested theories from the labor literature and should highlight the benefits of nonnested hypothesis tests.

Notably, the two theories tested against each other come from different research programs—neoclassical economics and institutionalist economics. Heretofore, the range of nonnested theories formally tested against one another in the economics literature has been quite narrow: one theory developed within the neoclassical research program has been tested against other theories developed from within the *same* research program (e.g., McAleer, Fisher, and Volker 1982; Bernanke, Bohn, and Reiss 1988). This article establishes that *interresearch* program theory comparisons are possible and that the limitation in the economics literature to comparisons of models generated solely within the neoclassical research program is artificial.

This article proceeds as follows: First, the growth of union decertification in the postwar United States is briefly discussed. Second, the neoclassical theory of union decertification is presented and tested. Third, the institutionalist theory of union decertification is presented and tested. Finally, Cox nonnested hypothesis tests are used to test these two theories against each other. It is shown that the institutionalist theory is superior to (i.e., variance encompasses) the neoclassical theory.

## The Growth of Union Decertification

The Taft-Hartley Act (1947) established an election process through which workers could decertify their union as their bargaining representative. Figure 1 presents data on the annual number of successful union decertifications in the United States. As can be seen, union decertifications were relatively infrequent over 1948–1970. After 1970 the pace of union decertification picked up markedly and union decertifications reached a peak in the early 1980s. During the ten years starting in 1979, unions lost 230,000 members through union decertification. The annual number of union decertifications has fallen in recent years, but the totals remain above those registered during the first two decades following passage of the Taft-Hartley Act.

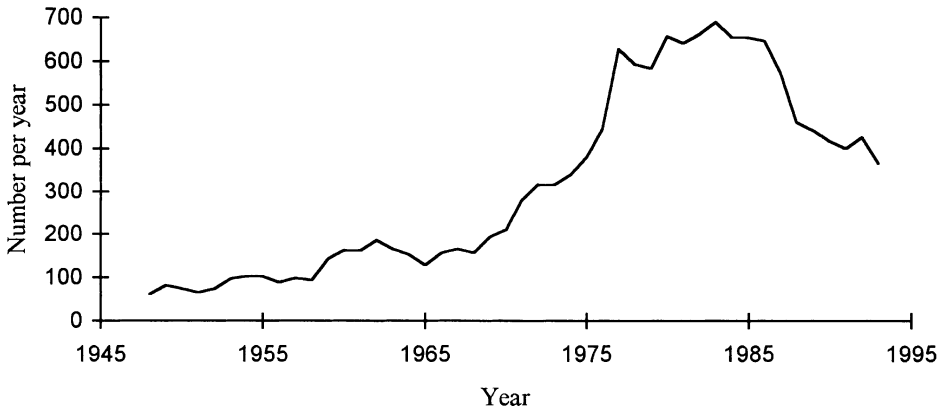


FIGURE 1  
Number of Union Decertifications, 1948-93

SOURCE: Annual Report of the National Labor Relations Board, various years.

Union decertifications have also grown in relative importance. Whereas during the 1950s and 1960s over twenty union certifications occurred per union decertification, in recent years less than four certifications have occurred per union decertification. Union decertification is an increasingly important phenomenon and an explanation for the growth of union decertification after 1970 should enhance our knowledge of the unionization process.

### The Neoclassical Theory of Union Decertification

Neoclassical theory gives close attention to how monetary costs and monetary benefits shape individual decision making. Yet, this theory also takes account of social, political, and institutional factors. Social forces (e.g., social approval/disapproval) are seen to shape the benefits and costs faced by decision makers no less than do narrow monetary factors. Political and institutional factors (e.g., legislation) can also play a part in determining the costs and benefits faced by economic actors by establishing rewards and penalties for particular behaviors.

*Neoclassical theory of the growth of union decertification.* Anderson, O'Reilly, and Busman (1980) developed a neoclassical theory of the post-war growth of union decertification and subjected their theory to empirical testing. After reviewing their empirical work, Anderson, O'Reilly, and

Busman (hereafter, Anderson et al.) concluded that their model provided “a satisfactory and parsimonious explanation” of the growth of union decertification in the postwar period.

No other model of the temporal growth of union decertification has appeared in the neoclassical literature. And, according to the *Social Science Citation Index*, Anderson et al.’s 1980 article has been cited at least seventeen times since it was published, and none of the citing papers voiced criticism of Anderson et al.’s formation of the neoclassical theory or their empirical test of this theory. Absent an alternative source for the neoclassical model of union decertification and absent any published criticism of their model, I will use Anderson, O’Reilly, and Busman (1980) as the source for the neoclassical model of union decertification.

According to Anderson et al., union decertification occurs because—for the individual union member—the cost of union membership is greater than its benefit. The underlying determinants of the pace of union decertification are the multiplicity of economic, social, political, and institutional factors that determine the costs and benefits of union membership. (Anderson et al.’s model of union decertification follows closely Ashenfelter and Pencavel’s [1969] influential model of union growth.)

Union membership benefits workers when unions are able to protect the real wages of their members. During periods of increasing inflation, however, some union workers discover that their union is unable to “deliver the goods”: the protection of real wages. Rapid changes in prices should lead to an increased pace of union decertification (Anderson et al. 1980, p. 104). The speed of price changes is measured by the percentage change in the consumer price index,  $\Delta CPI$ .

The benefit of union membership grows when jobs become scarce and union workers become more appreciative of the employment protection clauses of collective bargaining agreements. Job scarcity should reduce the incidence of union decertification. The scarcity of jobs will be measured by the percentage change in employment,  $\Delta E$ : as  $\Delta E$  increases, jobs are less scarce and workers should be more likely to decertify their union. Following Ashenfelter and Pencavel (1969), Anderson et al. assume the union decertification is affected by a moving average of current and past values of  $\Delta E$ .

Unions, however, are not always able to provide this employment security. During recessions, some unions are unable to protect the jobs of their members and some union members find themselves subjected to lengthy layoffs. These layoffs will lead to the perception that unions are unable to deliver the goods, in this case, employment security. The magnitude of this perception will depend on the depth of the recession and

the length of time since the last recession (as workers see past union failures as being less relevant to current conditions). Following Ashenfelter and Pencavel (1969), Anderson et al. use the following measure of worker displeasure with union's failure to provide employment security during the previous recession:  $\lambda^{(t-\phi)} U_t^p$ , where  $U_t^p$  is the level of unemployment in the preceding trough of the business cycle,  $t$  is the current year,  $\phi$  is the year of the preceding trough of the business cycle, and  $\lambda$  takes account of the rate at which worker displeasure with their union's failure to provide employment security during the last recession decays ( $0 \leq \lambda \leq 1$ ). This measure of workers' discontent with unions has a maximum value during a recession and declines as time passes; the next recession again raises this measure to its maximum value. I will label this variable "Last Recession."

Narrowly defined economic costs and benefits are not the only determinants of union decertification. For instance, union members' interest in union decertification is shaped by a demonstration effect: when unions are seen as successful organizations, union workers are less likely to decertify their union. Anderson et al. measure the extent of this demonstration effect by the percentage of workers unionized in the recent past, "Percent Unionized <sub>$t-1$</sub> ." An increase in Percent Unionized <sub>$t-1$</sub>  should be associated with a decline in the pace of union decertification. Anderson et al. also raise the possibility that this variable has a nonlinear impact and, so, suggest that the demonstration effect might be measured alternatively by "Percent Unionized <sub>$t-1$</sub> <sup>2</sup>."

Similarly, when public support for unions is high, union workers will feel informal social pressure to remain unionized. Anderson et al. use "Percent Democrat," the percentage of Democrats in the House of Representatives, as a proxy for public support for unions.

Finally, the passage of the Landrum-Griffin Act of 1959 provided a temporary political/institutional change in costs and benefits. By limiting national unions' control of their locals, the act made it easier (lower cost) for discontented union members to initiate a move for union decertification. Anderson et al. represent the impact of Landrum-Griffin Act, "LG Act," by a dummy variable equal to 1 during the first three years after the passage of the act. According to Anderson et al., this three-year period was chosen "to take into account the length of trusteeships and the subsequent time required to petition for the NLRB to hold a decertification election" (1980, p. 102).

*Neoclassical model.* A regression implementing the neoclassical theory of union decertification is:

$$\begin{aligned} \text{DECERTS}_t = & \alpha_0 + \alpha_1 \Delta \text{CPI}_t + \alpha_2 \Delta E_t + \alpha_3 \Delta E_{t-1} + \alpha_4 \Delta E_{t-2} + \alpha_5 \Delta E_{t-3} \\ & + \alpha_6 (\text{Last Recession})_t + \alpha_7 (\text{Percent Unionized})_{t-1} \\ & + \alpha_8 (\text{Percent Democrat})_t + \alpha_9 (\text{LG Act})_t + e_{nt}. \end{aligned} \quad (1)$$

The predicted signs are:  $\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5, \alpha_6, \alpha_9 > 0$  and  $\alpha_7, \alpha_8 < 0$ . The present and past values of  $\Delta E$  are assumed to follow an Alman lag. The impact of the demonstration effect is alternatively measured by Percent Unionized<sup>2</sup>: the model using Percent Unionized will be labeled as “Neo-classical<sup>1</sup>” while that using Percent Unionized<sup>2</sup> will be labeled as “Neo-classical<sup>2</sup>.” These equations, and the definitions of variables appearing above, follow exactly Anderson et al. (1980). The definitions of all variables and data sources appear in Table 1.

The dependent variable will be measured in three ways. First, I will use two dependent variables used by Anderson et al.: the annual number of voters in bargaining units that select union decertification (Decertified

TABLE 1  
VARIABLE DEFINITIONS

Variable	Definition
<i>Dependent Variables</i>	
Decertified Workers	Number of voters in union decertification elections in which no representative was chosen. Data: <i>Annual Report of the National Labor Relations Board</i> , various years.
Decertified Units	Number of union decertification elections in which no representative was chosen. Data: <i>Annual Report of the National Labor Relations Board</i> , various years.
Decertified Workers per Union Employee	Number of voters in union decertification elections in which no representative was chosen per union employee. Decertification data: <i>Annual Report of the National Labor Relations Board</i> , various years. Union employees: (employment on private nonagricultural payrolls) x (union density in private sector). Employment data: <i>Handbook of Labor Statistics</i> , 1967, Table 33 and <i>Economic Report of the President</i> , 1995, Table B-44. Union density data: Leo Troy and Neil Shelfin, <i>U.S. Union Sourcebook</i> , West Orange, NJ: Industrial Relations Data and Information Services, 1985 and Bureau of Labor Statistics, <i>Characteristics of U.S. Workers</i> , various years.
<i>Independent Variables for Neoclassical Theory</i>	
Percent change in CPI	Percent increase in consumer price index for all urban consumers. Data: <i>Handbook of Labor Statistics</i> , 1989, Table 113 and <i>Economic Report of the President</i> , 1995, Table B-59.
Percent change in employment	$(N_t - N_{t-1})/N_{t-1}$ where N is a) employment on private nonagricultural payrolls or b) employment in nonagricultural payrolls. Employment data: see above.

Last Recession	$\lambda (t - \phi) U_t^p$ , where $U_t^p$ is the level of unemployment in the preceding trough of the business cycle, $t$ is the current year, $\phi$ is the year of the preceding trough of the business cycle, and $\lambda$ is the rate at which worker displeasure with their union's failure to provide employment security during the last recession decays ( $0 \leq \lambda \leq 1$ ). Unemployment rate, all civilian worker: <i>Economic Report of the President</i> , 1995, Table B-40 and <i>Handbook of Labor Statistics</i> , 1967, Table 49. Dating of business cycles from NBER.
Percent Unionized	Union members as a proportion of all private employees. Union density data: see above.
Percent Democrats in House	Democratic party members as a percent of total membership of the U.S. House of Representatives. Data from: <i>Members of Congress Since 1784</i> , Congressional Quarterly Inc. 1977 (Table: Political Party Affiliations in Congress) and <i>Statistical Abstract of the United States</i> , 1992, Table 421.
Approve of Unions	Percentage of those who "approve" of unions. Data: <i>Public Opinion 1991</i> , Scholarly Resources Inc., Wilmington, DE, p. 154. Interpolation/extrapolation used to generate annual time series.
Landrum-Griffin Act	Binary variable: 1 in 1959, 1960, 1961; 0 in all other years.
<i>Independent Variables for Institutional Theory</i>	
Unfair Labor Practice Charges per Union Employee	Unfair labor practice cases against employers opened by NLRB per union employee. Unfair labor practice data: <i>Annual Report of the National Labor Relations Board</i> , various years. Union employees: defined above.
Republican President	A binary variable equal to 1 if a Republican holds the presidency and 0 if a Democrat holds the presidency.
Social Spending/ Unemployment	$(\text{Per capita real social welfare spending}) \div (\text{unemployment rate})$ . Per capita social welfare spending: Per capita real social welfare spending on programs that benefit employees and their families. Real social welfare spending: $(\text{total social insurance spending} + \text{public aid spending}) \div (\text{consumer price index for all urban consumers})$ . Total social insurance and public aid data: <i>Historical Statistics of the United States</i> , series H5 and H14 and <i>Statistical Abstract of the United States</i> , various years. Per capita spending determined by using civilian noninstitutionalized population, 16 years and older. Population data: <i>Economic Report of the President</i> , 1995, Table B-33. Consumer price index: see above. Unemployment Rate: see above.

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Workers) and the annual number of bargaining units decertified (Decertified Units). Data on the first variable were collected starting in 1950 while data on the second variable were collected starting in 1948. In addition, a third dependent variable will be used: the number of voters in decertified bargaining units per union employee (Decertified Workers per Union Employee). The latter variable has the advantage of being a better measure of the pace of union decertification (as it scales union decertification by the stock of union employees) but has the disadvantage of introducing

some measure of spurious correlation with the independent variables Percent Unionized and Percent Unionized<sup>2</sup>.

*Results.* Table 2 presents the results of the six neoclassical regressions. Beta coefficients are reported, except for LG Act which remains as a binary variable. In each regression the optimal value of  $\lambda$ ,  $\lambda_0$ , is estimated and Last Recession is measured by  $\lambda_0^{(t-\theta)} U_t^p$ .

TABLE 2  
NEOCLASSICAL THEORY  
DETERMINANTS OF UNION DECERTIFICATION, 1948/1950–1993

Regression:	1	2	3	4	5	6
Dependent Variable:	Decertified Workers	Decertified Workers	Decertified Units	Decertified Units	Decertified Workers per Union Employee	Decertified Workers per Union Employee
Variable (predicted sign):						
Percent Change in $CPI_t$ (+)	0.29** (4.1)	0.24** (3.5)	0.27** (4.0)	0.22** (3.5)	0.17** (2.9)	0.13* (2.1)
Percent Change in Employment <sub>t</sub> (+)	0.19* (2.4)	0.19* (2.4)	0.18* (2.2)	0.19* (2.5)	0.17* (2.5)	0.16* (2.5)
Percent Change in Employment <sub>t-1</sub> (+)	0.09 (1.4)	0.09 (1.4)	0.11 (1.7)	0.11 (1.9)	0.07 (1.4)	0.07 (1.3)
Percent Change in Employment <sub>t-2</sub> (+)	0.06 (1.0)	0.06 (1.0)	0.07 (1.3)	0.07 (1.4)	0.05 (0.9)	0.05 (0.9)
Percent Change in Employment <sub>t-3</sub> (+)	0.10 (1.5)	0.10 (1.6)	0.07 (1.1)	0.07 (1.2)	0.08 (1.5)	0.09 (1.6)
Last Recession, (+)	0.43** (5.4)	0.42** (5.6)	0.45** (5.5)	0.44** (5.9)	0.44** (6.6)	0.43** (6.7)
Percent Unionized <sub>t-1</sub> (-)	-0.58** (-8.4)		-0.54** (-7.7)		-0.69** (-11.5)	
Percent Unionized <sub>t-2</sub> (-)		-0.62** (-8.9)		-0.61** (-9.1)		-0.72** (-11.9)
Percent Democrats in House (-)	-0.00 (-0.0)	-0.03 (-0.5)	0.09 (1.2)	0.04 (0.6)	-0.07 (-1.2)	-0.10 (-1.8)
Landrum-Griffin Act (+)	0.31 (1.1)	0.34 (1.3)	-0.03 (-0.1)	0.01 (0.0)	0.36 (1.5)	0.38 (1.6)
Constant	-0.03 (-0.5)	-0.04 (-0.6)	-0.03 (-0.5)	-0.03 (-0.6)	-0.03 (-0.7)	-0.04 (-0.7)
$\lambda^\circ$	0.891	0.891	0.897	0.889	0.901	0.904
$R^2$	.88	.89	.88	.90	.91	.92
Adjusted $R^2$	.85	.87	.85	.87	.89	.90
Durbin-Watson	1.35	1.39	1.05 <sup>o</sup>	1.11 <sup>o</sup>	1.50	1.55
Breusch-Godfrey	4.16 <sup>o</sup>	3.54	10.14 <sup>o</sup>	8.46 <sup>o</sup>	2.12	1.73
White (p-value)	0.20	0.20	0.22	0.24	0.28	0.31
N	44	44	46	46	44	44

Variables as defined in text and Appendix. Beta coefficients reported. *t*-statistics in parentheses.

\* Significant at the .05 level in a two-tailed test; \*\* significant at the .01 level in a two-tailed test.

<sup>o</sup> = Diagnostic test suggests problems with regression.



All six regressions achieve fairly good fits as measured by  $R^2$ . Regressions 5 and 6 have the best fits, but their slightly higher  $R^2$  and the larger (negative) coefficient estimates for the unionization variables are possibly the result of spurious correlation between Percent Unionized and the dependent variable in these two regressions. The fits of the other four regressions, however, are almost as good as those achieved by regressions 5 and 6.

Significant Breusch-Godfrey statistics in regressions 1, 3, and 4 point toward positively autocorrelated residuals in these regressions. Both RESET and White's tests failed, however, to find evidence of misspecification in these regressions. The autocorrelation that exists, then, seems to be pure autocorrelation and not the result of a flawed neoclassical model. In this case, the reported coefficient estimates for these three regressions are unbiased, although the standard errors of these coefficients are biased.

The results of regressions 2, 5, and 6—which do not suffer from autocorrelated residuals—are similar to the results for the regressions that do suffer from autocorrelation. Most important, the pattern of statistical significance for the coefficients is identical for all six regressions. The results for regressions 1, 3, and 4 are not simply an artifact of autocorrelation.

All coefficients that achieved statistical significance in these six regressions had the signs predicted. The neoclassical hypotheses about the impact on union decertification of increased inflation, employment growth, layoffs during recessions (i.e., Last Recession), and the demonstration effect (i.e., Percent Unionized) are supported by these empirical results.<sup>1</sup>

Table 3 presents point estimates of the causes of the increased union decertification from the first years data exist (1950–1952 for Decertified Workers) to the peak years of union decertification (1982–1984). The numbers in Table 3 are based on the coefficients of regression 2, which is arguably the best of the six regressions. To eliminate the impact of events in particular years, changes in the growth of union decertification is estimated between three-year periods.

The largest single cause (51 percent) of the increase in union decertification over this period of time was a fall in unionization rates, which dem-

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<sup>1</sup> This pattern of statistical significance is generally the same, with one exception, as found by Anderson et al. (which used data only up to 1977). However, whereas Anderson et al.'s coefficient for  $\Delta E$  was negative, I found a positive coefficient for this variable. Ironically, my results were consistent with the predictions offered by Anderson et al. Further, although I was unable to exactly reproduce Anderson et al.'s results using the same time period they did, in all cases the models I estimated achieved higher  $R^2$  than comparable regressions estimated by Anderson et al.

TABLE 3  
NEOCLASSICAL THEORY: CAUSE OF THE GROWTH IN  
UNION DECERTIFICATION, 1950/1952 TO 1982/1984

Cause	Percent Contribution to Growth in Union Decertification
Percent Change in CPI (increase)	11
Percent Change in Employment (decrease)	-7
Last Recession (increase)	19
Percent Unionized (decrease)	51
Percent Democrats in House (no change)	0
Unexplained	26
Total	100

onstrated to workers that unions were no longer successful organizations able to achieve what workers wanted. The failure of unions to deliver the goods (during periods of inflation and recession) also accounted for a substantial part of the rise in union decertification: 19 percent of the rise was caused by the failure of unions to provide employment security for their members during recessions and 11 percent of the rise was caused by union failure to protect the real wages of their members during periods of escalating inflation.

The data did not reject the neoclassical theory of union decertification. Indeed, this theory performed quite well when confronted with the data. The model tested here supported most of the relationships hypothesized by Anderson et al.’s theory and provided a coherent story about the rise of union decertification in the postwar U.S. economy. Although we cannot say that any econometric model is “true,” we can say that Anderson et al.’s model was—using the standard articulated by Feldstein (1982, p. 829)—“parsimonious, plausible and informative.”

### The Institutional Theory of Union Decertification

The difference between the institutionalist research program and neoclassical research program is *not* that one takes account of institutions and the other fails to do so. Rather, the difference lies in *how* institutions are conceived. Neoclassical theory sees institutions as external constraints that, possibly, affect the costs and benefits faced by individual agents. At best, institutions have the same ontological status as do relative prices. Neoclassical regression models, first, introduce standard economic variables that affect costs and benefits and, then, add institutional variables

that might also affect costs and benefits *if* standard economic variables are seen to not adequately explain economic behavior.

In institutionalist theory, institutions are not conceived as external constraints to individual decision making. Rather, in this research program, an institution is a *pattern of interaction* between individuals that is widely distributed over space and reproduced over time. Sometimes, institutions are the product of the development of norms, shared beliefs and values, or socialization. Other institutions are the result of a coercive intervention: either self-enforcing or through the use of third-party enforcement.

Institutionalist theory sees institutions as ontologically equal to agency and prior to any particular costs and benefits. Therefore, institutionalist regression models begin with variables that represent institutional forces. Variables representing particular costs and benefits facing individual actors enter *only if* a compelling justification is given for their introduction. No single cost/benefit variable need be included, however, if institutional variables seem to adequately explain the economic behavior under consideration. Institutional and neoclassical theory differ greatly on this point.

*Institutionalist theory of the growth of union decertification.* Nilsson (1996) developed and tested an institutionalist theory of union decertification in the postwar United States. This theory was developed from within the social structures of accumulation framework of social/economic analysis (e.g., Bowles, Gordon, and Weisskopf 1990; Nilsson 1994b).

In this theory, the institution most relevant to union decertification in the postwar U.S. economy was the “capital-labor accord.” The accord was a particular pattern of interaction between major U.S. corporations and unions: implicitly, it was an agreement to live and let live. Major U.S. corporations accepted that unions had the right to exist and that unions were the legitimate representative of their unionized workers. On their part, unions agreed not to challenge critical “management rights,” in particular the right to organize production and make investments as management saw fit.

The accord had its origins in the social and political upheavals of the 1930s. The bitter battles between labor and management during that era led unions and large corporations to seek out a truce. The truce was greatly facilitated by the passing of the National Labor Relations Act (NLRA), which clarified the rules of the game involved in the accord and, just as important, established a third-party coercive structure (the National Labor Relations Board [NLRB]) to produce and reproduce this accord between labor and management.

The capital-labor accord was directly responsible for the growth of labor unions in the United States after 1936. Business' relative tolerance of unions and the protections afforded workers by the NLRA provided an environment conducive to rapid unionization. In turn, as discussed below, an erosion of the accord after the early 1960s was responsible for the decline of labor unions and the parallel rise in union decertification.

*Employer rejection of the capital-labor accord.* The primary cause of the erosion of the capital-labor accord—and so of the rise of union decertification—was employer abandonment of the accord. The accord contributed to a good investment climate for firms in the United States by promoting labor peace and ushering in a period of demand-led economic growth. The accord, however, also led to higher-cost production and heightened shop-floor inflexibility. These latter two consequences of the accord were unimportant during the economic and political dominance of the United States in the world economy in the 1950s and early 1960s.

The erosion of U.S. economic and political hegemony undercut management's acceptance of the capital-labor accord (Nilsson 1996). High production costs and shop-floor inflexibility became a handicap for U.S. firms as they faced serious foreign competition for the first time since the end of World War II. By the late 1960s, as U.S. hegemony continued to wain, U.S. corporations increasingly abandoned the capital-labor accord.

Frequently, management's abandonment of the accord took the form of a refusal to bargain in good faith and discriminatory firing of pro-union workers—violations of the NLRA. Effective third-party enforcement of the capital-labor accord would have halted such activities. Yet the NLRB is unable to provide for such enforcement. The NLRB is only able to utilize remedial (rather than punitive) corrective actions, and so the NLRB is generally only able to restore the status quo before the violation. Even this restoration of the status quo is a time-consuming process. The NLRB must first ascertain management's intent (refusing to bargain in good faith or hard bargaining?; firing a worker because the worker was pro-union or merely a poor worker?) before deciding whether to reestablish the status quo. The impact on unions can be, in the meantime, chilling.

U.S. labor laws not only provide for weak third-party enforcement of the accord, they also make self-enforcement of the accord very difficult for unions. While U.S. labor laws provide only remedial and, generally, delayed punishment for management violations of the accord, these same laws generally provide rapid relief to management when unions use their

own most powerful weapons against management. For instance, the sit-down strike is not a protected activity and so management can quickly fire those participating in such a strike. The secondary boycott is virtually per se illegal and, so, management can rapidly get an injunction forbidding the boycott as soon as one is instituted.

Absent effective third-party enforcement or self-enforcement of the accord, management's abandonment of the accord could not be stopped, and the accord eroded. Once the accord started to erode, union membership no longer made sense for many workers and the pace of union decertification increased.

The extent of employer rejection of the accord can be measured quite simply by the number of unfair labor practice charges made against employers per union employee ("ULP per Union Employee").<sup>2</sup> When ULP per Union Employee increases, union decertification should likewise increase.

*Control of the state.* The executive branch has a major responsibility for the (weak) third-party enforcement of the capital-labor accord. It enforces U.S. labor laws and, so, the capital-labor accord, through a variety of channels: (1) the general policies of the president as implemented by various executive branch agencies, (2) presidential control of appointments to the NLRB, and (3) particular actions taken (or not taken) by the executive branch that affect the legitimacy of antiunion behavior by private firms.

Because many gray areas exist in U.S. labor laws, the executive branch has the power to determine the strictness with which it enforces the capital-labor accord. A reduction in the strictness of the enforcement of the NLRA should be associated with a decline in unionization and, in particular, with an increased pace of union decertification.

Republican administrations have generally been less insistent in their enforcement of the rules of the game of the accord. The simplest way to introduce the impact of this factor is by a dummy variable, "Republican President," equal to 1 when Republicans hold the presidency and 0 when Democrats hold the presidency. When this variable is 1, union decertification should be greater as third-party enforcement of the capital-labor accord is weaker.

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<sup>2</sup> The postwar increase in unfair labor practice charges against employers was caused by wider institutional changes, most notably the decline of U.S. economic and political hegemony (Nilsson 1996). A neo-classical literature has argued that a key cause of the postwar rise in unfair labor practices stems from changes in compliance incentives. Yet Flanagan (1987, p. 87) admits that empirical support for this neo-classical proposition is quite weak.

*Worker power.* Union workers are not, of course, completely powerless against management's attacks on their unions. While the NLRA restricted many of the tactics union workers could use to make the capital-labor accord self-enforcing, it did not eliminate all such tactics on the part of unions and union workers (e.g., particular categories of strikes, work-to-rules).

The power of the tactics workers could use to make the capital-labor accord self-enforcing varied with the power of individual workers and unions. The greater is workers' power, the better able they are to force management to (grudgingly) accept unionization. Therefore, the greater is workers' power the less likely workers are to decertify their union.

The extent of worker power depends on many factors. Rather than introducing a range of different variables, the model presented in Nilsson (1996) uses a single composite variable. This variable takes into account the interaction of the level of the reserve army of the unemployed and government programs that benefit workers and their families: (per capita real social welfare spending on programs that help workers)  $\div$  (rate of unemployment). An increase in this variable, "Social Spending/Unemployment," should be associated with a reduction in union decertification activity.

*Institutionalist model.* According to the institutionalist theory, the pace of union decertification in the postwar United States can be explained by the regression:

$$\text{DECERTS}_i = \beta_0 + \beta_1 (\text{ULP per Union Employee})_i + \beta_2 (\text{Republican President})_i + \beta_3 (\text{Social Spending/Unemployment})_i + e_{it}. \quad (2)$$

The predicted signs of the coefficients are  $\beta_1, \beta_2 > 0$  and  $\beta_3 < 0$ .

As with the neoclassical model, the dependent variables used to estimate the institutionalist model will be Decertified Workers, Decertified Units, and Decertified Workers per Union Employee. The use of Decertified Workers per Union Employee again introduces some measure of spurious correlation between the dependent variable and one of the independent variables, in this case, ULP per Union Employee.

*Results.* Table 4 presents ordinary least square estimates of the institutionalist model. Beta coefficients are reported for ULP per Union Employee and Social Spending/Unemployment. Republican President remains as a binary variable.

All three institutionalist regressions achieve good fits. Regression 9 achieves the best fit, but some portion of this fit is possibly the result of spurious correlation between the dependent variable and ULP per Union Employee.

TABLE 4  
 INSTITUTIONALIST THEORY: DETERMINANTS  
 OF UNION DECERTIFICATION, 1948/1950–1993

Regression:	7	8	9
Dependent Variable:	Decertified Workers	Decertified Units	Decertified Workers per Union Employee
Variable (predicted sign)			
Unfair Labor Practices per Union Employee (+)	1.11** (13.4)	1.10** (13.8)	1.14** (17.1)
Republican President (+)	0.15 (1.4)	0.07 (0.7)	0.25** (2.9)
Social Spending/Unemployment (–)	–0.24** (–2.9)	–0.21** (–2.6)	–0.28** (4.1)
Constant	–0.09 (–1.1)	–0.04 (–0.6)	–0.16* (–2.4)
$R^2$	.90	.91	.94
Adjusted $R^2$	.89	.90	.93
Durbin-Watson	1.22	0.61°	1.61
Breusch-Godfrey	5.24°	35.03°	0.81
White (p-value)	0.33	0.06	0.12
N	44	46	44

Variables as defined in text and Appendix. Beta coefficients reported. *t*-statistics in parentheses.

\* Significant at the .05 level in a two-tailed test; \*\* significant at the .01 level in a two-tailed test.

° = Diagnostic test suggests problems with regression.

Regressions 7 and 8 suffer from autocorrelated residuals. RESET and White's tests, however, fail to find evidence of misspecification in either regression. As in the case of the neoclassical regressions, the autocorrelation that exists appears to be pure autocorrelation. The fact that the two statistically significant coefficients in regressions 7 and 8 are also statistically significant in regression 9 (for which diagnostic tests failed to find any problems) suggests, however, that the results of regressions 7 and 8 are not merely the result of autocorrelation.

Two of the independent variables (ULP per Union Employee and Social Spending/Unemployment) are statistically significant with the predicted sign in all three regressions. These results are consistent with the institutionalist hypothesis that union decertification in the postwar United States was promoted by management's rejection of the capital-labor accord and with the hypothesis that increased bargaining power of workers tended to reduce union decertification. The coefficient for Republican President is always positive, as predicted, but achieves statistical significance in only one regression.

Table 5 indicates that the growth in employer rejection of the capital-labor accord (measured by unfair labor practice charges against employers) was the dominant cause of the growth of union decertification from the early 1950s to the peak years of union decertification in 1982/84. (The point estimates in Table 5 are based on regression 8.) In the absence of other forces affecting union decertification, employer rejection of the capital-labor accord alone would have caused the observed increase in union decertification.

The institutionalist theory performed well when confronted with the data. No less than the neoclassical model, the institutionalist model appears to be “parsimonious, plausible and informative.”

### Interresearch Program Theory Comparison

The account of increased union decertification in the postwar United States offered by the institutionalist theory differs markedly from that offered by the neoclassical theory. The institutionalist theory proposes that management abandonment of the capital-labor accord lay behind the rapid increase in union decertification after the late 1960s. The neoclassical theory contends a decline of unions (via the demonstration effect) along with a failure of unions to deliver the goods were the dominant causes of the increased rate of union decertification.

The empirical evidence supports both interpretations. Further, neither model performed notably better when tested against the data: they both achieved good fits, diagnostic tests failed to identify misspecification in either theory, and the predictions made by the two theories were generally supported by coefficient estimates. In short, both theories of union decertification should be taken seriously.

TABLE 5  
INSTITUTIONALIST THEORY: CAUSE OF THE GROWTH IN  
UNION DECERTIFICATION, 1950/1952 TO 1982/1984

Cause	Percent Contribution to Growth in Union Decertification
Unfair Labor Practices per Union Employee (increase)	112
Republican President (increase)	6
Social Spending/Unemployment (increase)	-14
Unexplained	0
Total	100



*Nonnested hypotheses.* The neoclassical and institutionalist theories of union decertification are nonnested. That is, neither theory can be generated by imposing restrictions on the other theory. Nor can these two theories be considered as being nested within a larger *coherent* metatheory.<sup>3</sup> Institutional theory claims that social phenomena are best explained by reference to institutions and not by reference to individuals and their decisions. Yet the variables included as independent variables in the neoclassical theory are conceived to be relevant to the costs and benefits that affect individual decision making. Neoclassical theory claims economic outcomes are the result of individuals comparing costs and benefits. Yet the variables appearing within the institutionalist theory are intended to measure patterns of social interaction independent of individual optimizing. A metatheory that simply combines the independent variables offered by the two different theories would be incoherent.

*Cox nonnested hypothesis tests.* The criterion of “best fit” fails to provide us with a valid method of selecting the “true” theory from among a set of rival nonnested theories. Indeed, goodness-of-fit measures can even fail to identify the “best” theory (Pesaran 1974; Lovell 1983).

Cox tests address the weaknesses of goodness-of-fit comparisons.<sup>4</sup> Cox tests replace informal comparisons of fit with explicit hypotheses about the truth of a theory that can be rejected—or not rejected—on statistical grounds. In particular, they provide a way of formally testing the null hypothesis “theory  $M_0$  is true.”

Cox tests can be informally described as follows. If theory  $M_0$  is true, then this theory should be able to explain the performance of rival (false) theories. That is, it should be able to “encompass” rival theories (Mizon and Richard 1986). In particular, a true  $M_0$  should be able to predict the most important measure of the performance of rival theory  $M_1$ : the variance of the residual series associated with  $M_1$ . If  $M_0$  successfully does so, it is said to “variance encompass” the rival theory (Hendry 1983).

Cox tests can be implemented in a straightforward way. First, the residual series of  $M_1$ ,  $\sigma_1^2$ , is found in the standard way by regressing the dependent variable  $Y$  onto the independent variables offered by theory  $M_1$ .

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<sup>3</sup> An earlier empirical literature argued that some neoclassical theories are nested in larger metatheories that include social and institutional variables not included in neoclassical theory (e.g., Weisskopf, Bowles, and Gordon 1983; Nilsson 1994a).

<sup>4</sup> An alternative way of testing two nonnested theories is to *artificially* nest both in a single model and then perform a pair of F-tests on each set of variables. Unfortunately, as is often the case, such an approach would be fruitless here because of the high degree of correlation (-0.95) between Unfair Labor Practices per Union Employee and Percent Unionized.

Second, the residual series of  $M_1$  predicted by  $M_0$ ,  $\sigma_{10}^2$ , is found by regressing the values of  $Y$  predicted by  $M_0$  onto the variables of  $M_1$ . The null hypothesis " $\sigma_{10}^2 = \sigma_1^2$ " then reflects the claim that theory  $M_0$  can explain the performance of the rival theory  $M_1$ .

If the latter null is rejected, then the null "theory  $M_0$  is true" is also rejected. On the other hand, the failure to reject the null hypothesis " $\sigma_{10}^2 = \sigma_1^2$ " represents a failure to reject the null hypothesis "theory  $M_0$  is true."

The Cox test provides a way of determining whether the null hypothesis " $\sigma_{10}^2 = \sigma_1^2$ " can be rejected or not rejected (Cox 1961; Pesaran 1974). Cox showed that if the assumptions of the test are valid, the reported test statistic of his test,  $C$ , is asymptotically distributed as  $N(0,1)$  when the null hypothesis " $M_0$  is true" is indeed true. If  $|C|$  is greater than 1.96 then this null hypothesis is rejected at a 5 percent significance level in a two-sided test. On the other hand, if  $|C|$  is less than 1.96, then this null hypothesis is not rejected. The nonrejection of the null hypothesis suggests that  $M_0$  is able to account for the performance of the rival theory,  $M_1$ : in this case,  $M_0$  variance encompasses  $M_1$ .

The above procedure permits nothing to be concluded about the adequacy of  $M_1$ : the null hypothesis accepted or rejected referred only to  $M_0$ . The former model was merely used to see if  $M_0$  could—or could not—variance encompass it. Testing the adequacy of  $M_1$  requires that the roles of  $M_0$  and  $M_1$  be reversed in the above procedure: the null hypothesis "theory  $M_1$  is true" is now tested by using  $M_0$  as the rival theory. Statements about whether  $M_1$  does, or does not, variance encompass  $M_0$  could then be made.

Importantly, the Cox test holds out the possibility that *both* theories are rejected if both fail to encompass their rival. This makes this test superior to other tests that merely seek to identify the theory with the "best fit."

The selection of the particular Cox test used to test the neoclassical and the institutionalist models against each other must take into account the existence of a small sample size ( $N < 50$ ). The modification of the Cox test proposed by Godfrey and Pesaran, which I will label  $C_s$ , has the best small sample properties of Cox tests that are constructed assuming that error terms are uncorrelated (Godfrey and Pesaran 1983; Zabel 1993).

The Cox tests used in the present study must also, at times, take into account the presence of (pure) autocorrelated residuals. McAleer, Fisher, and Volker (1982) showed that the presence of autocorrelation can make the preferred Cox test for small samples,  $C_s$ , inconsistent. The Cox test developed by Pesaran (1974) which takes account of autocorrelated errors, which I will identify as  $C_a$ , performs as well, or better, than other such tests that do not (Bernanke, Bohn, and Reiss 1988). This test, however, is only asymptotically valid.

*Cox test results.* Two basic null hypotheses will be tested:

1.  $H_N = T$ : “the neoclassical theory is true,” and
2.  $H_I = T$ : “the institutionalist theory is true.”

In the first null hypothesis, the institutionalist theory is used as the rival theory; in the second null hypothesis, the neoclassical theory is used as the rival theory.

Six versions each of  $H_N = T$  and of  $H_I = T$  need to be tested. This is because there are two different versions of the neoclassical model (Neoclassical<sup>1</sup> and Neoclassical<sup>2</sup>) and three different dependent variables. Further, because it is not clear whether the Cox test adjusting for small size is superior to that which adjusts for autocorrelated residuals, both  $C_s$  and  $C_a$  will be calculated where autocorrelated residuals are present.

Table 6 presents the relevant Cox statistics. As seen, the null hypothesis “the neoclassical theory is true” was rejected by all ten tests. The neoclassical model of union decertification—despite performing well *against the data*—apparently fails when confronted with the rival institutionalist model.

The institutionalist model survives these Cox tests much better than does the neoclassical model. The null hypothesis “the institutionalist theory is true” was rejected by only one out of ten tests. One rejection is no more than would be expected with a 5 percent significance test (i.e., one rejection would be seen half the time with ten tests performed). The institutionalist model *apparently* variance encompasses the neoclassical model.<sup>5</sup> More definitive statements about the “truthfulness” of the institutionalist model cannot be made at this time.

One additional issue must be addressed: the correlation of -0.95 between the key independent variables in the two different theories—the Percent Unionized and Unfair Labor Practices per Union Employee—raises the possibility that these two variables are mutually interrelated or, perhaps, that a decline in unionization is actually a fundamental cause of increased employer violations of the NLRA. The Cox tests performed fail to address these possibilities.

Granger causality tests can be used to shed light on this issue. It can be shown that Unfair Labor Practice per Union Employee helps predict (“Granger causes”) Percent Unionization. Percent Unionization, however, does *not* help predict Unfair Labor Practice per Union Employee. This

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<sup>5</sup> The one rejection of the institutionalist theory occurred when Decertified Workers per Union Employee was used as the dependent variable. But, as discussed previously, the fit of both the neoclassical and institutionalist models are likely biased upward by spurious correlation when this particular dependent variable is used.

TABLE 6  
COX TEST RESULTS

Null Hypothesis <sup>a</sup>			Test Statistic		
True Theory	Rival Theory	Dependent Variable	N <sub>s</sub>	N <sub>a</sub>	
Neoclassical <sup>1</sup>	Institutionalist	Decertified Workers	-6.56**	-4.88**	Rejected
Neoclassical <sup>1</sup>	Institutionalist	Decertified Units	-6.96**	-5.00**	Rejected
Neoclassical <sup>1</sup>	Institutionalist	Decertified Workers per Union Employee	-7.46**	—	Rejected
Neoclassical <sup>2</sup>	Institutionalist	Decertified Workers	-6.07**	-2.87**	Rejected
Neoclassical <sup>2</sup>	Institutionalist	Decertified Units	-5.77**	-5.31**	Rejected
Neoclassical <sup>2</sup>	Institutionalist	Decertified Workers per Union Employee	-7.07**	—	Rejected
Institutionalist	Neoclassical <sup>1</sup>	Decertified Workers	-1.27	1.37	Not Rejected
Institutionalist	Neoclassical <sup>1</sup>	Decertified Units	-0.64	1.01	Not Rejected
Institutionalist	Neoclassical <sup>1</sup>	Decertified Workers per Union Employee	-1.98*	—	Rejected
Institutionalist	Neoclassical <sup>2</sup>	Decertified Workers	-1.41	0.59	Not Rejected
Institutionalist	Neoclassical <sup>2</sup>	Decertified Units	-1.32	-0.27	Not Rejected
Institutionalist	Neoclassical <sup>2</sup>	Decertified Workers per Union Employee	-1.84	—	Not Rejected

\* Significant at the .05 level in a two-tailed test; \*\* significant at the .01 level in a two-tailed test.

<sup>a</sup>Neoclassical<sup>1</sup> uses Percent Unionized as an independent variable while Neoclassical<sup>2</sup> uses Percent Unionized<sup>2</sup> as an independent variable.

suggests that the success of the institutionalist theory is not due simply to the influence of the level of unionization on employer violations of the NLRA. However, that the main independent variable of the institutionalist theory helps predict the main independent variable of the neoclassical theory (but not vice versa) is further evidence supporting the institutionalist theory against the neoclassical theory.

### Robustness of Results: Variations of Neoclassical Model

The above Cox test results might not be robust to small changes in the neoclassical model. Indeed, three changes to the Anderson et al. model seem quite appropriate and any might lead to test results different from those reported above.

First, Anderson et al. postulate a single behavioral relationship between the rate of inflation and union decertification throughout the whole period: an increased rate of inflation tends to promote decertification as unions are

unable to protect the real wages of workers. Hendricks and Kahn (1983), however, suggest a more complicated relationship between inflation and union relative wages. During the 1950s and 1960s, before the expansion of cost of living adjustment clauses (COLAs) in union contracts, infrequent union contract negotiations gave nonunion workers greater protection from inflation. However, the expansion of COLAs in the 1970s (combined with persistent underestimation of inflation rates) permitted unions to protect the real wages of their members better than could nonunion workers protect their real wages.

Therefore, the effect of increased inflation on union decertification might be measured by two variables: one measuring increases in price inflation to 1971 (and zeros afterward) and the other for increases in price inflation for 1972 and afterward (and zero before). (The exact dating does not affect the results below). The coefficient on the first variable ( $\Delta CPI_t^1$ ) should be positive while the coefficient for the second variable ( $\Delta CPI_t^2$ ) should be negative.

Second, Anderson et al. measure public support for unions by the percentage of Democrats in the House of Representatives. A more direct measure of public support for unions, however, exists: Gallup Poll data for the proportion of those surveyed who said they “approve” of unions. “Approve of Unions” can be used in place of Percent Democrats.

Third, Anderson et al. measure employment opportunities for union members by the growth rate of *private* nonagricultural payrolls,  $\Delta E$ . However, this implicitly assumes that union workers are unable to take government employment. This is unlikely to be completely true. The use of a broader measure of employment growth in the neoclassical model should give a slightly different (and perhaps better) fit for the neoclassical model. I will use the growth rate of total nonagricultural payrolls (which includes government employees),  $\Delta TE$ , as an alternative measure of employment opportunities.

Further, in Anderson et al.’s model the employment growth rate enters as a moving average. Yet individual lagged values for the growth rate of employment never achieve statistical significance (as seen in Table 2). Therefore, it seems appropriate—absent a compelling reason to include lagged values—to consider using only the *current* value of the employment growth rate in the neoclassical regressions.

With these proposed changes, we now have thirty-two different sets of independent variables for the neoclassical model. Each regression uses Last Recession and LG Act. But, there are two different ways of measuring union impact (Percent Unionized and Percent Unionized2), two different ways of taking account of inflation ( $\Delta CPI$  versus  $\Delta CPI^1$  and  $\Delta CPI^2$ ), two

different ways of measuring public support (Percent Democrat and Approve of Unions), and four different ways of measuring employment growth ( $\Delta E$  and  $\Delta TE$ ; lagged versus only current value).

Selecting one single “best” set of independent variables to represent the neoclassical theory is an impossible—and inappropriate—task. Selecting the set of regressors giving the maximum adjusted  $R^2$  runs into the well-known criticism that such a procedure is unlikely to identify the “true” theory (Lovell 1983). But even if adjusted  $R^2$  was used as the selection criteria, the neoclassical model is estimated using three different dependent variables: it is unlikely that the *same* set of regressors will give the greatest adjusted  $R^2$  for all three dependent variables. More important, no guarantee exists that the neoclassical model that performs best against the data would necessarily perform best against a rival model.

Therefore, for each of the three dependent variables I will test all thirty-two sets of neoclassical regressors against the single original set of institutionalist variables. This gives us ninety-six different pairs of Cox tests ( $C_s$ ) to perform. Further, because of the presence of (pure) autocorrelated residuals in some regressions, the Cox test that adjusts for autocorrelation,  $C_a$ , will also be calculated for some of these nonnested tests. All told, 160 different *pairs* of Cox tests were performed.

*Robustness of neoclassical results.* Regression results are quite robust to the variations in the neoclassical model: the same variables are statistically significant/insignificant across all versions of the neoclassical model. In particular, the coefficient results for all ninety-six neoclassical regressions are quite similar to those reported in Table 2, with one exception noted below. (A longer version of this article, available on request from the author, provides details about these regressions.) The robustness of the neoclassical model (against the data) provides further support for this model of the growth of union decertification in the postwar United States.

Importantly, 43 of the alternative neoclassical regressions achieved better fits against the data than did the Anderson et al. model. While the differences in fit are often very small, they might be enough to alter the Cox test results based on the original Anderson et al. specification of the neoclassical model.

One result requires further consideration. In all regressions in which it appears,  $\Delta CPI_t^2$  is positive and statistically significant. But increased inflation after 1970 was supposed to have *reduced* the pace of union decertification as the presence of COLAs in union contracts supposedly gave union members an advantage over nonunion members during periods of

increased inflation. I must tentatively reject the neoclassical hypothesis about the relationship between the expansion of COLAs and a decline in the pace of union decertification.<sup>6</sup> The statistically significant coefficient for  $\Delta CPI_t^2$  is likely the result of spurious correlation. Whether regressions with this “misbehaving” variable should be considered as “neoclassical” is an open question.

*Robustness of Cox test results.* Table 7 presents the results of all pairs of Cox tests performed. All 160 Cox tests rejected the null hypothesis “the neoclassical theory is true” at a 1 percent significance level. (Again, details about these tests are available in an expanded version of this paper.)

Table 7 also reveals that 23 tests rejected the null hypothesis “the institutionalist theory is true” (at a 5 percent significance level but not at a 1 percent level). But of these rejections, 21 were by neoclassical models that included the “misbehaving” variable,  $\Delta CPI_t^2$ . The improved performance of these neoclassical models was apparently the result of spurious correlation. Cox tests, however, should be performed only with meaningful alternative models when such models are available; it is always possible to eventually reject a model by the sequential adding of irrelevant variables to a rival model. For this reason, it seems prudent to mark as “questionable” these particular rejections of the institutionalist model.

Of the two other rejections of the institutionalist model, one was provided by one of the original neoclassical regressions (regression 5 in Table 2). Importantly, if the null “the institutionalist model is true” was indeed true, then more than two rejections would have been expected just by chance alone. That only two rejections occurred in these tests is evidence supporting the null hypothesis “the institutionalist theory is true.” (Both rejections occurred when Decertified Workers per Union Employee was used as the dependent variable; as noted above, the fits of both the neoclas-

TABLE 7  
ROBUSTNESS OF COX TEST RESULTS

Theory Assumed as True	Number of Cox Test Results		
	Not Rejected	Rejected	Questionable Rejections
Neoclassical	0	160	0
Institutionalist	137	2	21

<sup>6</sup> It might be suggested that the expansion of COLAs merely reduced (but not reversed) the harmful effects of increased inflation on union decertification. Yet, this would have implied that the coefficient for  $\Delta CPI_t$  should have been less than that for  $\Delta CPI_t^2$ .

sical and institutionalist regressions are likely biased upward when this dependent variable is used.)

The rejection of the mainstream theory and the failure to reject the institutionalist theory by Cox tests are robust to changes in the neoclassical model. The institutionalist theory of union decertification variance encompasses the rival neoclassical theory while the reverse is not true. This suggests that, *as they are currently formulated*, the institutionalist theory provides a more progressive direction for research into union decertification than does the rival neoclassical theory.

## Conclusion

The benefit of testing theories both against the data and against rival theories was made clear in this article. The Anderson et al. model of union decertification performed adequately against the data: it achieved a good fit, standard regression diagnostics failed to point toward model misspecification, and the coefficient estimates were plausible. Yet, this particular model of union decertification was rejected when it was tested against a rival theory. That is, merely testing a model against the data—the standard approach in the economic literature—does not permit us to draw meaningful inferences about the adequacy of this model.

More controversially, the neoclassical model tested in this article was rejected in favor of a model from a quite different research program: institutionalism. This finding was robust to changes in both the dependent variable and the independent variables used by the neoclassical model. Indeed, the rejection of all 96 different versions of the neoclassical theory of the growth of union decertification makes this perhaps the strongest rejection of a theory yet found in the literature using nonnested hypothesis tests.<sup>7</sup>

The rejection of this one particular neoclassical theory by an institutionalist theory in this article does not imply that *any* other neoclassical theory would be similarly rejected by its institutionalist analog. We just do not know what the results of such interresearch program theory testing would be. But, *at the very least*, the theory comparison performed in this article

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<sup>7</sup> Some might argue that—despite the robustness testing performed—the “neoclassical theory” used in this paper was still misspecified and/or that the proxies used to measure theoretically proper variables were still flawed. Some might even be inclined to argue that the key institutionalist variable, unfair labor practices, should in fact appear in a properly specified neoclassical model. Still others might argue that tests involving the Anderson et al. model are meaningless because their approach was flawed from the very beginning: they did not derive their model from a formal optimizing exercise. None of these claims are necessarily unreasonable; however, they raise the specter noted by Blaug (1980, pp. 17–20) that reasonable economists might act in ways that serve to “immunize” their favored theory from empirical rejection.



points to this: no evidence exists that neoclassical models are empirically superior to models generated by alternative theoretical frameworks.

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