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The Effects of Unions on Profitability: Canadian Evidence

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Résumé de l'article

Malgré la grande quantité d'études qui ont analyse l'influence des syndicats sur nombre de variables, l'effet qu'ils ont eu sur les profits n'a guère attire l'attention. On peut attribuer cette omission à certaines appréhensions concernant l'exactitude des données disponibles sur les profits ou au manque de conséquences politiques perceptibles pouvant découler des réponses apportées à cette question. Un article récent de Clark (1984), où sont utilisées des statistiques américaines, soulève deux questions intéressantes: 1. l'influence des syndicats sur les profits peut varier selon le dénominateur choisi pour établir le taux et 2. l'importance de savoir si l'effet sur les profits n'opère que par les voies suggérées par la théorie néoclassique ou, au moins en partie, par d'autres voies proposées par la théorie de la négociation.

En utilisant les statistiques provenant de vingt grandes industries manufacturières compilées pendant la période 1971-1981, le présent article analyse l'influence des syndicats sur plusieurs mesures du profit. Les mesures retenues sont le niveau des profits, et le taux de rendement sur le capital, les ventes et les actifs. Dans chaque cas deux modèles sont estimes: équation de forme réduite (MCO) et équations simultanées (MC2E). Ces estimations ont pour but de chercher à répondre aux deux questions suivantes. La première de ces questions consiste dans l'ampleur de l'influence et la deuxième se demande si l'effet, s'il y en a un, provient totalement des salaires et de la productivité du travail comme le suggère la théorie néoclassique ou si l'effet opère au moins en partie par d'autres voies comme le soutient la théorie de la négociation.

Trois modèles réduits de formulation du niveau des profits indiquent, d'un point de vue statistique, des effets négatifs significatifs d'une ampleur de changement de 9 à 21 pour cent du niveau moyen des profits causes par une augmentation de dix points de pourcentage dans le degré de syndicalisation. Trois modèles réduits des divers taux de rendement donnent des effets négatifs significatifs dans l'éventail antérieurement note pour les taux de rendement sur le capital et les ventes, mais un léger effet positif non-significatif en ce qui a trait au taux de rendement sur les actifs.

Quatre modèles d'équation simultanées, à partir des mêmes variables que les modèles réduits, ont été ensuite mis au point pour évaluer les voies ou les canaux par lesquels l'effet de la pénétration syndicale agit sur les profits. Le processus fonde sur le taux de rendement sur le capital démontre que les syndicats influencent les salaires et la productivité d'une façon positive à peu près également sans autres effets sur les profits, d'où un effet nul dans l'ensemble. Le processus fonde sur le taux de rendement sur les ventes et les actifs démontre des effets généralement négatifs qui agissent presque totalement par les voies ou les canaux néo-classiques. Ces deux dernières estimations sont cependant faussées par des signes erronés en ce qui concerne le salaire et la productivité. On peut conclure, à tout prendre, que les constatations tendent vers un effet négatif de la syndicalisation sur les profits, mais il a été impossible d'obtenir une vision nette de la manière dont cette influence agit.

The Effects of Unions on Profitability
Canadian Evidence

Dennis R. Maki
and
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Considering rates of return on capital, sales and assets, the evidence primarily but not unambigously supports a negative effect of unions on profitability. Whether this occurs only through effects on wages and labour productivity or through other channels as well is unclear.

Despite an impressive collection of recent empirical work investigating the effect of trade unions on a number of variables (Freeman and Medoff, 1984; Clark, 1984, Addison 1985), the effect on profits has received little attention. Perhaps as noted by Freeman and Medoff (1981, p. 60) this is due at least in part to the fact that profits are «an extremely difficult variable to measure». However, data on an accounting measure of profits are usually available, and econometricians have generally been willing to use available data, even if they have obvious deficiencies as measures of what is really desired. We suspect a major reason for the paucity of empirical work in this area has been broad acceptance of the notion that unions have a negative effect on profits. After all, if they do not have such an effect, why have employers historically been so active in opposing unionization? Still, there is surely interest in estimating how large the effect has been, and as Clark (1984) discusses, in determining the manner in which this effect occurs[1].

This paper investigates the effect of trade unions on profitability in Canadian manufacturing industries, using pooled cross section-time series data for the 20 two-digit industries over the time period 1971-1981. Since the previous literature has suggested that unions have not affected the profit/sales ratio, but have had a negative effect on the return on capital

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1 Further, those who believe the world to be essentially competitive in the long-run, with all firms earning normal profits in the absence of unions, would argue unions could not reduce the rate of profit. They could at most force some firms out of business.

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(Freeman and Medoff, 1981, p. 61), we focus on examining the effect of different denominators as measures of «profitability». We present evidence in the form of reduced form models, as suggested by Clark (1984), as well as simultaneous equation models.

THEORETICAL CONSIDERATIONS

A naive theoretical formulation might specify that the effect of unions on profits is determined by the effect of unions on wages and labour productivity[2]. There is a large literature suggesting unions have a positive effect on wages (e.g. Macdonald and Evans, 1981); and while the literature concerning the effects of unions on labour productivity is neither as well developed nor unambiguous in its findings (Maki, 1983), the possibility of a positive short-run effect has not been convincingly refuted. Hence, one could argue that unions could have a positive, negative or zero effect on profits. Under this theoretical framework, it would appear that the effect of unions on profits will be properly estimated when the effect of unions on productivity is properly estimated (assuming we «know» the effect on wages).

However, as Clark (1984, pp. 893-903) discusses in detail, the matter is not this simple. First, even under a neoclassical monopoly unionism model, the effect of a union wage differential on the rate of return on capital depends upon the elasticity of substitution of capital for labour. Second, consideration of other models which allow unions to «force employers off their demand curves», and consideration of the structure of the output market faced by the firm, further complicate the analysis.

As discussed in Freeman and Medoff's recent book (1984), unions may affect many aspects of a firm's operations, and since profit is the «bottom line», all of these effects may impinge on profitability. A selected listing of potential effects follows. First, there is evidence that unions have a larger effect on fringe benefits than they do on money wages per se (Freeman, 1981), suggesting that total labour costs, and not wages alone, should be considered. Second, since labour productivity would be expected to rise with the capital-labour ratio, *ceteris paribus,* while profitability is not a monotonically increasing function of this ratio, labour productivity is not a sufficient measure of «productivity» for current purposes. Third, while union wage differentials would be expected to lead to increases in labour quality, the apparent compression of skill differentials attributed to unionism (Kumar, 1972) can lead to very complex labour quality effects

2 BROWN and MEDOFF (1978) argue in this vein.

across the skill spectrum. Fourth, wage and other rigidities introduced by multi-year union contracts can alter the cyclical behaviour of profitability. Fifth, the wide variety of provisions usually lumped together under the phrase «work rules», ranging from seniority systems and grievance procedures to possible protection of malfeasance, can all potentially affect profitability, some positively and some negatively. Finally, there is some evidence that firms change management teams and management systems upon becoming unionized (Clark, 1980), and this could affect profitability, even in ways unrelated to changes in personnel management directly.

The main points of this section are: (i) that the effect of unions on profitability is an empirical question, since even naive theories yield ambiguous predictions, and (ii) the very large number of ways in which unions could potentially affect profitability implies that it is extremely difficult to pin down exactly how this effect, whatever it turns out to be, comes about.

MEASUREMENT PROBLEMS

In contrast to the quote from Freeman and Medoff noted in the introduction to this paper, Caves, et al. (1980, p. 223) state that «profits are highly visible and easily measurable and as a result have probably been the most studied dimension of market performance». As a practical matter, data are available on pre-tax profits and post-tax profits, and the choices facing the researcher are (i) which of these to use, and (ii) whether to adjust them in some way prior to statistical estimation. Regarding the first question, there is precedence in the literature for both approaches, as Clark (1984) uses pre-tax profits and Caves, et al. (1980) use post-tax profits. We decided to use pre-tax profits, under the rationale that they would be less affected by variations in accounting practices among industries. We further use the reported data (from Statistics Canada, 61-207) without adjustment, denoting the variable as PROFIT.

It is useful, however, to note some of the adjustments which could potentially have been made. First, one could conceptually deal with a concept of «total profit» (or perhaps «potential profit»), where some of this represents actual returns to the owners of the firm, some of it represents rents captured by workers (generally through unions) and some of it represents rents squandered in technical inefficiency (Caves, et al., 1980, p. 23). It is obviously a different question to ask whether the total «pie» available to be shared between workers and the owners of the firm is affected by unionization, than it is to ask whether the amount available to the residual claimant is so affected. Although both questions are of interest, we decided to deal with the conceptually simpler one in this paper. We would

note, however, that to the extent that recorded profits provide a «target» for unions, unionized firms may have a greater incentive than nonunionized firms to keep recorded profits low. A simple way of doing this is to spend more than would otherwise be optimal on various inputs.

Second, since there can be considerable year-to-year variation in profits due to unusual circumstances at the firm level such as mergers and takeovers, losing an important lawsuit, etc., it could be argued that some sort of average or moving average of profits would be more appropriate than the actual reported numbers. Although there is some evidence of unusual events even at the aggregated industry level profit and loss statements published by Statistics Canada, we elected not to «premassage» our data in this manner. Finally, one could attempt to adjust the published profit figures by subtracting an estimate of the opportunity cost of capital, in order to get a measure of excess returns. Again, we tried to keep this initial estimation relatively simple, leaving for future extensions the analysis of alternative measures.

Another possible adjustment, which might be handled by incorporating an independent variable in the regressions but which we did not investigate, should also be noted. In Canada industries are characterized by varying degrees of foreign control, making transfer pricing and investment valuation questions potentially important. While of ambiguous sign *a priori*, perhaps a variable representing the proportion of an industry's shipments accounted for by foreign controlled firms would pick up part of this effect. We considered this too tentative an argument to be worth pursuing.

THE CHOICE OF DENOMINATORS

Profitability has previously been measured by some *rate* of profit, i.e. profits divided by some variable such as sales, capital stock, assets, equity, etc. The main reason for doing this is obvious — when firms or industries are of disparate sizes, some adjustment for «scale» is necessary. However, there is also the presumption that whatever the effect of unionization within a given firm is on the level of profits, unionization will have different effects on the different denominators considered, and using various profit *rates* is one simple way of capturing these differences. An alternative approach is to introduce the various «denominators» as independent variables. Since theory does not indicate which is the proper approach, we present results both ways.

We use three denominators: capital stock, denoted CAP (Statistics Canada 13-568), value of shipments, denoted SALES (Statistics Canada

31-203), and total assets, denoted ASSETS (Statistics Canada 61-207)[3]. Although these variables are correlated, the correlations are less than perfect in our sample,[4] and when PROFIT is divided by each of these denominators, the resulting rates of return are surprisingly weakly correlated[5]. We did not use the other commonly used denominator, equity, since we ascribe to Clark's argument (1984, p. 904) that «there is no meaningful distinction between equity and debt capital» for our purposes.

INDEPENDENT VARIABLES

We used eight independent variables in our estimations, defined as follows:[6]

UNION — union membership (71-202)[7], divided by total number of employees (31-203)

SIZE — average establishment size, calculated as value added (31-203), deflated by the implicit GDP deflator for the industry (61-213), divided by number of establishments (31-203).

CFE — cost of fuel and electricity, divided by value added, both from (31-203).

UTIL — capacity utilization rate (31-003)

SEX — proportion of total employees who are female (31-203)

AGE — proportion of total employees who are in the age group 25 — 54 years, linearly interpolated between census dates (94-749 and 92-921).

ELT9 — proportion of total employees with an educational attainment of 9 years or less, linearly interpolated between census dates (94-749 and 92-921).

NPWF — nonproduction workers as a proportion of total employees (31-203).

3 Throughout, we use data relating to the total activity of firms, not manufacturing activity only. This is because the profit data (and some other variables) relate to total activity.

4 The simple correlations are: CAP-SALES, 0.72; CAP-ASSETS, 0.84; and SALES-ASSETS, 0.79.

5 The simple correlations are: (PROFIT/CAP)-(PROFIT/SALES), 0.39; (PROFIT/CAP)-(PROFIT/ASSETS), 0.48; and (PROFIT/SALES)-(PROFIT/ASSETS), 0.60.

6 All data are from Statistics Canada, with catalogue numbers given in parentheses.

7 Statistics Canada reports membership numbers for Textiles, Knitting Mills and Clothing Industries aggregated. We prepared disaggregated estimates using union coverage data in Canada Department of Labour, *Working Conditions in Canadian Industry*. Details are available from the authors on request.

In our simultaneous equation models, we used two other variables, treated as endogenous in estimation. These are:

WAGE = average weekly wages and salaries (72-002) divided by the all items consumer price index (11-003).

VAPE = value added in total activity divided by total number of employees (31-203).

The rationalization underlying most of these variables should be obvious, but we will briefly comment on three of them. CFE is included because our data period (1971-1981) includes both OPEC oil price shocks, which could affect profitability differentially among industries, depending upon their energy intensity. SIZE is a proxy for several effects including market power, scale economies and barriers to entry. We follow Clark (1984) in introducing worker characteristics (SEX, AGE, ELT9 and NPWF) in the reduced form profit equations, since if these characteristics affect productivity and thus profitability, while also serving as determinants of unionization, their omission could seriously bias the estimations for the coefficient of the UNION variable. Since the decimal points in many of these variables were placed where convenient in the data gathering procedure, the means, standard deviations and units of all variables used are presented in Table 1.

Obviously, many more variables could have been included, and it may be useful to note some potential omissions. *Ceteris paribus,* one might expect those industries which enjoy relatively high tariff and non-tariff protection against foreign competition to have relatively high profits. Alternatively, if the political process which grants such protection is economically rational, one would expect that only «infant industries» which need such protection, i.e. those with relatively low profit levels, would receive it. Given the theoretical ambiguity of the effect, we did not experiment with it. Previous studies (Caves, et al. 1980) have argued that some advertising related variable, such as the advertising-sales ratio, might be important. However, they introduced this variable only multiplied times either imports or exports (pp. 229 and 233), leading to the suspicion that it may not be important by itself. In the interest of keeping our estimations simple, we did not experiment with advertising variables. Further, the inclusion of such variables would very likely introduce collinearity with the SIZE variable via concentration and entry barrier effects.

Finally, one could argue that the variable SIZE is not sufficient to capture all of the effects we claim it is picking up. We experimented with a weighted four-firm concentration ratio based on shipments (Statistics Canada, 31-402), and found (i) the results were not much different when it was included, and (ii) statistical significance for the variable was weak. In

TABLE 1

Means and Standard Deviations of Variables

Variable	*Mean*	*Standard Deviation*
PROFIT	452.152	518.073
PROFIT/CAP	0.214	0.141
PROFIT/SALES	0.074	0.046
PROFIT/ASSETS	0.090	0.031
CAP	2965.086	3397.560
SALES	6237.814	6485.078
ASSETS	4742.163	4587.148
WAGE	152.471	33.242
VAPE	16.788	6.538
UNION	0.446	0.155
SIZE	2040.660	2544.264
CFE	0.045	0.045
UTIL	83.769	7.425
SEX	0.283	0.187
AGE	0.647	0.041
ELT9	0.269	0.114
NPWF	0.273	0.117

Note: The units of the variables are as follows: PROFIT, CAP, SALES and ASSETS are in millions of dollars; VAPE and SIZE are in thousands of dollars; UTIL is a percentage, and all other variables are proportions.

particular, the t values for the coefficients of UNION retained statistical significance in the presence of the concentration variable. These results may have been due to the fact that for several industries, observations were missing, which we estimated by linear interpolation.

ESTIMATION RESULTS

Treating unionization as exogenous, and hence estimating a reduced form model by ordinary least squares, the estimation results are shown in Table 2. Two functional forms are used: (i) using PROFIT as the dependent variable and correcting for scale by entering CAP, SALES or ASSETS on the right hand side of the equation, and (ii) dividing PROFIT by CAP, SALES or ASSETS to obtain a dependent variable which is a profit *rate*. The first set of estimates (equations 1-3) indicates a negative and significant effect of unions on profits, consistent with the previous literature. Equation 4 indicates a negative and significant effect on the rate of return on capital, also consistent with the literature; and equation 5 indicates a similar effect on the rate of return on sales, which is not consistent with Freeman and Medoff (1981, p. 63). Finally equation 6 shows a weak positive effect of unions on the rate of return on assets, with a nonsignificant t value.

Interpreting the magnitudes of the estimated effects, we will make all comparisons in terms of an increase of UNION of 0.1, e.g. an increase in unionization from 40 per cent to 50 per cent. Since our data set contains no observations near zero or unity (remember we define UNION in terms of total employees, not production workers only), we do not feel confident in comparisons between no unionization and complete unionization based on our estimation. At the mean level of PROFIT, equation 1 implies a 0.1 increase in UNION will decrease profits by 13 per cent, equation 2 implies 21 per cent, and equation 3 implies 9 per cent. These are all large estimated effects. At the means of both variables, the elasticity of PROFIT to UNION ranges from 0.4 to 0.9 for equations 1-3.

Equation 4 predicts an increase in UNION of 0.1 will decrease the rate of return on capital by 0.03, while the sample mean (Table 1) is 0.214. Multiplying the 0.03 estimate times the mean of CAP and expressing this as a percentage of the mean of PROFIT, yields 20 percent[8]. Multiplying 0.01 (from equation 5) times the mean of SALES and expressing this as a percentage of the mean of PROFIT yields 14 per cent. Performing the same com-

8 If the 4-firm concentration ratio based on shipments is included in equation 4, the coefficient for UNION is -0.28 with an associated t value of -3.84. The results of including this variable in other equations are similar in terms of magnitude of difference.

TABLE 2

Regression Results — Reduced Form Models*
Dependent Variable (Equation Number)

Ind. Var.	*PROFIT*	*PROFIT*	*PROFIT*	*PROFIT CAP*	*PROFIT SALES*	*PROFIT ASSETS*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
Const.	-836.78	350.27	-296.53	-0.33	0.04	0.06
	(-1.41)	(0.63)	(-0.86)	(-1.76)	(0.69)	(1.33)
UNION	-606.28	-955.58	-429.20	-0.30	-0.10	0.02
	(-2.66)	(-4.17)	(-3.29)	(-4.29)	(-4.97)	(1.33)
SIZE	0.02	0.05	0.02	0.23E-4	0.95E-5	0.15E-5
	(1.49)	(4.09)	(2.03)	(5.42)	(7.53)	(1.33)
CFE	-2106.30	4169.38	-366.34	-0.97	0.25	-0.11
	(-2.83)	(7.86)	(-1.01)	(-5.40)	(4.64)	(-2.34)
UTIL	10.05	7.79	8.01	0.34E-2	0.15E-2	0.01
	(3.25)	(2.61)	(4.36)	(3.39)	(4.99)	(5.47)
SEX	-278.00	-68.74	-85.97	0.20	-0.04	-0.01
	(-1.76)	(0.45)	(0.92)	(3.99)	(-2.49)	(-0.81)
AGE	411.74	-1158.52	-518.69	0.74	-0.14	-0.15
	(0.49)	(-1.46)	(-1.06)	(2.78)	(-1.82)	(-2.21)
ELT9	95.15	-318.51	186.65	-0.21	-0.98E-2	-0.08
	(0.29)	(-1.05)	(0.99)	(-2.15)	(-0.33)	(-3.12)
NPWF	645.07	472.42	177.69	-0.33	9.12	0.08
	(1.85)	(1.39)	(0.85)	(-2.94)	(3.59)	(2.67)
CAP	0.13					
	(12.16)					
SALES		0.05				
		(13.11)				
ASSETS			0.11			
			(28.30)			
R^2	0.67	0.69	0.88	0.53	0.61	0.35

* Student's t values in parentheses.

putations using the coefficient from equation 6 yields an increase in PROFIT of 2 per cent of the mean.

Thus, all of the estimations in Table 2 indicate substantial negative effects of unionization on profits except for equation 6. Further, the R^2 value for equation 6 is substantially lower than for the other equations. The reasons for this are not clear. Visual inspection of the rate of return on assets data disclosed no glaring outliers, and as indicated in Table 1, this variable has the *lowest* variance of any of the three rate of return measures. We regard equation 6 as a useful indication of the sensitivity of our results (Leamer, 1985).

The reduced form equations in Table 2 give no information on *how* the effect estimated came about. In an attempt to get some handle on this, we estimated a multiequation model. The basic idea was to determine whether the effect operated through the effect of unions on wages and labour productivity, or through some other channels. We thus specified an equation where the rate of return depended upon WAGE, VAPE and UNION (together with exogenous variables), interpreting a significant coefficient for UNION as evidence the effect operates through some channels other than wages and/or productivity. A second equation in the model made WAGE a function of UNION and VAPE (with exogenous variables), and a third equation made VAPE a function of UNION (and exogenous variables). The fourth and final equation made UNION a function of WAGE and exogenous variables.

There are thus four endogenous variables in the model: a rate of return measure, WAGE, VAPE and UNION; and seven exogenous variables: SIZE, CFE, UTIL, SEX, AGE, ELT9 and NPWF. The final specification of the model was obtained by excluding exogenous variables from equations on intuitive grounds, estimating, and then dropping additional exogenous variables one at a time until all t values were over unity. This specification search was conducted using PROFIT/CAP, and then the same model was estimated using the other two rates of return. The final specification, and estimation results, are shown in Table 3[9].

Equation 10 indicates real wages are positively affected by unionization, with a union differential of $26.59 per week, or 17 per cent of the mean of WAGE, which is a realistic estimate given the literature[10]. Equation 11 indicates labour productivity is also positively affected by unionization,

9 Although R^2 values from 2SLS estimations do not have the same interpretation as those from OLS estimation, we report them in Table 3 to give some indication that the «fits» for the rate of return equations are not very good.

10 Recall our previous comment about the reliability of comparing zero to total unionization in our data set. We present this calculation for easy comparability with other estimates in the literature.

TABLE 3

2SLS Regression Results — Multi-Equation Models*
Dependent Variable (Equation Number)

Ind.	PROFIT CAP (7)	PROFIT SALES (8)	PROFIT ASSETS (9)	WAGE (10)	VAPE (11)	UNION (12)
Const.	0.21	-0.08	-0.08	127.76	-46.64	0.03
	(1.33)	(-1.97)	(-2.55)	(26.50)	(-6.99)	(0.31)
UNION	0.04	-0.08	-0.05	26.59	2.70	
	(0.58)	(-4.32)	(-3.11)	(3.02)	(0.89)	
WAGE	-0.31E-2	0.11E-4	0.48E-3			0.39E-2
	(-3.84)	(0.06)	(2.96)			(9.03)
VAPE	0.02	0.50E-2	-0.71E-4	2.96		
	(5.37)	(5.28)	(-0.09)	(16.63)		
SIZE						0.16E-4
						(4.38)
CFE	-1.07	0.18	-0.14			
	(-4.03)	(2.71)	(-2.60)			
UTIL	0.19E-2	0.11E-2	0.15E-2		0.06	
	(1.33)	(3.27)	(5.36)		(1.59)	
SEX				-67.90		
				(-12.14)		
AGE					94.62	
					(9.59)	
ELT9				-63.83	-15.62	0.35
				(-5.47)	(-4.36)	(3.15)
NPWF						-1.11
						(-11.72)
R^2	0.20	0.22	0.30	0.89	0.60	0.59

* Student's t values in parentheses

but the effect is not statistically significant at any conventional level. The magnitude of the coefficient is 16 per cent of the mean of VAPE, indicating almost offsetting effects of unionism on wages and labour productivity, a result previously noted by Brown and Medoff (1978). Equation 12 indicates unionization is strongly affected by WAGE, a result previously reported in Maki and Christensen (1980).

Turning to the results of primary interest, equation 7 indicates the rate of return on capital is negatively related to WAGE and positively related to VAPE, both effects being strongly significant. The coefficient of UNION is positive, but small in magnitude and not significant at any conventional level. Hence, this equation indicates that the effect of unions on profitability operates exclusively through wages and labour productivity, and not through other channels. The magnitude of the overall effect of an increase in UNION of 0.1 can be estimated as follows: 2.659(-0.0031) + 0.27(0.02) + 0.004 = 0.0012, a positive number. Multiplying this times the mean of CAP and expressing the result as a percentage of the mean of PROFIT yields 0.8 per cent. Thus, abstracting from significance levels, equation 7 implies almost no effect of unions on the rate of return to capital.

Equation 8, which uses the rate of return on sales as the dependent variable, indicates no significant effect of WAGE on profitability, with a positive and significant effect for VAPE and a negative and significant direct effect for UNION. This estimation thus suggests that if there is a negative effect, it operates through channels other than effects on wages and labour productivity. Calculating the overall effect of an increase in UNION of 0.1 as before:[11] 2.659(0.000011) + 0.27(0.005) - 0.08 = -0.0066. Multiplying this times the mean of SALES and expressing the result as a percentage of the mean of PROFIT yields 9 per cent, a smaller estimate than obtained from reduced form equation 5 of Table 2.

Finally, equation 9, which uses the rate of return on assets as the dependent variable, yields unexpected signs on both WAGE and VAPE, with a large t value for the former. The direct effect of UNION is again negative, indicating that any negative effect on profitability operates through channels other than wages and labour productivity. Calculating the overall effect of a change in UNION of 0.1 for this equation yields -0.0037, which when multiplied times the mean of ASSETS and expressed as a percentage of the mean of PROFIT is about 4 per cent.

11 Given the structure of the model, the estimates of equations 10-12 do not change when different profit rate equations are substituted in the model.

INTERPRETATION AND CONCLUSIONS

We thus have 9 estimates of the effect of unions on profitability, with 7 of these negative and 2 (equations 6 and 7) positive. Both of the positive estimates are small in absolute value relative to the magnitudes of the estimated negative effects. Further, there is wide variation in the magnitudes of the estimated negative effects. Hence, we have not been very successful in pinning down the size of the effect, and there is even contrary evidence regarding the sign.

Given this, it is not surprising that we were unsuccessful in isolating the channels through which the effect (if there is one) operates. Equation 7 provides one answer to the question — all effects operate through wages and labour productivity, and these effects are offsetting, leaving an overall effect near zero. Equations 8 and 9 provide a different story — there is a negative effect operating through channels other than wages and labour productivity — but this story is unreliable due to wrong signs on the wage and/or productivity variables.

Despite this lack of conclusiveness in our results, we present them for the benefit of other researchers who find the questions addressed interesting. Only through considerable replication will a better understanding of the effects of unions on profitability emerge (Mayer, 1980).

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L'influence des syndicats sur le niveau des profits la situation canadienne

Malgré la grande quantité d'études qui ont analysé l'influence des syndicats sur nombre de variables, l'effet qu'ils ont eu sur les profits n'a guère attiré l'attention. On peut attribuer cette omission à certaines appréhensions concernant l'exactitude des données disponibles sur les profits ou au manque de conséquences politiques perceptibles pouvant découler des réponses apportées à cette question. Un article récent de Clark (1984), où sont utilisées des statistiques américaines, soulève deux questions intéressantes: 1. l'influence des syndicats sur les profits peut varier selon le dénominateur choisi pour établir le taux et 2. l'importance de savoir si l'effet sur les profits n'opère que par les voies suggérées par la théorie néoclassique ou, au moins en partie, par d'autres voies proposées par la théorie de la négociation.

En utilisant les statistiques provenant de vingt grandes industries manufacturières compilées pendant la période 1971-1981, le présent article analyse l'influence des syndicats sur plusieurs mesures du profit. Les mesures retenues sont le niveau des profits, et le taux de rendement sur le capital, les ventes et les actifs. Dans chaque cas deux modèles sont estimés: équation de forme réduite (MCO) et équations simultanées (MC2E). Ces estimations ont pour but de chercher à répondre aux deux questions suivantes. La première de ces questions consiste dans l'ampleur de l'influence et la deuxième se demande si l'effet, s'il y en a un, provient totalement des salaires et de la productivité du travail comme le suggère la théorie néoclassique ou si l'effet opère au moins en partie par d'autres voies comme le soutient la théorie de la négociation.

Trois modèles réduits de formulation du niveau des profits indiquent, d'un point de vue statistique, des effets négatifs significatifs d'une ampleur de changement de 9 à 21 pour cent du niveau moyen des profits causés par une augmentation de dix points de pourcentage dans le degré de syndicalisation. Trois modèles réduits des divers taux de rendement donnent des effets négatifs significatifs dans l'éventail antérieurement noté pour les taux de rendement sur le capital et les ventes, mais un léger effet positif non-significatif en ce qui a trait au taux de rendement sur les actifs.

Quatre modèles d'équation simultanée, à partir des mêmes variables que les modèles réduits, ont été ensuite mis au point pour évaluer les voies ou les canaux par lesquels l'effet de la pénétration syndicale agit sur les profits. Le processus fondé sur le taux de rendement sur le capital démontre que les syndicats influencent les salaires et la productivité d'une façon positive à peu près également sans autres effets sur les profits, d'où un effet nul dans l'ensemble. Le processus fondé sur le taux de rendement sur les ventes et les actifs démontre des effets généralement négatifs qui agissent presque totalement par les voies ou les canaux néo-classiques. Ces deux dernières estimations sont cependant faussées par des signes erronés en ce qui concerne le salaire et la productivité.

On peut conclure, à tout prendre, que les constatations tendent vers un effet négatif de la syndicalisation sur les profits, mais il a été impossible d'obtenir une vision nette de la manière dont cette influence agit.