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補助專題研究計畫成果
報告

1997年兩稅合一改革對系統
風險之影響

Impact of 1997 Taiwan tax
reform on systematic risk

計畫類別：個別型計畫

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一、中文摘要

本研究目的係分析臺灣 1997 年稅率調降對銀行系統風險之影響。理論上，所得稅稅率越高銀行系統風險越低，相反的，臺灣 1997 年所得稅稅率調降，將導致銀行系統風險之提高。實證結果與理論之預測相符，1998 年後臺灣銀行系統風險顯著提高。

關鍵詞：系統風險

Abstract

The purpose of this study is to examine how 1997 Taiwan Tax Reform can be employed to evaluate change of firm systematic risk. It has been shown in prior literature that firm risk depends on a combination of many firm characteristics such as production technology, product market, and sources of funds. We show that the tax rate change in 1997, both in theory and empirical results, leads to higher systematic risk in Taiwan banking industry.

Keywords: systematic risk

二、Motivation and Empirical Results

The purpose of this study is to examine how 1997 Taiwan Tax Reform can be employed to evaluate firm systematic risk. It has been shown in prior literature that firm risk depends on a combination of many firm characteristics such as production technology, product market, and sources of funds. In other words, the sources of firm risk can be traced to intrinsic business risk, operating risk and financing risk. Intrinsic risk reflects uncertainty about the changes in product demand (unit sales price and quantity sold), and production factor prices and input efficiency. Operating risk is influenced by firm production technology, i.e., how a firm produces its products. For example, capital-intensive firms tend to

utilize more fixed input such as heavy equipment than labor-intensive firms. Financing risk is related to the leverage through borrowings. Hence, financial statements containing information about asset and capital structures will exhibit the differences in firm production technology and the relative sources of funds.

A considerable amount of theoretical research decomposes systematic risk (beta) into its corporate determinants. The composition of a company's capital and asset structures has significant implications for users of accounting information. Financial leverage and operating leverage are the net results of a company's capital and asset investment decisions, and are important variables in issues concerning the risk of a firm.

Hamada(1969) and Hamada(1972) developed a model relating market beta before and after debt financing under the assumption that the validity of CAPM and the proposition of Modigliani and Miller hold, and firms can borrow freely at risk-free rates. Hamada(1969,1972) resolve the risk into two components – an intrinsic operating risk and financial risk. His results show that

$$S = \left(1 + \frac{D}{E}\right) S_u$$

Where D is market value of total debts;

E denotes market value of total equity;

S_u denotes the beta with no debt financing.

The risk of a firm will increase linearly with the debt-equity ratio. The systematic risk of a levered firm consists of two components: (a) a financial leverage component, and (b) an operating component. Yagill (1982), Arditti, Levy & Sarnat (1977), Brennan(1970), Farrar and Lelwyn(1967), and Stiglitz(1973) investigate the effect of a corporate tax subsidy to debt

on the risk of a firm, and the derived relation is as follows:

$$S = \left(1 + \frac{(1-T)(1-T_e)D}{(1-T_d)E} \right) S_u$$

Where T is the corporate tax rate, and T_e and T_d are the marginal tax rates applicable to holders of the firm's equity and debt securities respectively.

Bierman and Oldfield (1979) and Conine (1980) extend Hamada's risk relation to the risky debt valuation. Financial risk can further be decomposed into the following relation:

$$S = S_u + (S_u - S_{debt}) \left(\frac{(1-T)(1-T_e)D}{(1-T_d)E} \right)$$

where S_{debt} is the beta risk of debt security.

Operating risk is examined in Rubinstein(1973), Gahlon and Gentry (1982), and Mandelker and Rhee (1984). Operating risk consists of intrinsic business risk of a firm without financial and operating leverage, and risk reflecting the degree of operating leverage, which is defined as the percentage change in earnings that is associated with a given percentage change in the units produced and sold.

Lev (1974) investigates the relationship between operating leverage and risk, and shows that two variables are positively correlated analytically and empirically. Montgomery and Singh(1984) addresses the relationship between diversification strategy and systematic risk, and find that betas for unrelated diversifiers are significantly higher than those of other firms. Hill and Stone(1980) studies the use of accounting betas and accounting measures of financial

structure to explain and predict market betas. It is shown that both changes in financial structure and systematic operating risk are significant determinants of period-to-period changes in market betas. Amit and Livnat(1988) examines the effect of diversification on the operating risk and financial risk of a firm. It documents that firms reduce their operating risk by diversification and increase financial leverage to take advantage of tax benefits. Beaver, Kettler, and Scholes(1970) investigates the association between market determined and accounting determined risk measures, supports the contention that accounting measures of risk are impounded in the market-price based risk measure.

From prior literature, it shows theoretically that lower corporate income tax rate (T) will increase the systematic risk.

The market model is used to measure the systematic risk. In capital asset pricing model, market beta risk is the risk associated with the systematic, or undiversifiable risk component, measured by the beta of Sharpe's market model.

$$S_i = b_0 + b_1 I + \sum b_i O_i + v$$

I is a dummy variable, 1 after 1997, 0 otherwise. O stands for all the other accounting and non-accounting information relevant for evaluating bank systematic risk.

The empirical results support our prediction that the corporate income tax rate change in 1997 leads to higher systematic risk in Taiwan banking industry.

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