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**THE EFFECTS OF PROFIT SHARING AND EMPLOYEE
STOCK OWNERSHIP PLANS:**

THE CASE OF TAIWAN'S HIGH-TECH FIRMS

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**The Effects of Profit Sharing and Employee Stock Ownership Plans: the Case of
Taiwan's High-tech Firms**

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Abstract

Since the early 1980s, Taiwan's high-tech industries have gained substantial growth, in particular in the information technology (IT) industry. It is often claimed that one of the major reasons for this success is due to the unique employee financial participation scheme adopted by many Taiwanese high-tech firms during the period of high growth, namely Taiwan-style profit sharing and employee stock ownership plans (ESOPs). Taiwan-style profit sharing and ESOPs can be viewed as a combination plan of profit sharing and employee ownership because companies adopting these plans, in general, share profits with employees in stock form. Several unique features possessed by Taiwan-style profit sharing and ESOPs tend to have some economic impacts that attract attention from economists interested in this subject of study. First and foremost, Some Taiwan-style profit sharing and ESOPs serve as very strong incentive schemes that might help improve firm performance. For instance, Lien-Fa Technology Co., a major IC designer in Taiwan, distributed approximately US\$514,285 on average to each employee in 2001. So far, this has reached the historical peak in TPSEOP record. Although less than the amount Lien-Fa shared with its employees, many Taiwan-style profit sharing and ESOPs indeed lead to motivational effects in attraction, retention and performance. Secondly, Taiwan-style profit sharing and ESOPs are flexible and adjustable according to a firm's profitability, which may help stabilize the firm's employment. Finally, most of Taiwan-style profit sharing and ESOPs grant employees stock bonuses without any charges on the part of employees. Also, employees are entitled to sell their stock bonuses in the market to reap the monetary gains immediately after receiving the bonuses. Besides annual fixed wages, these add-on components increase the amount of employees' total compensation.

Though there are many anecdotes on the economic effects of Taiwan-style profit sharing and ESOPs, there is always a lack of rigorous systematic studies examining their effects. The aim of this paper is to fill up this research gap. Specifically, this paper will illustrate the nature of Taiwan-style profit sharing and ESOPs in depth and investigate the their effects on productivity, profitability, employment stability and wage growth. Drawing on productivity theory, stability theory and efficiency wage theory, this paper will develop major theoretical arguments for Taiwan-style profit sharing and ESOPs. The data source comes from Taiwan Economic Journal (TEJ), which provides rich information on company profile, financial data, employment, wages, as well as profit sharing and employee ownership statistics of all Taiwan's publicly-traded companies across time. We will focus primarily on high-tech sectors, consisting of 115 high-tech firms. The data set is a panel data set in design, which will help us to control for endogeneity problems and fixed effects.

Key Words: employee financial participation, profit sharing, employee stock ownership plans, economic effects, high-tech firms, Taiwan

Introduction

Profit sharing and employee ownership stock plans (ESOPs) have become a worldwide phenomenon. From rather modest beginnings in the USA, employee ownership through the holding of stocks in unequal numbers, often without the right to vote them or to trade them, Profit sharing and ESOPs have spread throughout the world.

The present paper represents a comprehensive theoretical and empirical attempt to examine the effects of profit sharing and ESOPs on outcomes in firms. First, this paper discusses briefly the institutional background of Taiwan-style profit sharing and ESOPs. Second, this paper articulates a theoretical perspective that links different dimensions of profit sharing and ESOPs to various outcomes they have for firms, workers, and shareholders. Third, this paper studies empirically an original data set consisting of 115 firms in Taiwan's IT industry. Fourth, this paper investigates the effects of Taiwan-style profit sharing and ESOPs on productivity, profitability, employment and wages, using alternative measures of profit sharing and ESOPs. Finally, the conclusions will be made

Taiwan-style Profit Sharing and Employee Stock Ownership plans: An Institutional Background

Profit Sharing (fenhong)

In Taiwan, Profit Sharing (or *fenhong*) schemes are regulated under three Taiwanese laws. Under Provision 40 of the Factory Law, manufacturing plants should reward employees with bonuses or profits if the plants are profitable and employees meet requirements set by employers at the end of each fiscal year. The Factory Law was first established in mainland China by the Nationalist Government in 1930. When Japan surrendered in 1945, Nationalist Government assumed control in Taiwan after a fifty-year period of colonial rule by the Japanese military government; and at this time the Factory Law was first extended to Taiwan.

The Factory Law was succeeded by the Fair Labor Standards Act, which came into effect on July 30, 1984. Like the Factory Law, Provision 29 of the Fair Labor Standards Act stipulates that besides income tax payments, compensation for financial losses, and employers' contributions to public funds, employers should reward qualified employees with bonuses or profits at the end of each year. However, this provision does not stipulate the extent of profit employers should share with employees. Rather than improve labor relations, this ambiguity has often led to labor disputes over the shares employees should receive at the end of each year.

In addition, Provision 235 of the Corporate Law stipulates that corporate bylaws should promulgate the extent of employees' profit sharing. These laws have provided the legal rules for Taiwanese enterprises adopting profit sharing plans.

In practice, companies adopting profit sharing plans typically share profits with their employees annually after fiscal budgeting, auditing of accounts, and board meetings. The profit sharing bonus that each employee receives is usually based on his or her salary level, seniority, position (or job type), and individual performance rating. In large part because there are no tax advantages for companies to adopt profit sharing schemes, only a minority of firms in Taiwan practice profit sharing; this stands in sharp contrast to the tax advantages available for traditional bonus pay arrangements.

Data on the incidence of the profit-sharing programs are available for the period 1989 to 2000. As seen in Table 2, Column 1, the average incidence of this program shows no clear trend over the period; there were 546 plans in 1989, and 545 in 2000. However, despite the absence of a trend, there have been considerable fluctuations in the incidence of these plans, which rose to 678 in 1994, dropped precipitously to just 501 in 1995, and then slowly recovered to its pre-1990 levels. The 1995 drop has never been satisfactorily explained and is a valuable topic for future research.

ESOPs.

ESOPs feature elements of both profit sharing and employee ownership. The legal framework for ESOPs is based on Provision 240 of the Company Law stipulating that, when the company transfers net profits to be the capital investment, according to company bylaws, the firm can give employees newly issued stock or cash as their shares of these profits. In the past two decades, ESOPs were popular in some high-tech industries, in particular the semiconductor industry.

Since the mid-1980s, employee financial participation taking the form of the combined programs has gained some popularity in Taiwan's economy. Not only have many high-tech firms adopted these programs, but some enterprises in traditional industries have also followed their lead or considered the implementation of this participation scheme in the near future. This recently growing phenomenon can be viewed as a new milestone in the developments of employee financial participation in Taiwan in terms of motivational effects. Some high-tech companies shared a significant fraction of profits in stock form with their employees in recent years, which was rarely observed in the earlier experiments in employee financial sharing in Taiwan. UMC, a Taiwan-based semi-conductor firm located in Sin-Chu Science Park, was among the first to launch the combination plan in 1983. Except for omitting sharing in 1985, and again in 1991 due to the financial losses incurred in 1990, UMC has paid out under the combination plan every year since its founding. To stockholders, the percentage of stock sharing relative to revenues ranges from 15% to 93% (Tsao, 1999: 22). Since UMC first initiated the combination plan in 1983, companies in Taiwan's information and other related high-tech industries, as well as some companies in financial and other sectors have followed these trends and implemented their own ESOPs. The amount of employee stock ownership among firms in Taiwan increased substantially from 1998 to 2000. A ranking of publicly-traded companies in Taiwan by the scale of their combination plan contributions over the 1998-2000 period, were generated utilizing a comprehensive data base similar to the COMPUSTAT data set in the U.S, and are available from the authors upon request as an appendix. The results show that the top ranking firm in 2000 gave its employees stock bonuses worth NT\$ 6,116,595 per person in that year, while the top ranking firm in 1998 only shared NT\$2,977,088 per employee in stock. The data reveal that a majority of ESOP companies sharing large stock bonuses are usually profitable firms in high-tech industries. Some firms allow their employees to sell their stock as bonuses immediately upon receiving.

ESOPs have, to certain extent, generated several advantages both from employers' and employees' perspectives. It is reported that they have been an effective mechanism for attracting and retaining employees (*Tien-Hsia Magazine*, 1997; *Today Weekly*, 1998). Many foreign multinational corporations in Taiwan (e.g., IBM, HP, Philips, Texas Instruments, etc.), previously viewed by job applicants as best firms to work for, are now confronted with "fierce warfare" with local high-tech firms for the talented. And many foreign companies also lost some of their most valued employees when some local high-tech firms recruited them with highly valued stock bonuses. In some companies, profit sharing and employee stock ownership represent large shares of their total payroll costs (Fong, 1998); this parallels the experience in U.S. high-tech firms (Smith, 1988).

Despite the advantages ESOPs possess, the plans have also brought out several problems. First and foremost, ESOPs dilute the interests of outside stockholders to a great extent. And this dilution of interests has led to severe criticisms among outside stockholders as well as some academics.

Secondly, some plans adopted by Taiwan's semiconductor firms manufacturing SRAM chips were sued by American SRAM firms for "dumping" practices in 1998. Owing to differences in accounting systems between Taiwan and the U.S., stock bonuses in Taiwan are not counted as payroll cost. In the American system, these bonuses should be counted as payroll cost. Thus, American SRAM firms claimed that Taiwan's counterparts "dumped" their products in the U.S. market because the selling prices were lower than unit production costs. This dramatic development suggests potentially far-reaching implications of globalization for national practices of employee financial participation, perhaps eventually bringing some of these practices, at the very least their tax treatments, under the umbrella of trade agreements.

Thirdly, ESOPs operate effectively in profitable firms, but not in less profitable ones, showing their limited role in stabilization and expanding workplace incentives. Moreover, as the plans reward employees for previous performance, but not for future performance, this also reduces their long-term incentive effects.

Theory

Performance Effects: Productivity and Profitability

Employment Effects

Wage Effects

Methodology

Data

The data set used in the study comprises 11 years (1989-1999) of very rich firm-specific accounting, profit sharing, employee stock ownership plans and payroll information on 115 firms in the information technology (IT) industry, whose stock is publicly traded in Taiwan's stock markets. These data were collected from the data set assembled by the Taiwan Economic Journal (TEJ), an private agency in charge of financial data collection of all publicly-traded companies in Taiwan. This data set is equivalent to that of COMPUSTAT data set in the United States. By focusing on single industry, we are able to control for heterogeneity problems in many studies, which have not controlled for such problems effectively. Further, our panel data allow us to control for fixed effects and endogeneity problems that might lead to estimating biases when examining the economic effects of profit sharing and ESOPs. To attenuate such biases, we include firm-specific fixed effects by using large-scale dummy variables (LSDV) method and lagged variables of endogenous variables (i.e., fixed capital, number of employees, profit sharing and employee stock ownership plans) as explanatory variables.

Table 1 illustrates the definitions of variables used in the study and the corresponding mean values and standard deviations associated with these variables.

Table 1: Variable Definitions and Descriptive Statistics

	<i>Description</i>
Dependent Variable	
Log (Sales) _{it}	Natural logarithm of sales revenue in firm <i>i</i> at year <i>t</i>
ROA _{it}	Returns on assets in firm <i>i</i> at year <i>t</i>
R _{it}	After-tax returns on equity in firm <i>i</i> at year <i>t</i>
EPS _{it}	Earnings per share in firm <i>i</i> at year <i>t</i>
Log L _{it}	Natural logarithm of number of employees in firm <i>i</i> at year <i>t</i>
Log TOTCOM _{it}	Natural logarithm of total compensation in firm <i>i</i> at year <i>t</i>
Independent Variable	
Log K _{i,t-1}	Natural logarithm of fixed capital in firm <i>i</i> at year <i>t-1</i>
Log L _{i,t-1}	Natural logarithm of number of employees in firm <i>i</i> at year <i>t-1</i>
PS _{i,t-1} (Dummy)	Dummy for the presence of cash profit sharing in firm <i>i</i> at year <i>t-1</i> (1 = yes, 0 = no)
PS _{i,t-1} (Mean)	Natural logarithm of average cash profit sharing payment per employee in firm <i>i</i> at year <i>t-1</i>
PS _{i,t-1} (Asset Ratio)	(total cash profit sharing payment/total assets) in firm <i>i</i> at year <i>t-1</i>
PS _{i,t-1} (Salary Ratio)	(total cash profit sharing payment/total payroll) in firm <i>i</i> at year <i>t-1</i>
ESOP _{i,t-1} (Dummy)	Dummy for the presence of ESOPs in firm <i>i</i> at year <i>t-1</i> (1 = yes, 0 = no)
ESOP _{i,t-1} (Mean)	Natural logarithm of average ESOP payment per employee in firm <i>i</i> at year <i>t-1</i>
ESOP _{i,t-1} (Asset Ratio)	(total ESOP payment/total assets) in firm <i>i</i> at year <i>t-1</i>

ESOP $i,t-1$ (Salary Ratio)	(total ESOP payment/total payroll) in firm i at year $t-1$	1.4291	3.0825
Log TOTCOM it	Natural logarithm of total compensation in firm i at year t	12.0717	0.9009

Econometric Specifications

Performance Effects: Productivity and Profitability

Majority of the previous research on the performance effects of profit sharing and ESOPs has employed the Cobb-Douglas production function as the major estimating technique. For instance, Biagioli and Curatolo (1999) examine the microeconomic determinants and consequences of financial participation agreements of large Italian firms in the engineering sector. Drawing on the “productivity theory” and other theoretical arguments as well as empirical information concerning the determinants of financial participation, the authors identify several factors potentially accounting for the adoption of financial participation. The data set consists of 166 large firms in the Italian engineering sector with a data series covering the entire 1982-1991 period. Thus, the data used by them is a balanced panel data set. A probit regression is performed to estimate the effects of those factors on the adoption of the financial participation schemes. The main results show that firm size is positively associated with the adoption of financial participation schemes taking place in the late 1980s. With respect to the effects of financial participation on productivity, wage determination and three labor demand outcomes, five estimates are performed by using two-stage least squares with dummy variables (2SLSDV) method to attenuate the simultaneous problems of the model. The results show that financial participation is positively associate with total factor productivity, total wages, and short-run elasticity of labor demand. Del Boca and Cupaiuolo (1998) examine the reasons why firms in Italian small and medium-sized manufacturing firms introduce employee financial participation. The main results show that firms adopting employee financial participation have very low productivity and wage before the adoption. Also, concession bargaining is positively related to the adoption of employee financial participation. The authors conclude that the Italian experience of employee financial participation reflects the particular institutional problems of a rigid national collective bargaining, which needs compensation flexibility at the plant level to reach its productivity targets. (I think this is also one of the reasons for some firms to adopt employee financial participation in other countries including the United States, Korea and Taiwan).

Fakhfakh and Perotin (2000) investigate the effects of voluntary profit sharing on total factor productivity in small and large French firms and the importance of the technological context in which the schemes are implemented.

A Cobb-Douglas production function is estimated as below,

$$\text{Log}(\text{Sales})_{it} = A + _1 \log K_{i,t-1} + _2 \log L_{i,t-1} + _3 \text{PS}_{i,t-1} + _4 \text{ESOP}_{i,t-1} + _1 \text{FIRM}_i + _2 \text{TIME}_t + _it$$

Where,

$\text{Log}(\text{Sales})_{it}$ = natural logarithm of sales revenues at firm i in year t ,

$\log K_{i,t-1}$ = natural logarithm of fixed capital at firm i in year t ,

$\log L_{i,t-1}$ = natural logarithm of number of employees at firm i in year t ,

$\text{PS}_{i,t-1}$ = profit sharing measures at firm i in year $t-1$,

$\text{ESOP}_{i,t-1}$ = employee stock ownership plan measures at firm i in year $t-1$,

$_1$ and $_2$ = the coefficient of the production function shift associated with $\log K_{i,t-1}$ and $\log L_{i,t-1}$,

α_3 and α_4 = the coefficients for profit sharing and ESOPs,
 FIRM = a vector of firm dummies, controlling for fixed effects,
 TIME = a vector of year dummies (1989-1998, controlling for time effects).

Employment Effects

$$\ln L_{it} = \alpha_0 + \alpha_1 \ln K_{i,t-1} + \alpha_2 \ln L_{i,t-1} + \alpha_3 \text{PS}_{i,t-1} + \alpha_4 \text{ESOP}_{i,t-1} + \beta_1 \text{FIRM}_i + \beta_2 \text{TIME}_t + \epsilon_{it}$$

Wage Effects

According to the theoretical discussions, we develop the empirical log-linear specification for the wage determination equation:

$$\ln w_{it} = \beta_0 + \beta_1 \ln K_{i,t-1} + \beta_2 \ln L_{i,t-1} + \beta_3 \text{PS}_{i,t-1} + \beta_4 \text{ESOP}_{i,t-1} + \gamma_1 \text{FIRM}_i + \gamma_2 \text{TIME}_t + \epsilon_{it}$$

Where,

$\ln w_{it}$ = natural logarithm of total compensation at firm i in year t ,

$\ln K_{i,t-1}$ = natural logarithm of fixed capital at firm i in year t ,

$\ln L_{i,t-1}$ = natural logarithm of number of employees at firm i in year t ,

$\text{PS}_{i,t-1}$ = profit sharing measures at firm i in year $t-1$,

$\text{ESOP}_{i,t-1}$ = employee stock ownership plan measures at firm i in year $t-1$,

β_1 and β_2 = the coefficient of the production function shift associated with $\ln K_{i,t-1}$ and $\ln L_{i,t-1}$,

β_3 and β_4 = the coefficients for profit sharing and ESOPs,

FIRM = a vector of firm dummies, controlling for fixed effects,

TIME = a vector of year dummies (1989-1998, controlling for time effects).

Results

Performance Effects: Productivity and Profitability

Concerning the performance effects of profit sharing and ESOPs, this paper focuses on two popular performance measures in business research, namely productivity and profitability. The empirical results of the performance effects are shown from Table 2 to Table 5.

Table 2 presents the estimates of the effects of profit sharing and ESOPs on productivity measured by natural logarithm of sales revenue. Our variables for profit sharing and ESOPs consist of four different measures, accounting for the presence and degree of employee financial participation in firm's profitability. And the presence and degree of this sharing may imply the enhancing effects on motivation and productivity.

Except the variable for the total payout for cash profit sharing as percentage of total fixed payroll, the majority of explanatory variables in this table are found to be statistically positively associated with the measure of productivity. Eq. 2-1 and Eq. 2-3 illustrate that the presence of cash profit sharing and ESOPs and their shares as percentages of total assets may raise productivity by 11-13 percent. And these results seem to be consistent with prior research in this subject matter. Besides the effect of the existence of

employee financial participation, this paper includes three other variables to catch the productivity effects of the degrees of profit sharing and ESOPs. Furthermore, in Eq. 2-2 and Eq. 2-4, the results show that the average payment per employee due to cash profit sharing and ESOPs may raise productivity by 1.4-1.8 percent, while ESOP payment as the percentage of total fixed payroll may raise productivity by 1.8 percent. Tables 3-5 present the empirical results for the effects of profit sharing and ESOPs on three different profitability variables, measured by returns on asset (Table 3), after-tax economic returns (Table 4) and earnings per share (Table 5), respectively. Regarding the effects on returns on asset and after-tax economic returns, these results show a remarkable consistency with the results in Table 2. That is, except the variable of PS_{t-1} (Asset Ratio), all other variables of employee financial participation are statistically positively associated with these two profitability measures (i.e., returns on asset and after-tax economic returns). Again, in Table 5, majority of the employee financial participation variables are statistically positively associated with earnings per share, while PS_{t-1} (Asset Ratio) is negatively associated with the dependent variable at the 0.10 significance level and $ESOP_{t-1}$ (Dummy) is positively associated with the dependent variable, but insignificant.

In sum, these results seem to provide a very strong evidence for the performance effects of cash profit sharing and ESOPs in Taiwan's high-tech firms. From some anecdotal evidence regarding the practices of profit sharing and ESOPs in Taiwan's high-tech firms, more and more companies have offered very luring incentives in cash profit sharing and/or free stock bonuses to their employees, in particular managerial and R&D professionals. And these financial incentive schemes provide these firms competitive advantages in attracting highly qualified job applicants, retaining better employees and even them to put forth more efforts and wisdom, that may convert to firm performance.

Employment Effects

Table 6 presents the empirical results of the effects of profit sharing and ESOPs on employment changes. Eq. 6-1 shows that the adoption of cash profit sharing and ESOPs may increase employment growth of the future year by 4.3-6.7 percent. The results of Eq. 6-2 and Eq. 6-3 illustrate that changes in average payment per employee due to cash profit sharing and ESOPs may raise employment growth by 0.5-0.8 percent, while changes in ESOPs as the percentage of total asset may increase employment growth by 5.7 percent. None of the coefficients are negatively associated with the dependent variable measuring employment changes.

Table 7 shows the effects of profit sharing and ESOPs on employment level. Except PS_{t-1} (Asset Ratio), all other explanatory variables of the previous year are found to be statistically positively associated with the number of employees of the current year. The results in this table also coincide with that in Tables 2-4.

From the results of Tables 6-7, we may argue that firms with cash profit sharing and ESOPs can increase employment growth and level due to their performance effects which increase the demand for labor in the long run. In Taiwan, most of high-tech firms are newly established startups since the mid-1980s. During the period under study, most of them had a higher degree of growth in terms of sales revenue and the size of firm. Under such circumstances with high growth and potential, variable pay systems such as cash profit sharing and ESOPs may be the proper financial incentives consistent with the high growth strategy. In order words, by using cash profit sharing and ESOPs, firms not only boost performance but also increase employment growth and levels subsequently.

Wage Effects

Regarding the wage effects of profit sharing and ESOPs in Taiwan's high-tech firms, Table 8 illustrates that four variables of ESOPs are statistically positively related to the the natural logarithm of total

compensation. Specifically, ESOPs may raise the total compensation of employees in high-tech firms by 2.0-36 percent. However, no profit sharing measures are highly associated with the total compensation variable. In other words, employees in firms with ESOPs normally receive higher total compensation than their counterparts in non-ESOP firms. Our results seem to be consistent with the reality in Taiwan's high-tech industries. Since Taiwan-style ESOPs were invented by UMC-one of the major semiconductor manufacturer-in the mid-1980s, many high-tech firms have emulated the practices employed by UMC and even offered better incentives to their employees. The primary objectives of Taiwan-style are to attract better applicants and to retain them longer for their talents. Many job seekers with qualified credentials and competencies view ESOPs as the major inducements for them to join and remain with the firm because such financial incentives will offer them quite huge financial returns. ESOPs also create brain drain problems for non-ESOP firms in Taiwan, including many Western Multinationals which were previously viewed by Taiwanese workers as the desirable places to work for their lead policies in compensation. Now, the situations are reverse.

Conclusions

Profit sharing and employee ownership stock plans (ESOPs) have become a worldwide phenomenon. From rather modest beginnings in the USA, employee ownership through the holding of stocks in unequal numbers, often without the right to vote them or to trade them, Profit sharing and ESOPs have spread throughout the world. Since the early 1980s, Taiwan's high-tech industries have gained substantial growth, in particular in the information technology (IT) industry. It is often claimed that one of the major reasons for this success is due to the unique employee financial participation scheme adopted by many Taiwanese high-tech firms during the period of high growth profit sharing and employee stock ownership plans (ESOPs). Taiwan-style profit sharing and ESOPs can be viewed as a combination plan of profit sharing and employee ownership because companies adopting these plans, in general, share profits with employees in stock form. This paper has investigated the effects of Taiwan-style profit sharing and ESOPs on productivity, profitability, employment and wage growth. Drawing on data from Taiwan Economic Journal (TEJ), which provides rich information on company profile, financial data, employment, wages, as well as profit sharing and employee ownership statistics of all Taiwan's publicly-traded companies across time. We use a sub-sample of the data set, consisting of 115 high-tech firms. The data set is a panel data set in design, which helps us to control for endogeneity problems and fixed effects.

Our research results show that Taiwan-style profit sharing and ESOPs, to a greater extent, lead to higher firm performance in terms of productivity and profitability increases than non-sharing firms. Furthermore, these employee financial participation schemes also increase employment growth, level and total compensation. Our results seem to reflect the reality in Taiwan's high-tech sector. In particular, under circumstances characterized with high growth and demand, profit sharing in general and ESOPs in particular are often used as the important strategic compensation for attracting and retaining talented employees in the firm, which in turns convert to firm performance and growth in employment and higher total compensation.

Table 2: Productivity Effects of Profit Sharing and ESOPs
Dependent Variable: log (Sales)
?Panel Data, 1989-1999?

<i>Variable</i>	<i>Dummy</i>	<i>Mean</i>	<i>Asset ratio</i>	<i>Salary Ratio</i>
	<i>Eq. 2-1</i>	<i>Eq. 2-2</i>	<i>Eq. 2-3</i>	<i>Eq. 2-4</i>
Constant	15.808*** (0.474)	16.255*** (0.54)	15.587*** (0.476)	16.106*** (0.499)
Log Kt-1	0.118*** (0.029)	0.101*** (0.033)	0.124*** (0.029)	0.100*** (0.03)
Log Lt-1	0.48*** (0.040)	0.46*** (0.043)	0.495*** (0.04)	0.489*** (0.04)
PSt-1?Dummy?	0.113*** (0.027)			
PSt-1?Mean?		0.014*** (0.004)		
PSt-1 (Asset Ratio)			0.112** (0.046)	
PSt-1 (Salary Ratio)				0.003 (0.004)
ESOPt-1?Dummy?	0.132*** (0.028)			
ESOPt-1?Mean?		0.018*** (0.003)		
ESOPt-1 (Asset Ratio)			0.135*** (0.031)	
ESOPt-1 (Salary Ratio)				0.018*** (0.005)
Year Dummies	YES	YES	YES	YES
Fixed Effects	YES	YES	YES	YES
Number of observations	986	841	986	968
Number of firms	115	115	115	115
Number of years	11	11	11	11
F-test R2 Adj-R2	129.330*** 0.95 0.943	107.59*** 0.95 0.942	127.089*** 0.95 0.942	126.351*** 0.95 0.943

Notes: * for $p \leq 0.10$, ** for $p \leq 0.05$, and *** for $p \leq 0.01$.
Standard errors are reported in parentheses.

Table 3: Profitability Effects of Profit Sharing and ESOPs
Dependent Variable: ROA
?Panel Data, 1989-1999?

<i>Variable</i>	<i>Dummy</i>	<i>Mean</i>	<i>Asset ratio</i>	<i>Salary Ratio</i>
	<i>Eq. 3-1</i>	<i>Eq. 3-2</i>	<i>Eq. 3-3</i>	<i>Eq. 3-4</i>
Constant	57.578*** (10.431)	56.756*** (11.58)	52.674*** (10.479)	60.338*** (11.382)
Log Kt-1	-2.356*** (0.637)	-2.208*** (0.705)	-2.230*** (0.643)	-2.706*** (0.683)
Log Lt-1	-0.550 (0.871)	-0.806 (0.926)	-0.123 (0.874)	0.187 (0.922)
PSt-1 (Dummy)	2.48*** (0.587)			
PSt-1 (Mean)		0.323*** (0.076)		
PSt-1 (Asset Ratio)			3.795*** (1.022)	
PSt-1 (Salary Ratio)				0.124 (0.100)
ESOPt-1 (Dummy)	4.23*** (0.610)			
ESOPt-1 (Mean)		0.283*** (0.066)		
ESOPt-1 (Asset Ratio)			4.073*** (0.688)	
ESOPt-1 (Salary Ratio)				0.283** (0.116)
Year Dummies	YES	YES	YES	YES
Fixed Effects	YES	YES	YES	YES
Number of observations	987	842	987	969
Number of firms	115	115	115	115
Number of years	11	11	11	11
F-test R2 Adj-R2	6.832*** 0.503 0.429	5.626*** 0.500 0.411	6.609*** 0.494 0.419	5.886*** 0.471 0.391

Notes: * for $p \leq 0.10$, ** for $p \leq 0.05$, and *** for $p \leq 0.01$.
Standard errors are reported in parentheses.

Table 4: Profitability Effects of Profit Sharing and ESOPs
Dependent Variable: R
?Panel Data, 1989-1999?

<i>Variable</i>	<i>Dummy</i>	<i>Mean</i>	<i>Asset ratio</i>	<i>Salary Ratio</i>
	<i>Eq. 4-1</i>	<i>Eq. 4-2</i>	<i>Eq. 4-3</i>	<i>Eq. 4-4</i>
Constant	151.504*** (22.065)	144.404*** (24.812)	140.976*** (22.252)	153.971*** (23.936)
Log Kt-1	-5.993*** (1.350)	-5.362*** (1.512)	-5.734*** (1.367)	-6.583*** (1.440)
Log Lt-1	-2.472 (1.847)	-3.219 (1.990)	-1.562 (1.859)	-0.924 (1.943)
PSt-1 (Dummy)	5.075*** (1.240)			
PSt-1 (Mean)		0.606*** (0.162)		
PSt-1 (Asset Ratio)			5.804*** (2.166)	
PSt-1 (Salary Ratio)				0.056 (0.210)
ESOPt-1 (Dummy)	7.776*** (1.289)			
ESOPt-1 (Mean)		0.487*** (0.142)		
ESOPt-1 (Asset Ratio)			6.985*** (1.460)	
ESOPt-1 (Salary Ratio)				0.532** (0.244)
Year Dummies	YES	YES	YES	YES
Fixed Effects	YES	YES	YES	YES
Number of observations	986	841	986	968
Number of firms	115	115	115	115
Number of years	11	11	11	11
F-test R2 Adj-R2	5.661*** 0.456 0.375	4.727*** 0.457 0.360	5.369*** 0.443 0.360	4.935*** 0.427 0.341

Notes: * for $p \leq 0.10$, ** for $p \leq 0.05$, and *** for $p \leq 0.01$.
Standard errors are reported in parentheses.

Table 5: Profitability Effects of Profit Sharing and ESOPs
Dependent Variable: EPS
?Panel Data, 1989-1999?

Variable	Dummy	Mean	Asset ratio	Salary Ratio
	<i>Eq. 5-1</i>	<i>Eq. 5-2</i>	<i>Eq. 5-3</i>	<i>Eq. 5-4</i>
Constant	24.228*** (4.095)	21.362*** (4.436)	22.861*** (4.090)	22.651*** (4.401)
Log Kt-1	-0.929*** (0.250)	-0.776*** (0.270)	-0.897*** (0.251)	-0.945*** (0.264)
Log Lt-1	-0.311 (0.342)	-0.316 (0.355)	-0.184 (0.341)	-0.007 (0.356)
PSt-1 (Dummy)	0.853*** (0.231)			
PSt-1 (Mean)		0.103*** (0.029)		
PSt-1 (Asset Ratio)			1.521*** (0.399)	
PSt-1 (Salary Ratio)				-0.065* (0.039)
ESOPt-1 (Dummy)	1.190 (0.240)			
ESOPt-1 (Mean)		0.065** (0.025)		
ESOPt-1 (Asset Ratio)			1.153*** (0.269)	
ESOPt-1 (Salary Ratio)				0.080* (0.045)
Year Dummies	YES	YES	YES	YES
Fixed Effects	YES	YES	YES	YES
Number of observations	987	842	987	969
Number of firms	115	115	115	115
Number of years	11	11	11	11
F-test R2 Adj-R2	7.167*** 0.514 0.443	5.083*** 0.475 0.381	7.103*** 0.512 0.440	6.570*** 0.498 0.422

Notes: * for $p \leq 0.10$, ** for $p \leq 0.05$, and *** for $p \leq 0.01$.
Standard errors are reported in parentheses.

Table 6: Employment Effects of Profit Sharing and ESOPs
Dependent Variable: $\Delta \log L$
?Panel Data, 1989-1999?

<i>Variable</i>	<i>Dummy</i>	<i>Mean</i>	<i>Asset ratio</i>	<i>Salary Ratio</i>
	<i>Eq. 6-1</i>	<i>Eq. 6-2</i>	<i>Eq. 6-3</i>	<i>Eq. 6-4</i>
Constant	0.047*** (0.011)	0.045*** (0.0.011)	0.045*** (0.011)	0.047*** (0.011)
$\Delta \log K_{t-1}$	0.179*** (0.033)	0.153*** (0.035)	0.189*** (0.034)	0.178*** (0.034)
$\Delta \log L_{t-1}$	0.044 (0.045)	0.022 (0.047)	0.049 (0.045)	0.051 (0.046)
$\Delta \log \text{TOTCOM}$	-0.071*** (0.019)	-0.080*** (0.020)	-0.072*** (0.019)	-0.075*** (0.020)
$\Delta \text{PSt-1}$ (Dummy)	0.043** (0.021)			
$\Delta \text{PSt-1}$ (Mean)		0.005* (0.003)		
$\Delta \text{PSt-1}$ (Asset Ratio)			0.044 (0.036)	
$\Delta \text{PSt-1}$ (Salary Ratio)				0.006 (0.005)
$\Delta \text{ESOPt-1}$ (Dummy)	0.067*** (0.025)			
$\Delta \text{ESOPt-1}$ (Mean)		0.008*** (0.002)		
$\Delta \text{ESOPt-1}$ (Asset Ratio)			0.057* (0.031)	
$\Delta \text{ESOPt-1}$ (Salary Ratio)				0.001 (0.004)
Number of observations	832	760	832	820
Number of firms	115	115	115	115
Number of years	11	11	11	11
F-test R2 Adj-R2	18.366*** 0.121 0.115	15.579*** 0.115 0.107	17.056*** 0.114 0.107	15.938*** 0.109 0.102

Notes: * for $p < 0.10$, ** for $p < 0.05$, and *** for $p < 0.01$.
Standard errors are reported in parentheses.

Table 7: Employment Effects of Profit Sharing and ESOPs
Dependent Variable: log L
?Panel Data, 1989-1999?

<i>Variable</i>	<i>Dummy</i>	<i>Mean</i>	<i>Asset ratio</i>	<i>Salary Ratio</i>
	<i>Eq. 7-1</i>	<i>Eq. 7-2</i>	<i>Eq. 7-3</i>	<i>Eq. 7-4</i>
Constant	0.638 (0.480)	1.167** (0.507)	0.428 (0.484)	0.751 (0.512)
Log Kt-1	0.123*** (0.025)	0.112*** (0.027)	0.134*** (0.025)	0.114*** (0.026)
Log Lt-1	0.672*** (0.034)	0.656*** (0.035)	0.683*** (0.034)	0.683*** (0.035)
Log TOTCOM	-0.083*** (0.019)	-0.104*** (0.020)	-0.089*** (0.020)	-0.083*** (0.020)
PSt-1 (Dummy)	0.081*** (0.022)			
PSt-1 (Mean)		0.011*** (0.003)		
PSt-1 (Asset Ratio)			0.105** (0.042)	
PSt-1 (Salary Ratio)				0.006 (0.005)
ESOPt-1 (Dummy)	0.129*** (0.024)			
ESOPt-1 (Mean)		0.014*** (0.002)		
ESOPt-1 (Asset Ratio)			0.117*** (0.031)	
ESOPt-1 (Salary Ratio)				0.014*** (0.004)
Year Dummies	YES	YES	YES	YES
Fixed Effects	YES	YES	YES	YES
Number of observations	832	760	832	820
Number of firms	115	115	115	115
Number of years	11	11	11	11
F-test R2 Adj-R2	121.430*** 0.957 0.949	112.706*** 0.957 0.949	117.865*** 0.955 0.947	114.717*** 0.955 0.947

Notes: * for $p \leq 0.10$, ** for $p \leq 0.05$, and *** for $p \leq 0.01$.
Standard errors are reported in parentheses.

Table 8: Wage Effects of Profit Sharing and ESOPs
Dependent Variable: log (Total Compensation: TOTCOM)
?Panel Data, 1989-1999?

<i>Variable</i>	<i>Dummy</i>	<i>Mean</i>	<i>Asset ratio</i>	<i>Salary Ratio</i>
	<i>Eq. 8-1</i>	<i>Eq. 8-2</i>	<i>Eq. 8-3</i>	<i>Eq. 8-4</i>
Constant	12.860*** (0.808)	12.751*** (0.856)	12.629*** (0.786)	13.735*** (0.816)
Log Kt-1	0.022 (0.049)	0.040 (0.052)	0.040 (0.048)	-0.025 (0.050)
Log Lt-1	-0.286*** (0.066)	-0.336*** (0.068)	-0.304*** (0.064)	-0.273*** (0.066)
PSt-1?Dummy?	0.007 (0.043)			
PSt-1?Mean?		-0.001 (0.005)		
PSt-1 (Asset Ratio)			0.089 (0.079)	
PSt-1 (Salary Ratio)				0.010 (0.009)
ESOPt-1?Dummy?	0.164*** (0.046)			
ESOPt-1?Mean?		0.020*** (0.005)		
ESOPt-1 (Asset Ratio)			0.364*** (0.058)	
ESOPt-1 (Salary Ratio)				0.042*** (0.008)
Year Dummies	YES	YES	YES	YES
Fixed Effects	YES	YES	YES	YES
Number of observations	832	760	832	820
Number of firms	115	115	115	115
Number of years	11	11	11	11
F-test R2 Adj-R2	20.862*** 0.790 0.752	20.053*** 0.798 0.758	21.973*** 0.799 0.762	21.143*** 0.795 0.757

Notes: * for $p < 0.10$, ** for $p < 0.05$, and *** for $p < 0.01$.
Standard errors are reported in parentheses.

References

Alchian, Armen and Harold Demsetz (1972), "Production, information costs, and economic organization," *American Economic Review* 62, December, 777-95

Ben-Ner, Avner and Derek C. Jones (1995), "Employee Participation, Ownership and Productivity: A Theoretical Framework," *Industrial Relations*, 34(4), pp. 532-554.

_____, Fanmin Kong, Tzu-Shian Han, Nien-Chi Liu, and Yong-Seung Park (forthcoming), "The Organization of Work: Changes and Their Consequences," *Nordic Journal of Political Economy*.

_____, Tzu-Shian Han and Derek Jones (1996), "The Productivity Effects of Employee Participation in Control and in Economic Returns: A Review of Econometric Studies," in Ugo Pagano and Robert E. Rowthorn (eds.), *Democracy and Efficiency in Economic Enterprises*, Routledge, pp. 209-244.

_____, Avner, Fanmin Kong and Stacie Boseley (1998), "Workplace Organization and Human Resource Practices: The Retail Food Industry," paper presented the Wharton School conference on the Organization of Work in Service Industries, October.

Biagioli, Mario and Curatolo, Aslvatore. (1999), "Microeconomic Determinants and Effects of Financial Participation Agreements: An Empirical Analysis of the Large Firms of the Engineering Sector in the Eighties and Early Nineties," *Economic Analysis: Journal of Enterprise and Participation*, 2(2), pp. 99-130.

Blair, Margaret M. (1995), *Ownership and Control: Rethinking Corporate Governance for the Twenty-First Century*. Washington, D.C.: The Brookings Institution.

Del Boca, Alessandra and Cupaiuolo, Elisabetta (1998), "Why Do Firms Introduce Financial Participation? Evidence from a Sample of Small and Medium Italian Manufacturing Companies," *Economic Analysis: Journal of Enterprise and Participation*, 1(3), pp. 221-237.

Estrin, Saul, Derek C. Jones and Jan Svejnar (1987), "The Productivity Effects of Worker Participation: Producer Cooperatives in Western Europe," *Journal of Comparative Economics*, 11(1), pp. 40-61.

Fakhfakh, Fathi and Perotin, Virginie (2000), "The Effects of Profit-sharing Schemes on Enterprise Performance in France," *Economic Analysis*, 3(2), pp.93-111

FitzRoy, F. and K. Kraft (1986), "Profitability and Profit Sharing," *Journal of Industrial Economics*, 35, pp. 113-130.

Fong, Der-Lin. (1998), "Profit sharing in Taiwan's electronic companies," *Fortune Information*, May,

1998, pp. 242-249 (in Chinese).

Jensen, Michael and William Meckling (1979), "Rights and Production Functions: An Application to Labor-Managed Firms and Codetermination," *Journal of Business*, 52, pp. 469-506.

Jones, Derek C. and Takao Kato (1995), "The Productivity Effects of Employee Stock-Ownership Plans and Bonuses: Evidence from Japanese Panel Data," *The American Economic Review*, 85(3), pp. 391-414.

Kandel, Eugene and Edward P. Lazear, (1992), "Peer Pressure and Partnership," *Journal of Political Economy*, 100, pp. 801-817.

Kruse, Douglas L. (1993), *Profit Sharing: Does It Make A Difference?* Kalamazoo, Michigan: W. E. Upjohn Institute for Employment Research.

_____, and Joseph R. Blasi (1997), "Employee Ownership, Employee Attitudes, and Firm Performance: A Review of the Evidence," in David Lewin, Daniel J. B. Mitchell, and Mahmood A. Zaidi (eds.), *The Human Resource Handbook*, Part 1, Greenwich, Connecticut: JAI Press Inc., pp. 113-151.

Lazear, Edward (1992), "Compensation, Productivity, and the New Economics of Personnel," in David Lewin, Olivia S. Mitchell, and Peter D. Sherer (eds.), *Research Frontiers in Industrial Relations and Human Resources*, Madison, WI: Industrial Relations Research Association, pp. 341-380.

Levine, David and Laura D'Andrea Tyson (1990), "Participation, Productivity, and the Firm's Environment," in Alan Blinder (ed.), *Paying for Productivity: A Look at the Evidence*, Washington, D.C.: Brookings Institution, pp. 183-243.

Ohkusa, Yasushi and Fumio Ohtake (1997), "The Productivity Effects of Information Sharing, Profit Sharing, and ESOPs," *Journal of the Japanese and International Economics*, 11, pp. 385-402.

Putterman, Louis (1982), "On Some Recent Explanations of Why Capital Hires Labor," *Economic Inquiry*, 22, pp. 171-187.

Smith, Stephen C. (1988), "On the Incidence of Profit and Equity Sharing: Theory and an Application to the High Tech Sector," *Journal of Economic Behavior and Organization*, 9, pp. 45-58

Strauss, George (1990), "Participatory and Gain-Sharing Systems: History and Hope," in Myron J. Roomkin (ed.), *Profit Sharing and Gain Sharing*, IMLR Press, pp. 1-45.

Tien-Hsia Magazine. (1997), "New strategy for corporations to hunt for people: the talented fly with stock," October, pp. 122-133.

Today Weekly. (1998), "A survey of employee stock ownership in Taiwan's electronic companies," May 5, pp. 20-37 (in Chinese).

Tsao, Hsin-chen (1999), *On the Competitiveness of Taiwan's IC Industry*, Taipei, Taiwan: The UMC Group.

Wadhvani, Sushil and Martin Wall. (1990), "The Effect of Profit Sharing on Employment, Wages, Stock Returns and Productivity." *The Economic Journal*, 100, pp.1-17.

_____, and Douglas Kruse (1990), "Profit Sharing and Productivity," in Alan Blinder (Ed.), *Paying for Productivity: A Look at the Evidence*, Washington, D.C.: Brookings Institution, pp. 95-140.

Yellen, Janet (1984), "Efficiency Wage Models of Unemployment," *The American Economic Review*, 74,

pp. 200-205.