

Capital Growth, Financing Source and Profitability of Small Businesses: Evidence from Taiwan Small Enterprises

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ABSTRACT. This paper examines the relationship between profitability and financial capital for 1,276 small firms in Taiwan over the period 1992–1997. The results indicate a statistically positive relationship between profitability and capital growth. When financial capital is further divided into debt and equity, the results indicate a significantly positive relationship between profitability and equity financing, but a significantly negative relationship between profitability and debt financing. Moreover, the profitability of small firms is positively related to both the external economic conditions and the firms' previous profitability.

1. Introduction

This paper examines the relationship between profitability and capital growth for small firms in Taiwan. Specifically, we investigate if there exists a positive relationship between profitability and capital growth. Financial capital is an important production factor that is of particular importance for small firms. One major difficulty small firms

have is the lack of financial capital. Moreover, in Taiwan, small firms usually are unable to issue securities in financial markets. This constraint on financial capital might have a significant impact on the profitability of small firms. An understanding of the relationship between profitability and capital growth will enhance our knowledge concerning the determinants of the success and failure for small firms.

Two major forms of financial capital are debt and equity. If financial capital plays an important role in the profitability of small firms, it would be interesting to answer a further question on the relationship between profitability and different sources of financing. Specifically, we address the issue of whether there exists a positive relationship between profitability and equity financing, and whether there exists a negative relationship between profitability and debt financing for small firms.

Small firms typically find it difficult to borrow from a commercial bank due to inadequate collateral value of assets and unstable cash flows. Moreover, costs of debt financing are usually higher for small firms than for large firms due to the higher credit risk of small firms. Thus, heavy reliance on debt financing for capital needs may be negatively related to the profitability of small firms. In contrast, internal equity such as retained earnings is under the discretion of managers and is a more convenient way of financing source for small firms. Thus, if small firms are able to support capital needs through equity financing, they might be in a better position to undertake profitable investment opportunities. If so, there would exist a positive relationship between profitability and equity financing.

Despite of its importance, the issue of the

Final version accepted on May 4, 2001

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relationship between profitability and financial capital is not fully understood for small firms in Taiwan. This paper examines this issue for 1,276 small firms in Taiwan over the period 1992–1997. The results support the notion that financial capital is significantly positively related to the profitability of small firms. Moreover, profitability is significantly positively related to equity financing, and significantly negatively related to debt financing.

The plan of this paper is as follows. The next section provides a brief literature review. The third section develops the relevant hypotheses. The fourth section describes the data and the methodology. The fifth section reports empirical results. The last section concludes.

2. Literature review

Previous researchers hypothesize a positive relationship between profitability and financial capital. Geroski et al. (1997) suggest that the corporate growth rate for the current period should reflect the assessment of managers concerning the long-term profitability of the company. Using data from 271 large firms in the United Kingdom, they find a significantly positive correlation between the corporate growth rate for the current period and the changes in expectations about the firm's long-term profitability. Similarly, Echevarria (1997) examines a sample of Fortune 500 industrial companies over the twenty-year period from 1971 through 1990 and finds a positive relationship between capital investment and profitability. These results, however, are based on samples of large firms.

For small firms, the issue of undercapitalization has received much attention. Davidson and Dutia (1991) note that small firms tend to have difficulty to access the financial market. Thus, small firms are usually forced to finance firm growth through debt. The lack of capital tends to lead small firms to lower profitability. Davidson and Dutia examine financial data of small firms provided by Robert Morris and Associates over the period from 1983 through 1987 and find that the heavy usage of debt as a financing source is an important factor for the lower profitability of small firms. Similarly, Ballantine et al. (1993) examine the relationship between financial structure and the profitability

for small firms. Using data from the IRS Corporate Source Book of the Statistics of Income, they find lower profits for small firms that use higher debt. More recently, Hughes (1997) examines small firms in the United Kingdom and reaches similar conclusions that profitability for small firms is lower due to their heavy reliance on debt.

Holmes et al. (1994) investigate the costs of debt for small firms. They propose that the application costs for debt is higher for small firms than for medium and large firms. Using data from 425 small and large Australia firms, they find that the cost of debt financing is higher for small firms than that for medium and large firms. Since the application cost for debt is higher for small firms, this higher debt financing cost may deter small firms from growth. Similarly, Binks and Ennew (1996) examine the issue of financing constraint on growing firms. They survey a sample of over 6,000 firms in the United Kingdom and find that firms expecting to grow in the future do perceive a rather tight credit constraint.

Given that debt financing is costly for small firms, small firms may prefer to rely more on internal equity as a source of fund. Chittenden et al. (1996) examine 3,480 small firms in the United Kingdom and find that small firms rely more on internal funds. More recently, Jordan et al. (1998) survey small firms in the England and find that small firms tend to use retained earnings first, then resort to debt when retained earnings are used up, and finally to external equity when borrowing limits are reached. These results are consistent with the pecking order hypothesis for capital policy adopted by firms.

3. Hypotheses

Capital growth and profitability

Capital growth refers to an increase in capital a firm puts forth in investments. These investments may involve both tangible assets, such as fixed assets and current assets, and intangible assets such as brand equity. In general, a firm should invest only in an asset that generates positive net present value. That is, an investment should be accepted only if the expected rate of return exceeds the relevant opportunity cost.

Aside from financial capital, two other factors

are related to the expected rate of return on an investment, namely, the external economic conditions and a small firm's own competitive advantage. When external economic conditions are favorable, a small firm would expect a higher rate of return on a project. For many small exporting firms in Taiwan, for example, favorable economic conditions would imply more orders and better trade terms from foreign importers. Similarly, the profitability of small firms targeted at domestic markets is strongly affected by the domestic economic conditions. In contrast, under unfavorable external economic conditions, a small firm would expect less investment opportunities and lower rates of returns on these investment opportunities due to a declining market demand.

Aside from external economic conditions, a small firm's own competitive advantage may affect its expected rate of return on a project investment. Small firms differ in their abilities to compete among one another. Some small firms may have relative advantage in acquiring production technology, penetrating the market, and accessing the financial market than other small firms. These competitive small firms would expect more investment opportunities and higher rates of return on their investments than other less competitive smaller firms.

When a small firm expects a higher rate of return on an investment, it will invest more money to maximize their shareholders' wealth. In contrast, if a small firm perceives a lower rate of return on investment opportunities, it would invest less money. Alternatively, if a small firm experienced higher profitability in the past years, it would be able to retain more earnings for future investments, which again would lead to capital growth. Under these situations, we would expect a positive relationship between profitability and capital growth.

Financing source and profitability

When investing in an asset, a small firm must determine what is the appropriate source of funding. Specifically, a small firm must determine what is the appropriate combination of debt and equity in funding the project. For a small firm, the most convenient financing source is the internal equity. Internal equity involves retained earnings

a small firm has accumulated in the past years. In general, for small firms, retained earnings are the most important financing source for capital investment. When a small firm has a profitable investment opportunity, managers usually find it convenient to use retained earnings as a funding source. Alternatively, when a small firm earns profits on earlier investments, it tends to retain a significant portion of the profit for future capital needs. In general, when a small firm is more capable of providing capital funding through internal equity, it is more likely to realize profitable investment opportunities in the future. Thus, there should exist a positive relationship between the use of equity as a funding source and the profitability from an investment.

Alternatively, a small firm may use debt as a funding source by borrowing from a commercial bank or a third party. However, raising money through debt is a less convenient and more expensive way of financing. First, a small firm may find it harder to borrowing money from a commercial bank than larger firms. Due to the lower collateral value of assets and less stable cash flows of small firms, some commercial banks may be reluctant to grant a loan to a small firm. Moreover, even if a small firm can obtain a loan from a commercial bank, the loan rate may be higher. Commercial banks may require a higher risk premium when lending to small firms than to larger firms. This will lower the profitability a small firm can earn from conducting an investment.

Moreover, a commercial bank may hesitate to grant a loan to a small firm if the intended investment is considered risky even though the expected rate of return might be high. Thus, reliance on debt finance might reduce the investment opportunities available for small firms. However, if less profit is retained in the past due to lower profitability, a small firm must rely more on debt financing even though debt financing is more costly. When a small firm relies heavily on the more costly debt as a financing source, the profitability could be lower. Thus, there should exist a negative relationship between the use of debt financing as a funding source and the profitability from an investment project.

Other factors

Clearly, financial capital is only one kind of production factors that contribute to profitability for small firms. Several other factors can also affect profitability in a significant way. These factors fall into two major categories, namely, external environmental factors and corporate factors. External environmental factors involve both the changing economic conditions and the specific industry factors. For small firms in Taiwan, the impact of external economic conditions can be very important. For example, many small firms manufacture products that are exported to foreign countries. Demand on these products links directly to the world economy. Other small firms provide products and service to domestic consumers. The domestic economy affects the profitability of these firms significantly. Thus, the profitability of a small firm should be positively related to the rise and fall of the external economic conditions.

Aside from the external economic conditions, several firm-specific factors could have a significant impact on the firms' profitability. These factors may include research and development, production technology, usage of energy, quality of human capital, brand name, and so forth. Thus, some small firms may be more competitive than others even though they are within the same industry. Although data on these variables are not readily available, a more competitive small firm should experience higher profits. If a competitive small firm can maintain its advantage for some periods of time, the profitability in successive periods should be positively related.

Data and methodology

The sample contains 1,276 small firms over the period from 1992 through 1997. Sample firms are drawn from a database that contains the financial data for the largest 3,000 manufacturing firms in Taiwan. To qualify as a small firm, the par value of common stock must be less than New Taiwan Dollar (NT\$) 200 million. (Currently, US\$1 is around NT\$30–35.) Moreover, financial institutions and listed companies are excluded. Unlike small firms, these financial institutions and listed corporations can access the financial markets relatively easily. Finally, selected sample firms

must have data on relevant financial variables for at least two years

Moreover, to provide a comparison, 883 larger firms are also examined. These larger firms are obtained from the same database mentioned above. However, financial institutions and small firms are excluded for the sample of large firms. In addition, the selected large firms must also satisfy the same screening criterion of financial data for at least two years in the sample period.

The first hypothesis predicts a positive relationship between capital growth and profitability. To test this hypothesis, the following equation is estimated.

$$P_{i,t} = \alpha + \beta_1 \text{CapitalGrowth}_{i,t} + \beta_2 \text{EconGrowth}_t + \beta_3 P_{i,t-1} + \sum_{j=4}^9 \beta_j \text{IndDummy}_{i,j} + \beta_{10} \text{DebtRatio}_{i,t-1} + \beta_{11} \text{Size}_{i,t} + \varepsilon_{i,t} \quad (1)$$

where

$P_{i,t} = \text{PTI}_{i,t} / \text{NS}_{i,t}$, or the ratio of the pre-tax income, $\text{PTI}_{i,t}$, divided by the net sales, $\text{NS}_{i,t}$, for firm i in year t . This pre-tax profit ratio is a measure of profitability.

$\text{CapitalGrowth}_{i,t} = \ln[(D_{i,t} + E_{i,t}) / (D_{i,t-1} + E_{i,t-1})]$, or the logarithmic value of the ratio of total assets on the yearend t to the total assets on the yearend $t-1$. Here, the total assets are the sum of debt, D , and equity, E .

EconGrowth = the annual economic growth rate for year t .

$P_{i,t-1} = \text{PTI}_{i,t-1} / \text{NS}_{i,t-1}$, or the measure of profitability in the previous year $t-1$.

$\text{IndDummy}_{i,t} = 1$ if firm i is in industry j , and $= 0$ otherwise.

$\text{DebtRatio}_{i,t-1} = D_{i,t-1} / (D_{i,t-1} + E_{i,t-1})$, or the ratio of debt to total assets on the previous yearend $t-1$.

$\text{Size}_{i,t} = \ln(\text{number of employees})$. The number of employees for firm i in year t is intended to measure the size of the firm.

$\varepsilon_{i,t}$ = the random error for firm i in year t .

Equation (1) tests if there exists a positive relationship between profitability and capital growth. If the coefficient associated with the

independent variable, $\text{CapitalGrowth}_{i,t}$, is statistically significantly positive, the result would support the hypothesis that small firms tend to invest more money on projects when they expect higher returns on these investments. Moreover, equation (1) tests whether there is a positive relationship between profitability and external economic conditions, $\text{EconGrowth}_{i,t}$, and between profitability and a small firm's competitive strength as measured by the firm's profitability in the previous year, $P_{i,t-1}$. The potential industry effect is also examined to see if profitability is affected when a small firm is in a particular industry. Six major industries are considered, namely, the plastic, steel, food, textile, mechanic, and electronic industry. Finally, the logarithmic value of employee number, $\text{Size}_{i,t}$, and the debt ratio in the previous year, $\text{DebtRatio}_{i,t-1}$, are included to control for the potential impact of firm size and the previous year's financial structure.

The second hypothesis predicts a positive relationship between profitability and the reliance on equity as a source of financing, and a negative relationship between profitability and the reliance on debt as a source on financing. To test this hypothesis, the following equation is estimated.

$$\begin{aligned} P_{i,t} = & \alpha + \beta_1 \text{DebtGrowth}_{i,t} + \beta_2 \text{EquityGrowth}_{i,t} + \beta_3 \text{EconGrowth}_{i,t} \\ & + \beta_4 P_{i,t-1} + \sum_{j=5}^{10} \beta_j \text{IndDummy}_{i,j} + \beta_{11} \text{DebtRatio}_{i,t-1} + \beta_{12} \text{Size}_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (2)$$

where

$\text{DebtGrowth}_{i,t} = \ln(D_{i,t}/D_{i,t-1})$, or the growth rate of debt.

$\text{EquityGrowth}_{i,t} = \ln(E_{i,t}/E_{i,t-1})$, or the growth rate of equity.

Other variables are the same as those in equation (1).

If the coefficient for the independent variable, $\text{EquityGrowth}_{i,t}$, is significantly positive, and moreover, if the coefficient for the independent variable, $\text{DebtGrowth}_{i,t}$, is significantly negative, the results would support the notion that reliance on equity financing allows small firms to conduct more profitable investments. But if internal equity is inadequate, small firms may have to finance

project investments through debt. If so, this would lead to lower profitability for small firms.

Empirical results

Table I presents summary statistics for financial variables of selected small firms over the sample period 1992–1997. The average pre-tax profit accounts for 3.7% of net sales. Over the sample period, average growth rate for financial capital is 11% for small firms in the sample. When the financial capital is further divided into debt and equity, the average growth rate is 9% for debt and 13% for equity. Thus, small firms appear to rely more on equity than on debt as a source of new investment financing. The annual economic growth rate ranges from 5.67% to 6.77% with an average of 6.4% over the sample period. The average ratio of debt to total assets in the previous year is 60% for small firms. This indicates that small firms rely more on debt than on equity in previous periods. Finally, the average number of employees is 831 persons, which translates into a logarithmic value of 4.73 for the independent variable, Size .

Table II presents regression results for the relationship between profitability and capital growth. Consistent with the prediction of the hypothesis developed earlier, the results indicate a positive relationship between profitability and capital growth. The estimated coefficient for the independent variable, CapitalGrowth , is 0.035 with a t -value of 6.13. Thus, small firms appear to invest more on projects when they perceive higher rates of returns on these investment opportunities.

Table II also indicates that profitability is positively related to external economic conditions and previous profitability. The estimated coefficient is 1.26 with a t -value of 3.15 for the independent variable of economic growth rate. Similarly, the estimated coefficient is 0.59 with a t -value of 23.6 for the independent variable of previous profitability. Thus, for small firms, the profitability appears to be strongly affected by external economic environment and by previous profit records. Moreover, small firms in different industry sectors perform differently. In particular, small firms in the electronic industry outperform the market, while those in the food industry under-

TABLE I
Summary statistics of financial variables for small firms over 1992–1997

Variables	Mean value	Mode value	Maximum value	Minimum value	Standard deviation
Profitability in year t	0.037	0.04	0.95	-0.76	0.08
Capital growth rate	0.11	0	3.52	-2.26	0.29
Debt growth rate	0.09	0	4.85	-3.65	0.44
Equity growth rate	0.13	0	3.32	-3.34	0.41
Economic growth rate (%)	6.40	6.77	6.77	5.67	0.40
Profitability in year $t - 1$	0.032	0.02	0.56	-0.86	0.07
Plastic industry dummy	0.191	0	1	0	0.39
Steel industry dummy	0.192	0	1	0	0.39
Food industry dummy	0.078	0	1	0	0.27
Textile industry dummy	0.082	0	1	0	0.27
Mechanic industry dummy	0.138	0	1	0	0.34
Electronic industry dummy	0.161	0	1	0	0.37
Debt ratio in year $t - 1$	0.60	0.5	0.98	0.02	0.19
Size	4.73	4.60	6.41	1.79	0.74

Notes:

The definition of each variable is as follows:

Profitability, $P_{i,t} = \text{PTI}_{i,t} / \text{NS}_{i,t}$, where PTI = pre-tax income, NS = net sales.

CapitalGrowth $_{i,t} = \ln [(D_{i,t} + E_{i,t}) / (D_{i,t-1} + E_{i,t-1})]$

DebtGrowth $_{i,t} = \ln (D_{i,t} / D_{i,t-1})$, EquityGrowth $_{i,t} = \ln (E_{i,t} / E_{i,t-1})$

DebtRatio $_{i,t-1} = D_{i,t-1} / (D_{i,t-1} + E_{i,t-1})$,

Size $_{i,t} = \ln (\text{no. of Employees})$.

TABLE II
Regression results for the relationship between profitability and capital growth for small firms

$$P_{i,t} = \alpha + \beta_1 \text{CapitalGrowth}_{i,t} + \beta_2 \text{EconGrowth}_t + \beta_3 P_{i,t-1} + \sum_{j=4}^9 \beta_j \text{IndDummy}_{i,j} + \beta_{10} \text{DebtRatio}_{i,t-1} + \beta_{11} \text{Size}_{i,t} + \varepsilon_{i,t}$$

Independent variable	Coefficient value	Standard deviation	t -statistic	p -value
Intercept	-0.052	0.03	-1.72	0.080
Capital growth rate	0.035	0.006	6.13**	0.000
Economic growth rate (%)	1.256	0.400	3.15**	0.002
Profitability in year $t - 1$	0.589	0.025	23.6**	0.000
Plastic industry dummy	0.005	0.006	0.92	0.360
Steel industry dummy	0.003	0.006	0.52	0.602
Food industry dummy	-0.022	0.007	-3.03**	0.002
Textile industry dummy	0.003	0.007	0.48	0.632
Mechanic industry dummy	0.005	0.006	0.91	0.360
Electronic industry dummy	0.013	0.006	2.20**	0.028
Debt ratio in year $t - 1$	-0.045	0.009	-4.91**	0.000
Size	0.002	0.002	0.91	0.363

F -value = 75.12 adjusted R^2 = 0.347

Notes:

See Table I for definitions of variables.

** t -value significantly different from zero at the significant level of 5%.

perform the market. Finally, profitability appears to be negatively related to previous year's debt ratio. Higher debt ratio in the previous year may also indicate lower profitability in previous years, which forces small firms to rely more on debt financing.

Table III presents regression results for the relationship between profitability and different financing sources. The results are consistent with the hypothesis of a positive relationship between profitability and equity financing, and a negative relationship between profitability and debt financing. The estimated coefficient is 0.045 with a *t*-value of 11.06 for the independent variable of equity growth rate. Moreover, the estimated coefficient is -0.009 with a *t*-value of -2.31 for the independent of debt growth rate. These results indicate that the more likely small firms are able to provide funding through equity source, the more likely they are able to undertake profitable investment projects. In contrast, for firms that rely more on the less convenient, and in general more expensive financing source of debt, these firms tend to experience lower profitability.

Our results are compatible with empirical findings documented by other researchers. In

particular, our results of positive relationship between profitability and capital growth are consistent with those documented by Geroski et al. (1997) and Echevarria (1997) although their results are based mainly on large firms. Moreover, our results of the negative relationship between profitability and debt financing are consistent with those documented by Davidson and Dutia (1991), Ballantine et al. (1993), Hughes (1997), among others. However, our results also indicate that profitability is significantly positively related to external economic conditions and previous profitability for small firms.

To provide a comparison, results for large firms are also presented. In general, large firms have more stable cash flows and can access financial markets more conveniently. They should be more competitive than small firms in undertaking profitable investment projects. Moreover, given their more strong financial position, larger firms should be less affected by changing economic conditions than small firms.

Table IV presents summary statistics of financial variables for the selected large firms. The results indicate that large firms have higher profitability than small firms. The average ratio of

TABLE III
Regression results for the relationship between profitability and capital source for small firms

$$P_{i,t} = \alpha + \beta_1 \text{DebtGrowth}_{i,t} + \beta_2 \text{EquityGrowth}_{i,t} + \beta_3 \text{EconGrowth}_t + \beta_4 P_{i,t-1} + \sum_{j=5}^{10} \beta_j \text{IndDummy}_{i,j} + \beta_{11} \text{DebtRatio}_{i,t-1} + \beta_{12} \text{Size}_{i,t} + \varepsilon_{i,t}$$

Independent variable	Coefficient value	Standard deviation	<i>t</i> -statistic	<i>p</i> -value
Intercept	-0.023	0.030	-0.77	0.441
Debt growth rate	-0.009	0.004	-2.31**	0.020
Equity growth rate	0.045	0.004	11.06**	0.000
Economic growth rate (%)	1.120	0.388	2.88**	0.004
Profitability in year <i>t</i> - 1	0.549	0.025	22.3**	0.000
Plastic industry dummy	0.003	0.005	0.60	0.553
Steel industry dummy	0.004	0.005	0.80	0.426
Food industry dummy	-0.026	0.007	-3.72**	0.000
Textile industry dummy	0.001	0.007	0.14	0.890
Mechanic industry dummy	0.003	0.006	0.58	0.564
Electronic industry dummy	0.008	0.006	1.38	0.169
Debt ratio in year <i>t</i> - 1	-0.072	0.009	-7.81**	0.000
Size	0.002	0.002	0.70	0.485

F-value = 79.7 adjusted *R*² = 0.382

Notes:

See Table I for definitions of variables.

** *t*-value significantly different from zero at the significant level of 5%.

TABLE IV
Summary statistics of financial variables for large firms over 1992–1997

Variables	Mean value	Mode value	Maximum value	Minimum value	Standard deviation
Profitability	0.062	0.02	1.25	-1.02	0.17
Capital growth rate	0.15	0.13	2.12	-0.95	0.22
Debt growth rate	0.14	0.25	4.14	-2.29	0.38
Equity growth rate	0.15	0.09	2.75	-3.86	0.30
Economic growth rate (%)	6.40	6.770	6.770	5.670	0.40
Profitability in year $t - 1$	0.059	0.02	1.35	-0.92	0.15
Plastic industry dummy	0.174	0	1	0	0.38
Steel industry dummy	0.120	0	1	0	0.32
Food industry dummy	0.082	0	1	0	0.28
Textile industry dummy	0.143	0	1	0	0.35
Mechanic industry dummy	0.116	0	1	0	0.32
Electronic industry dummy	0.230	0	1	0	0.42
Debt ratio in year $t - 1$	0.45	0.48	0.99	0.02	0.17
Size	6.12	5.70	9.90	1.38	1.01

Notes:

See Table I for definitions of variables.

pre-tax income divided by net sales is 6.2% for large firms, which is about two-thirds higher than the 3.7% for small firms. Moreover, the average capital growth rate is 15% for large firms, which is more than one-third higher than the 11% for small firms. Thus, large firms appear to be more profitable and invest more than small firms. Moreover, large firms appear to obtain financing sources about equally from debt and equity where the debt growth rate is 14% and the equity growth rate is 15%.

Table IV also indicates that the debt ratio is lower for large firms than for small firms. The average debt ratio in year $t - 1$ is only 45% for large firms, which is lower than the 60% for small firms as shown in Table I. It is likely that the lower debt ratio for large firms is contributed by their higher profitability and thus stronger equity base through retaining earnings. For large firms, the lower debt ratio indicates their stronger debt capacity in raising money through debt. With an average pre-tax profit rate of 6.2%, large firms finance their investments approximately equally by debt and equity (debt growth rate 14% and equity growth rate 15%) while at the same time maintaining a lower debt ratio of 45%. In contrast, with a lower pre-tax profit ratio of 3.7%, small firms rely more on equity financing (debt growth rate 9% and equity growth rates 13% as shown in

Table I) while at the same time having a higher average debt ratio of 60%.

Table V presents regression results for the relationship between profitability and capital growth for large firms. The results indicate a significantly positive relationship between profitability and capital growth. For large firms, the estimated coefficient for the independent variable, CapitalGrowth, is 0.104 with a t -value of 8.47. In comparison, the corresponding coefficient is 0.035 with a t -value of 6.13 for small firms. Thus, the relationship between profitability and capital growth is even stronger for large firms than for small firms. This result suggests that, like small firms, large firms attempt to elevate profitability through capital investment. Alternatively, the higher profitability may contribute to higher capital growth for large firms. The positive relationship between profitability and capital growth for large firms is consistent with previous research documented by Geroski et al. (1997) and Echevarria (1997).

Like small firms, large firms' profitability is significantly related to previous profitability. However, unlike small firms, large firms are less affected by external economic conditions. The estimated coefficient for the independent variable, EconGrowth, is 0.43, which is insignificant with a t -value of 0.70. Finally, unlike small firms,

TABLE V
Regression results for the relationship between profitability and capital growth for large firms

$$P_{i,t} = \alpha + \beta_1 \text{CapitalGrowth}_{i,t} + \beta_2 \text{EconGrowth}_t + \beta_3 P_{i,t-1} + \sum_{j=4}^9 \beta_j \text{IndDummy}_{i,j} + \beta_{10} \text{DebtRatio}_{i,t-1} + \beta_{11} \text{Size}_{i,t} + \varepsilon_{i,t}$$

Independent variable	Coefficient value	Standard deviation	<i>t</i> -statistic	<i>p</i> -value
Intercept	0.012	0.044	0.27	0.787
Capital growth rate	0.104	0.012	8.47**	0.000
Economic growth rate (%)	0.431	0.620	0.70	0.486
Profitability in year <i>t</i> – 1	0.445	0.018	24.5**	0.000
Plastic industry dummy	0.003	0.009	0.29	0.768
Steel industry dummy	–0.005	0.010	–0.55	0.584
Food industry dummy	0.010	0.011	0.86	0.389
Textile industry dummy	–0.014	0.010	–1.45	0.145
Mechanic industry dummy	0.005	0.010	0.50	0.614
Electronic industry dummy	–0.001	0.009	–0.155	0.877
Debt ratio in year <i>t</i> – 1	–0.124	0.015	–7.76**	0.000
Size	0.006	0.003	2.46**	0.014

F-value = 110.0 adjusted *R*² = 0.273

Notes:

See Table I for definitions of variables.

** *t*-value significantly different from zero at significant level 0.05.

profitability appears to be positively related to firm size for large firms. The estimated coefficient for the independent variable, Size, is 0.006 with a *t*-value of 2.46 for large firms. In contrast, the impact of firm size on profitability is insignificant for small firms. In brief, for large firms, the profitability appears to be affected more by firm-specific characteristics such as previous profitability and firm size, and less by external economic conditions. Since large firms tend to have more stable cash flows, their profitability is less affected by changing external economic conditions.

Table VI presents regression results for the relationship between profitability and different financing sources for large firms. The results indicate a significantly positive relationship between profitability and equity financing, and a significantly negative relationship between profitability and debt financing. For large firms, the estimated coefficient is 0.148 with a *t*-value of 17.53 for the independent variable, EquityGrowth, and –0.026 with a *t*-value of –3.94 for the independent variable, DebtGrowth.

Thus, the positive relationship between profitability and equity financing also applies to larger firms. Although large firms have more debt capacity to use debt financing than small firms,

equity remains a more convenient way to finance project investment for large firms. Like small firms, large firms with more retained earnings are associated with higher profitability.

4. Conclusion

This paper examines the relationship between profitability and financial capital for 1,276 small firms in Taiwan over the period 1992–1997. The results indicate a statistically positive relationship between profitability and capital growth. When financial capital is further divided into debt and equity, the results indicate a significantly positive relationship between profitability and equity financing, but a significantly negative relationship between profitability and debt financing. Moreover, the profitability of small firms is positively related to both the external economic conditions and the firms' previous profitability.

These results are consistent with the explanation that financial capital plays an important role in the profitability of small firms. Thus, small firms with more adequate financial capital are more likely to experience higher profitability. Alternatively, small firms with higher profitability are more likely to retain earnings for future capital needs. Finally, profitability relates differently to

TABLE VI
Regression results for the relationship between profitability and capital source for large firms

$$P_{i,t} = \alpha + \beta_1 \text{DebtGrowth}_{i,t} + \beta_2 \text{EquityGrowth}_{i,t} + \beta_3 \text{EconGrowth}_t + \beta_4 P_{i,t-1} + \sum_{j=5}^{10} \beta_j \text{IndDummy}_{i,j} + \beta_{11} \text{DebtRatio}_{i,t-1} + \beta_{12} \text{Size}_{i,t} + \varepsilon_{i,t}$$

Independent variable	Coefficient value	Standard deviation	t-statistic	p-value
Intercept	0.047	0.042	1.11	0.266
Debt growth rate	-0.026	0.007	-3.94**	0.000
Equity growth rate	0.148	0.008	17.53**	0.000
Economic growth rate (%)	0.210	0.600	0.35	0.725
Profitability in year $t - 1$	0.421	0.017	24.0*	0.000
Plastic industry dummy	-0.001	0.009	-0.15	0.884
Steel industry dummy	-0.002	0.010	-0.20	0.835
Food industry dummy	0.009	0.010	0.88	0.378
Textile industry dummy	-0.018	0.009	-1.94	0.055
Mechanic industry dummy	0.001	0.010	0.10	0.910
Electronic industry dummy	-0.011	0.009	-1.29	0.196
Debt ratio in year $t - 1$	-0.167	0.016	-10.6**	0.000
Size	0.006	0.002	2.60**	0.009
F-value = 128.4 adjusted R^2 = 0.323				

Notes:

See Table I for definitions of variables.

** t -value significantly different from zero at significant level of 0.05.

debt financing and equity financing. Specifically, small firms with adequate equity source are associated with higher profitability. In contrast, small firms that rely more on debt financing tend to experience lower profitability.

For comparison purpose, this paper also examines the profitability for a sample of 883 large firms. Unlike small firms, large firms experience higher profitability and lower debt ratio. Moreover, the profitability of large firms is less affected by external economic conditions but is more positively related to firm size than small firms. Finally, like small firms, the profitability of large firms is positively related to equity growth rate but is negatively related to debt growth rate.

Acknowledgements

The authors gratefully acknowledge the insightful comments of the anonymous referees. Any remaining errors are the authors' sole responsibility.

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