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UNIONISM, PRICE-COST MARGINS, AND THE RETURN TO CAPITAL

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ABSTRACT

This paper examines available industry data on two profitability measures, the price-cost margin and the ratio of quasi-rents to capital, for the purpose of determining the effect of unionism on profits. It finds that unionism reduces profitability and that this effect occurs in highly concentrated industries. The effect of unionism is quite substantial in most calculations, suggesting that the fraction organized in a sector be included in standard Industrial Organization profitability calculations in the future.

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Despite a widespread belief among economists and businessmen that trade unionism is inimical to profitability, neither labor economists nor industrial organization specialists have seriously examined the relation of industry profits to organization of the labor force.[1] Since, in theory, the effect of unionism on profitability is ambiguous -- in some market situations unionism can raise profits by acting as the monopolizing agent while in others it should have no effect -- it is important to test the widespread belief and to estimate the magnitude of the relation.

This paper seeks to fill the gap in our knowledge by analyzing the impact of unionism on the profitability variables studied in industrial organization, 'price-cost margins,' and quasi-rent returns to capital as reflected in revenues minus costs per dollar of assets. It uses two major bodies of data: the Internal Revenue Service balance sheet data and the annual Survey of Manufacturing.

The major finding is that unionism has a statistically significant quantitatively important depressant impact upon the relevant profit indicators that holds up under various specifications and is as or more robust than the widely-studied impact of concentration on industrial profitability. In addition, the analysis shows that the negative effect of unionism on industry profits is limited to the more concentrated industries.

The finding that unionism reduces profits helps explain extensive management opposition to unionism, despite the often higher productivity associated with organization (see Brown and Medoff, Clark,

Allen). Apparently managerial and union productivity or price augmenting behavior is generally, though not always, insufficient to counterbalance the higher cost of union labor.

1. What Theory Says

While most economists would expect the wage increases due to unionism to reduce profitability, such an effect is by no means theoretically certain. Even in situations where all that unions do is to raise labor costs, the effect on profitability depends on: the period of analysis, market structure in the organized sector, and the profitability measure under study.[2] When firms are not operating at optimal efficiency so that unionism is accompanied by productivity advances as well as cost increases there is even greater ambiguity to the profit effect. Moreover, when part of a sector is organized and part is not, profitability is likely to be increased in the nonunion part, raising the likelihood that industry profits will be higher.

Consider first the issues of market structure and the time period of analysis. If a union organizes a competitive sector and raises costs, it can either increase or decrease profits in the short-run, depending on the demand and cost conditions in the sector. Profits are likely to increase if the demand curve facing the sector is inelastic, so that increases in costs which raise prices, also raise total revenues. Essentially, union cost increases can bring the industry closer to the price/output position of a monopoly in the sector, with the monopoly profits divided between the union and the

firms. To illustrate, let P = price, Q = quantity, W = wage, L = labor, and let production be governed by $Q = L^{\alpha} K^{1-\alpha}$ where K is fixed. Then profits (π) are

$$(1) \quad \pi = PQ - WQ^{1/\alpha}$$

If the sector is competitive price is equated to marginal cost

$$(2) \quad P = W \, dL/dQ = W/\alpha \, Q^{1/\alpha - 1}$$

Substitution for $WQ^{1/\alpha}$ in (1) yields

$$(3) \quad \pi = (1 - \alpha) PQ$$

Here profits will rise in the sector whenever demand is inelastic. (See Nelson 1957, for a general analysis). In the long run, with free exit and entry, however, the reduction in profits will reduce the number of firms and output until profitability is restored to 'competitive levels.'

By contrast, if the industry is already acting as if it was a perfect monopoly, the union wage increase cannot raise profits. It will necessarily reduce them since the monopolist is in the elastic part of the demand curve. In this case, the union profit effect can continue in the long run, as long as market conditions remain the same. Profits will be reduced relative to what they would be in the monopolistic sector in the absence of unionism but, assuming free exit, will not fall below the competitive level.

In a recent paper Clark has pointed out that the effect of union wage increases on profitability depend also on the measure of profits used. In particular, he notes the 'anomalous' result in which unionism lowers profits in a sector but where the ratio of profits to

capital rises. In his case the decline in profits reduces the size of the sector, with capital usage declining less in percentage terms than does the level of profits, a result requiring an elasticity of substitution less than one.[3] In this case, profits divided by the original capital stock are lower but profits divided by the capital stock after adjustment are higher under unionism. By focusing on the latter measure rather than the former one ignores capital losses to fixed factors. The result does not imply that monopolies with low elasticities of substitution will raise factor prices to raise profitability: their concern is with total profits, not profits per plant and equipment capital.

In sum, theoretical considerations suggest that one be careful in analyzing the union-profitability relation, distinguishing between sectors with different market conditions and between profit measures.

In this study I treat the market conditions issue by differentiating between more and less concentrated sectors. While there are well-known problems with concentration as a measure of market power, it is the most widely studied indicator of market power and is generally found to have a moderate but persistent positive relation to profitability measures (see Weiss), which even critics of the standard interpretation of the concentration-profit relation admit (Peltzman). I report some results with other market structure variables found in the industrial organization literature, but as these yield comparable findings with respect to unionism, I shall not place great stress on them.

For profitability, I employ the 'price-cost margin,' (PCM) defined as value added less labor costs (and less advertising costs) divided by the value of shipments, and quasi-rents per unit of capital, (QRC) defined as value added less labor (and advertising) costs per dollar of asset. The price-cost margin is generally interpreted in the industrial organization literature as a measure of the extent to which a monopolistic sector raises prices over costs (capital held fixed) beyond competitive levels. In a simple monopoly model the price-cost margin depends on the elasticity of demand η: $[P/C = 1/(1 - 1/\eta)]$. Alternatively the price-cost margin can be thought of as a measure of profits per unit of sales. Despite criticisms of the PCM as a profit indicator on various grounds (see Liebowitz), it continues to be widely used, in part because it represents the best profitability measure in the Census of Manufacturers and appears to yield similar correlations with profit determinants as do quasi-rents per unit of capital.

While the QRC measure of profits has some desirable features, in that it represents a return on capital, it also suffers from serious drawbacks. It is <u>not</u> a rate of return in the theoretical sense of an internal return. It involves division of profits by capital/asset measures of questionable quality, due to capital stock valuation, omission of intangibles (in the Survey of Manufacturers) and other well-known problems (see L. Weiss).

Given the weakness of each measure of profitability, I examine the impact of unionism on both and contrast results with those obtained on the standard Industrial Organization variables in each case.

2. Data

The empirical analysis uses two data sets containing measures of profits or quasi-rents, capital, market structure, and unionization of the labor force:

(a) Survey of Manufacturing (SOM) data, 1958-1976. The first data set consists of a pooled cross section time series of observations on 139 three digit industries from the annual Survey of Manufacturing. The Survey presents data on value added, value shipments and labor cost to measure the price-cost margin and measure of quasi-rents. I augment this data series with: estimates on capital in each industry-year cell using data reported by the Bureau of Labor Statistics, as described in detail in the data appendix, estimates of three digit concentration ratios, obtained as weighted averages of four digit rates, estimates of the following other market structure variables, obtained from the Harvard University (PICA) data bank: minimum efficient scale, cost disadvantage ratio, advertising/sales ratio, and absolute capital requirements. The unionism variable is obtained from the Freeman-Medoff estimates for three digit industries, based on May Current Population Survey data.

The three digit SOM data set has both advantages and disadvantages for analysis. On the plus side it provides a consistent series of 'quasi-rents' and capital measures unaffected by changes in tax laws or distorted by inflation for a large number of industries. On the negative side the measure of 'quasi-rents' includes overhead expenses while the measure of capital stock excludes all assets except

for plant and equipment. Furthermore the data are limited to manufacturing which has become an increasingly smaller component of U.S. national product.

(b) Internal Revenue Service (IRS) data on balance sheets and assets in 68 industries from 1965 to 1976. From the IRS balance sheets we have calculated a cash flow measure of profits: reported profits before taxes plus depreciation plus interest payment, and obtained total assets and net depreciable assets. The industry concentration and unionism variables are taken from the same sources as in the Survey of Manufacturing data, but are bridged to correspond with the IRS industry definitions.

The IRS data set addresses some of the problems in the SOM data set but also introduces new ones. IRS data yield a quasi-rent measure that approximates payments to capital instead of contributions to overhead. And the data yield capital measures ranging from stock of plant and equipment to total assets. On the negative side, industrial organization experts cite three major problems (see L.W. Weiss) One, accounting and managerial policy tend to equalize profit rates among industries. Two, inflation distorts capital stock valuation. Three, IRS reports company and not establishment data. Therefore, market structure variables reflect conditions in the companies' most important industry but not conditions in other markets of diversified firms.

The precise definitions of the variables used are given in the data appendix.

Table 1 presents the means and standard deviations of the major variables in the analysis and, to provide a guide to ensuing work, the multivariate relationship between each of the variables and unionism as reflected in the regression coefficient on unionism and the implied level of the variable at 0% and 100% organization. These figures are not meant to estimate the structural impact of unionism on the relevant variables but simply to show how they vary with unionism in the samples.

While there are differences in levels of variables due to different definitions and groupings, the two data sets tell a similar story about the magnitude, variability, and link to unionism of the key variables.

First, the table shows considerable variation in the major profitability indicators, the price-cost margin and quasi-rents per unit of capital, providing the differences among industries necessary for a fruitful analysis. The levels of the profitability measures do, however, differ greatly between the data sets, with both the price-cost margin and quasi-rents per capital higher in the SOM than in the IRS. In the price cost margin this reflects lack of data on some costs in the SOM, while in the quasi-rent/capital measure it also reflects lack of a complete accounting of the capital stock in the SOM data: taking net depreciable assets as an indication of the plant and equipment capital in the SOM, upwards of three-fourths of manufacturing assets are not included in the SOM figure.[4] Because of these factors, the 'price-cost' margin, which is capital's share of value shipment in the

TABLE 1: DATA MEANS AND STANDARD DEVIATIONS OF MAJOR VARIABLES

Three Digit Survey of Manufacturers Data*	Mean	S.D.	Regression Coefficient (Standard Error) for Percentage Unionized	Effect at Organization Level of 0%	Effect at Organization Level of 100%
Log Quasi-rents (Value Added - Labor Costs - Advertising Costs)	6.17	1.28	.55 (.12)	5.93	6.48
Log Price-Cost Margin (Quasi-rents / Value Shipments)	-1.62	.367	-.15 (.03)	-1.55	-1.70
Log Quasi-rents per Capital[1]	-.32	.62	-.31 (.06)	-.18	-.49
Log Capital per Worker	2.198	.853	.80 (.08)	1.88	2.68
Log Labor Cost per Worker	2.170	.254	.34 (.02)	2.03	2.37
Log Value Added per Worker	2.79	.415	.408 (.038)	2.62	3.03
Concentration	.50	.19	.19 (.02)	.419	.611
Unionization	.45	.21	-	-	-
IRS Data Set**					
Log Quasi-rents (Revenue plus interest plus depreciation les cost deductions)	13.54	.860	-.24 (.18)	13.65	13.41
Log Price-Cost Margin (Quasi-rents / Business Revenues)	-2.31	.338	-.45 (.080)	-2.11	-2.56
Log Quasi-rent / Capital	-1.96	.29	-.37 (.06)	-1.80	-2.17
Log Capital per Sales	-.35	.31	-.08 (.06)	-.31	-.39
Concentration	.54	.17	.224 (.035)	.436	.66
Unionization	.46	.17	-	-	-

* millions of dollars

** thousands of dollars

1. Capital measured in 1972 dollars

SOM, averages 19% in that data set while quasi-rents per capital are 73%. These figures far exceed the comparable statistics from national income accounts, a well-known result indicative of the aforementioned data problems (see Brown and Medoff). Despite the problems, however, the SOM data are valuable in providing a large number of industries and years for analysis, we will develop a somewhat novel model to treat the data problems.

Nearly all of the variables are correlated with unionism. With one exception the correlations are in the expected direction, though not of the same magnitude or significance, in the two data sets. The exception is the gross value of log quasi-rents, which is positively correlated with unionism in the SOM, a result due to the industry classification scheme as larger industries tend to be more heavily unionized in that data set. More importantly, the SOM and IRS data show negative correlations between the relative profitability measures and unionism which, however, are noticeably stronger in the IRS than in the SOM data.

The capital intensity measures, capital per worker in the SOM, capital per sales in the IRS, are positively correlated with unionism, as we would expect. The labor cost per worker and value added per worker data in the SOM show that unionized industries pay more for labor and have higher 'gross' productivity.

Without claiming the data are optimal for examining the impact of unionism on profitability, I believe they are adequate to provide at least a crude indication of the linkage between collective organization

in the labor market and profitability, on a par with studies of concentration and other measures of the structure of the product market and profitability which use essentially the same data sources.

3. Empirical Analysis

Table 2 presents the results of a multivariate analysis of the impact of unionism on profitability in the IRS data set. Regardless of the measure of profits or control variables, the calculations tell a clearcut story, showing that unionism reduces profits by significant sizeable amounts.

Taking the quasi-rents/capital regression first we see in equation (1) that unionism lowers profits per unit of assets by some 61% (= 1 - exp(-.49)) as one moves from 0% to 100% organization. Equation (2) introduces a union concentration interaction term to see if the negative effect of unionism on profitability is, as expected, greater in the more concentrated sectors. The interaction term enters significantly, supporting this hypothesis. Equation (3) shows that the negative effect of unionism does not disappear with addition of three other widely used measures of product market structures.[4]

The result with respect to the price-cost margin in equations 4 - 6 are similar.

Table 3 presents a comparable analysis of profitability in the Survey of Manufacturers data set. Here, the results with respect to the price-cost margin parallel those given in the previous table: unionism reduces profits, concentration raises profits, and there is a

TABLE 2: Regression Coefficients and Standard Errors for Profitability Equations in IRS Data Set

	Log Quasi-Rents/Capital			Log Price-Cost Margin		
	(1)	(2)	(3)	(4)	(5)	(6)
1. Unionism	-.49	-.01	-.45	-.58	-.32	-.53
	(.05)	(.17)	(.05)	(.05)	(.16)	(.05)
2. Concentration	.39	.73	.34	.72	.89	.61
	(.05)	(.13)	(.06)	(.06)	(.12)	(.06)
3. Capital/Business Receipts				.68	.68	.74
				(.01)	(.03)	(.03)
4. Unionism · Concentration		-.76			-.40	
		(.36)			(.25)	
5. Other Market Structure Variables						
Advertising Intensity			3.06			2.28
			(.46)			(.48)
Absolute Capital Requirements			.95			.79
			(.18)			(.18)
Relative Minimum Effect Scale			-.15			-.11
			(.03)			(.03)
6. R^2	.32	.33	.40	.66	.66	.64

Note: All regressions include year dummies.

TABLE 3: Regression Coefficients and Standard Errors for Profitability Equations in Survey of Manufacturers Data Set

	Log Quasi-Rents/Capital			Log Price-Cost Margin		
	(1)	(2)	(3)	(4)	(5)	(6)
1. Unionism	-.14	1.35	-.08	-.21	.03	-.16
	(.05)	(.15)	(.05)	(.03)	(.09)	(.03)
2. Concentration	-.90	.41	-1.23	.22	.64	-.05
	(.06)	(.14)	(.07)	(.04)	(.08)	(.04)
3. Capital/Value of Shipment				.17	.19	.21
				(.01)	(.01)	(.01)
4. Unionism · Concentration		-2.72			-.93	
		(.25)			(.15)	
5. Other Market Structure Variables						
Advertising Intensity			5.59			6.18
			(.31)			(.32)
Absolute Capital Requirements			.54			.14
			(.09)			(.05)
Relative Minimum Effect Scale			-.96			.19
			(.19)			(.11)
6. R^2	.11	.15	.23	.17	.23	.29

Note: All regressions include year dummy variables.

noticeable interactive effect. Addition of the other market structure variables weakens the concentration variable much more than it did in the IRS data but does not greatly affect the union impact. The results with respect to the quasi-rent/capital measure of profitability differ, however, in one remarkable respect. Whereas unionism continues to have a negative estimated impact on profitability, so too does concentration. Indeed, the negative relation between concentration and profitability with this measure is extraordinarily strong. Why? My first fear was that I made a gross error with the SOM data. After all, a relation like this has certainly not been reported in the Industrial Organization literature. Several careful data checks uncovered no such gruesome error. Examination of the literature found that one reason for the lack of such a result in previous studies is that nearly all analysts using the Survey of Manufacturers data focus on price-cost margins, not the quasi-rent to capital return. The one study which did, indeed, analyze the QRC, by Lester Telser, reports negative correlations between 'contribution to overhead' and concentration of a magnitude similar to that in my data set. Telser deals with the problem by including 'payroll' as an additional capital measure in the regressions. He argues that the standard plant and equipment capital in the Survey is seriously incomplete by omission of intangible 'specific human capital,' which can be roughly measured by payroll. Indeed, with addition of payroll, the positive relation between the QRC and concentration is reversed. However, holding payroll fixed essentially turns the QRC regression in a PCM equation.[5] While this

raises doubts about interpretation of Telser's regressions, I believe the explanation of the aberrant finding does indeed rest on 'missing' capital. If a significant amount of capital relevant to profitability is omitted from the Survey of Manufacturers data, and if this capital is negatively correlated with concentration, and is positively correlated with profitability, the negative result in the QRC regression could be attributed to the missing capital. Calculation with the IRS data, which contains depreciable assets comparable to the plant and equipment capital in the Survey of Manufacturers supports the interpretation. First, the IRS data show that only 1/4 of total assets are depreciable assets (the rest include inventories, intangible assets, land, etc.),[6] which suggests considerable 'missing' capital. Second, the log of the ratio of depreciable to total assets is highly significantly correlated with concentration: a regression coefficient (standard error) of .51 (.07), whereas unionism is barely correlated with the ratio [.09 (.08)]. Third, the nondepreciable assets in the IRS are correlated with profitability just as are the depreciable assets.

As a test of the explanation, I re-estimated the QRC regression in the IRS data, replacing total assets by depreciable assets. If the essence of the problem lies with use of depreciable rather than total assets, one should obtain a negative concentration-QRC relation in the IRS data in this case. Indeed, the results show just such an effect, with a coefficient on concentration of -.13 (.08) compared to the .39 (.01) obtained in Table 2. The union coefficient, by contrast, remains

highly significantly negative.

There are two ways to adjust the SOM data for the missing part of capital. One could use the IRS data to obtain the relevant auxiliary regression coefficients to 'correct' the SOM results using omitted variable bias formulae. Alternatively, one can modify the profitability model to allow for an unmeasured capital effect on profits. As the latter gives greater leeway to the SOM data to tell the story, I follow this procedure.

An appropriate generalization of the profitability equation used in the SOM regressions is:

$$(4) \quad \pi = a + bK + cUN + dCONC + eKCONC + fKUN$$

where π = quasi-rents

K = capital

UN = extent of unionization

CONC = concentration ratio

In (4) measured capital produces quasi-rents according to the coefficient b and the coefficients on the interaction terms between K and unionism and concentration. The coefficient f reflects the impact of unionism on the return to capital, with b + fUN measuring the marginal impact of a dollar of measured capital on quasi-rents, while the coefficient e reflects the impact of concentration on return to capital. Unionism, concentration and a constant enter the equation to allow for unmeasured capital and the possibility that either is related to the amount or the returns to that capital: if the coefficients c and d are negative (positive), we would infer that these is less (more)

unmeasured capital, or that the unmeasured capital has a lower (higher) return in the more concentrated or unionized sectors.

Table 4 records the result of estimating (1) in the SOM data. Consistent with our explanation of the aberrant concentration result, it shows a sizeable negative direct effect of concentration on the log of quasi-rents but a sizeable positive interaction with capital. The estimated union effects are exactly the opposite, as might be expected. The effects of the variables at the bottom of the table show that, at the mean value of capital, unionism reduces quasi-rents while so too does concentration, consistent with the Table 3 findings.

Whether one does or does not accept this explanation of the aberrant concentration-profitability result in the Survey of Manufacturers, the important point is that even in that calculation the union effect is negative and interacts negatively with concentration.

3. Assessing the Union-Profitability Relation

Granted that unionism has a negative effect on profitability and that its effect differs between more and less concentrated industries, is the effect limited to highly concentrated sectors where profitability would otherwise be extremely high or do unions also reduce profits below normal levels in competitive industries? A priori one expects the negative union impact on profits to be especially sizeable and in the long run limited to concentrated or regulated sectors, because a union profit effect in a truly competitive sector would bring in nonunion competitors and drive union firms out of

TABLE 4: Estimated of Determinants of Quasi-Rents in Survey of Manufacturers Data

Union	2.08 (.23)
Concentration	-2.59 (.22)
Capital	.82 (.02)
Union · Capital	-.36 (.04)
Concentration · Capital	.36 (.03)
R^2	.832
Effect of variable on return to measured capital	
Unionism	-.36
Concentration	.36
Effect of variable on total quasi-rents at mean value of capital	
Unionism	-.24
Concentration	-.25

business.[6]

To see how unionism affects profitability in different types of industries I have estimated the profitability regressions using a four-way classification of industries in place of unionism and concentration, dividing industries into roughly equally numbered sets as follows: low unionism - high concentration, high unionism - high concentration, high unionism - low concentration, and low unionism - low concentration.

Table 5 presents the results of these regressions in terms of the estimated ln point difference in profitability between the high unionism and low unionism parts of low and high concentrated sectors. The results are clear: unionism has essentially no impact on profitability in the more competitive sectors but a sizeable negative effect in the concentrated industries. In all cases the highest profitability is obtained for the high concentration - low unionism set of industries. In all but the aberrant quasi-rent to capital Survey of Manufacturers regression, moreover, the reduction in profitability in the high concentration - high unionism sectors is to πnormalπ low concentrated profit rates.[7]

While the profitability calculations indicate that unionism reduces profits only in sectors whose industry market power creates above-normal profits, it is still possible that there is a union effect on competitive industries. Assume unionism reduces profitability in the competitive sector, which drives out less efficient union firms. If, as seems plausible, our data cover a period in which industries

TABLE 5: The Differential Effects of Unionism on Profitability, by Concentration of Sector

Sample/Measure of Profitability	Ln Point Difference in Profitability Between Highly Unionized and Less Unionized Sectors	
	Less Concentrated Industries	Highly Concentrated Industries
All Industries (IRS)		
quasi-rents/capital	.05	-.23[a]
price-cost margin	-.07	-.24[a]
Manufacturing Industries (Survey of Manufacturers)		
quasi-rents/capital	.00	-.30[a]
price-cost margin	-.01	-.19[a]

Source: Calculated from Internal Revenue Service data and Survey of Manufacturing data sets as difference between estimated coefficients on low and high union dummy variables within the sectors. Controls as in Tables 2 and 3.

a: Statistically significant at 1% level.

have fully adjusted to the economic effects of unionism, one would expect little or no connection between unionism and profitability: the effect is masked by the shrinkage of the sector. To see whether or not such a shrinkage may have occurred, I have examined the relationship of unionism and concentration to the growth of industries over the period covered. The results differ between the SOM and IRS data sets. In the SOM, the average annual compound rate of growth of value added from 1958 to 1976 was 5.1% in the low union-low concentration industries compared to 4.5% in the high union-high concentration industries, which might be taken to support the hypothesis that unionism shrinks the competitive sector. In the IRS low concentration industries, however, high union industries averaged a 3.1% increase in total receipts (1965 - 1976) compared to a 2.7% increase for low union industries. By contrast, both data sets show higher rates of growth in the high-concentrated low union sector than in the high-concentrated-high union sector (5.4 versus 4.3% in the SOM, 6.7% versus 2.8% in the IRS).[8] The variation in growth rates across industries is, however, quite great, suggesting that our findings with respect to profitability are reasonably robust with respect to differential union impacts on growth.

Other Studies

Our results on industry profitability can be compared to the analyses of Richard Caves, Michael Porter, Michael Spence, and John Scott on Canadian industries, Kim Clark on 'businesses,' Michael Salinger on companies, and R. Rubach and M. Zimmerman on the stock

prices of companies undergoing union organizing drives.

All of these studies, while based on different data and models, obtain the same basic conclusion: that unionism is associated with lower profitability. Caves et. al. finds profits to be negatively related to unionism in 85 or so Canadian industries in ordinary least squares regressions of profit-on-sales, price-cost margin and profit-on-equity on unionism and various industrial organization variables. Clark finds profits to be negatively related to unionism in regressions of price-cost margins and quasi-rents/capital for 902 individual 'businesses' in the period 1970-1980. However, contrary to our results Clark finds the union impact on profitability to be greatest in less concentrated sectors, a result due possibly to the unrepresentative sample he uses (his 'businesses' are parts of large firms who provided data for purposes of Strategic Planning). Using a different approach in which the ratio of the stock market value of a firm to the replacement value of its physical assets (Tobin's q) is taken as the measure of profitability, Professor Michael Salinger of Columbia Business School finds unionism lowers Tobin's q in a sample of 193 manufacturing firms. Supporting our finding on concentration, moreover, Salinger finds that the union effect is greatest in concentrated sectors, reducing the market value of a firm with monopoly power relative to its replacement value. Finally, in an analysis of the effect of union organizing drives on the value of a company's stock, R. Rubach and M. Zimmerman find significant negative impacts, which suggest that the stock market at least regards union organization

as harmful for profits.

Conclusion

This paper has examined available industry data on two profitability measures, the price-cost margin and the ratio of quasi-rents to capital, for the purpose of determining the effect of unionism on profits. It has found that unionism reduces profitability and that this effect occurs in highly concentrated industries. The effect of unionism is quite substantial in most calculations, suggesting that the fraction organized in a sector be included in standard Industrial Organization profitability calculations in the future.

FOOTNOTES

1. Unionism is included as a variable in one analysis of Canadian industry profitability by Caves et. al. It has been examined as a determinant of company profitability by Clark and Salinger.

2. It can be readily demonstrated that organization of a single competitive or monopolistic firm will suffer profit losses when a union forces wage increases on it.

3. See Clark.

4. The interested reader will note that two of the three measures obtain conceptually sensible signs: advertising intensity, which obtains a uniform positive coefficient in all calculations, and absolute capital requirements, positive in three of four regressions but negative in the SOM price-cost margin regression. By contrast relative minimum efficient scale does not. The strongest and most striking I-O variable in these calculations is the advertising intensity measure, supporting the Comonor-Wilson analysis of that variable's impact on profitability.

5. With payroll fixed, the return depends on the markup of price over unit cost and the capital to sales ratio, which is held fixed in the usual price-cost margin regression.

6. It is possible but unlikely that unions could organize a fraction of new entrants, maintain a constant share of industry output, and have a negative effect on profits. To do this requires considerable organizing activity, and is likely to result in weak unionism.

7. In the IRS data set log total assets of companies average 15.50 whereas log depreciable assets averages 14.15, producing a difference of -1.35 so that net depreciable assets are just 26% of total assets. The actual regression coefficients and standard errors are:

	Quasi-Rents/Capital	
All industries:	low union	high union
low concentration	-	.05 (.03)
high concentration	.20 (.03)	-.03 (.02)
Manufacturing Industries		
low concentration	-	.00 (.04)
high concentration	.02 (.03)	-.28 (.03)
	Price-Cost Margin	
All industries:		
low concentration	-	-.07 (.03)
high concentration	.23 (.03)	-.01 (.03)
Manufacturing Industries		
low concentration	-	-.01 (.01)
high concentration	.17 (.01)	-.02 (.01)

8. Calculated for 68 industries in IRS data and for 124 in SOM data.

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DATA APPENDIX

Internal Revenue Service 1965 - 1976; industries

Variables:	Definition and Source:
Adv/sales	Advertising purchased by business receiptsμ [IRS Corporate Source Book; PICA data base: HBS].
Adjusted number at markets	An average (weighted by the value of shipments comprising the IRS industries) of the number of markets in the Continental United States according to Weiss' cutoff points. The adjusted number of markets equals one if the Weiss' number is four or less. [Weiss, "The Geographic Size of Markets in Manufacturing," Review of Economics and Statistics 1972, PICA: HBS].
C4 Shepherd	A four firm concentration ratio derived from the average (weighted by the shipments of 4 digit industries comprising the IRS industries) of Shepherd's adjusted 4 digit 1966 concentration ratios for geographic dispersion and product market definition. [Shepherd, Market Power and Economic Welfare].
C4 1972	A four firm concentration ratio derived from the weighted average at 4 digit, 1972, Census of Manufacturers C4 concentration ratios for value of shipments. [1972 Census of Manufacturers; PICA: HBS].
Union	Percent of all workers covered by collective bargaining agreements obtained from a weighted average of the Freeman/Medoff estimates.
Minimum Efficient Scale (MES)	A weighted average of the ratio of the shipments of plants in employment size class containing median shipments divided by the number at plants in this class. [1972 Census of Manufacturers; PICA: HBS].

Relative MES	A weighted average of the ratio at MES divided by total industry shipments. Total Industry Shipments equals the sum of shipments in all employment size classes with ten or more employees. [1972 Census of Manufacturers; PICA: HBS].
Adjusted Rel MES	The product of relative MES times adjusted number of markets.
Union*Conc	The product of union times C4 Shepherd or C4 1972.
Capital, Depreciable	The difference of depreciable assets minus accumulated depreciation in constant 1972 dollars. [IRS Corporate Source Book; PICA: HBS].
Capital, Total Assets	Total Assets which includes both current and fixed assets in constant 1972 dollars. [IRS Corporate Source Book; PICA: HBS].
Quasi-Rents	Total Revenue — total deductions plus interest paid plus depreciation in constant 1972 dollars. [IRS Corporate Source Book; PICA: HBS].
Capital*Conc	The product of the Shepherd's or Census' concentration measure times the log of capital.
Capital*Union*Conc	The product of Union*Conc times the log of capital.
Capital Requirements	The product of Relative MES times the log of capital.
Capital*Union	The product of Union times the log of capital.
Capital*Adv/Sales	The product of advertising/sales times the log of capital.
Capital/Sales	Capital divided by business receipts.
Price/Cost Margin	Quasi-Rents divided by business receipts.
Quasi-Rents/Capital	Quasi-Rents divided by Capital.

Survey of Manufacturers 1958-1976; industries

Adv/VS	A weighted average of the Advertising/Value of shipments ratio obtained from the BEA input/output tables.
Advertising Expenditure	The product of value of shipments times Adv/VS.
Adv/VA	Advertising divided by value added.
Adjusted number of markets	See (Adjusted Number of Markets: IRS) weighted by value of shipments of 4 digit industries comprising 3 digit industries.
C4 Shepherd	Same as IRS definition.
C4 1972	Same as IRS definition.
Union	Same as IRS definition.
Minimum Efficient Scale	Same as IRS definition.
Relative MES	Same as IRS definition.
Adjusted Rel MES	Same as IRS definition.
Union*Conc	Same as IRS definition.
Capital	The net stock of capital measure is derived by a perpetual inventory method that accumulates net deflated investment flows at plant and equipment. Net stock of plant and equipment represents the value of capital assets in constant 1972 dollars adjusted for both discards of worn out assets and loss of efficiency in production. [Bureau of Labor Statistics, Capital Stocks tape; PICA: HBS].
Labor Costs	Payroll plus supplemental labor cost for the years 1972-1976. Before 1972, labor costs equals payroll times the ratio of Labor cost to payroll in 1972. In constant 1972 dollars. [Survey of Manufacturers, PICA: HBS].

Quasi-Rents	Value Added -- Labor Cost -- advertising expenditures in constant 1972 dollars.
Capital*Conc	Same as IRS.
Capital*Union*Conc	Same as IRS.
Capital Requirements	Same as IRS.
Capital and Union	Same as IRS.
Capital*Adv/VA	The product of Adv/VA times the log of capital.
Capital*Adv/VS	The product of Adv/VS times the log of capital.
Price/Cost Margin	Quasi-Rents divided by value added.
Quasi-Rents/Capital	Quasi-Rents divided by capital.
Implicit Price Deflator	The GNP price deflator for years 1958-1976. [Economic Report of the President, 1980].

Note: The IRS corporate source book provides concordances among 1963, 1968, 1973 IRS Industry classifications and between 1972 Census of Manufacturers 3 digit and 1973 IRS classifications. An Appendix of 1972 Census of Manufacturers provides a concordance between 1967 and 1972 4 digit industry classification.