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Comment on Alan J. Auerbach, Kevin Hassett and Jan Södersten: Taxation and Corporate Investment: The Impact of the 1991 Swedish Tax Reform

Peter Birch Sørensen*

This paper evaluates the impact of the Swedish tax reform on the cost of corporate capital and the level of corporate investment in equipment.

The task is complicated by several factors. First of all, as the tax reform act was implemented, Sweden plunged into the worst recession since the Great Depression of the 1930s. Disentangling the effects of the recession and the isolated impact of the tax reform is bound to be difficult, since the recession and the associated expectational effects were obviously abnormal.

Second, prior to the tax reform, Sweden had a unique investment fund system. Unfortunately there is no theoretical consensus on the effect of these investment funds on the cost of corporate capital. As the authors show, one must distinguish at least four different "investment regimes": i) accumulated investment fund contributions are always sufficient to finance all investment, and releases from investment funds are permitted (regime 2a); ii) investment fund contributions would be sufficient to finance all investment, but releases are not permitted (regime 2b); iii) investment fund contributions are always maximized, but insufficient to fund all investment (regime 3), or iv) investment fund releases are permitted, but contributions to investment funds are not maximized, because this would reduce the firm's ability to pay dividends due to the legal constraint that dividends cannot exceed taxable net profits (regime 4). As illustrated by Tables 2 and 3 in the paper, the impact of the investment

* *The discussant is Professor of Economics at the University of Copenhagen and Senior Research Fellow at the Economic Policy Research Unit, Copenhagen.*

fund system on the cost of capital may differ substantially across these different regimes, so it is important to evaluate which regime was predominant before and after the tax reform.

A third complicating factor is that expected changes in rates of taxation and tax allowances will generate intertemporal substitution effects on investment. It is therefore also important to evaluate whether and to what extent the tax reform and other changes in tax policy over the period were anticipated.

Faced with these difficulties, the authors adopt what seems to be a reasonable two-pronged strategy. On the one hand, they look at data on the degree of utilization of tax benefits and investment funds to check which investment regime seems to have been the predominant one over the period. These data suggest that most Swedish corporations have been in the dividend-constrained regime 4 where the corporate tax system can be shown to be close to neutral towards investment.

On the other hand, the authors estimate investment equations under alternative assumptions regarding the investment regime to see which equation gives the best fit, hoping in this way to identify the relevant investment regime and the associated policy-induced change in the cost of capital and in corporate investment. The results of this exercise are somewhat disappointing, since all investment equations seem to perform about equally well, regardless of the investment regime assumed in the calculation of the cost of capital. As the authors point out, the fluctuations in interest rates and profitability over the estimation period have swamped the effects of changes in tax policy, and the 1991 tax reform seems to have had only a minor impact on corporate investment compared to shifts in other explanatory variables.

In the light of earlier studies such as that by Dufwenberg *et al.* (1994), the finding that tax policy variables have had a limited effect on investment does not come as a surprise. I believe that the main contribution of the paper is the careful distinction between the different possible investment fund regimes combined with explicit allowance for the legal dividend constraint which has so often been ignored in other studies. While I appreciate this aspect of the authors' work, one of my functions as a discussant is to point out potential shortcomings of their study. Although I am reluctant to suggest further elaborations of a cost-of-capital model which is already rather complicated due to the complexities of the tax system, I will nevertheless mention two extensions which might shed additional light on the role of taxes in corporate investment decisions.

1. Allowing for endogenous financial policy

In models without uncertainty and agency costs like the one in this paper, it is customary to postulate an exogenous fixed debt-equity ratio, since the model would otherwise tend to imply an empirically implausible financial corner solution driven entirely by asymmetries in the tax system. However, one of the explicit goals of the Swedish tax reform was to introduce greater neutrality in the tax treatment of the different modes of investment finance. In line with this objective, Södersten (1993) found that the 1991 tax reform act did in fact reduce the tax incentive to use debt finance rather than equity finance. From this perspective it would have been desirable if the present study had utilized a model which allowed for possible tax effects on corporate financial policy.

Of course, if it can be verified that debt-equity ratios are in practice very stable despite significant changes in tax policy, it might do no harm to ignore tax effects on corporate financial policy, but then one would like to be confronted with the relevant evidence on corporate financing patterns. For analytical reasons the authors assume a constant ratio of debt to market value rather than a constant debt-capital ratio. While I appreciate that a constant debt-market value ratio implies simpler expressions for the cost of capital, I would also guess that the fluctuations in stock prices observed empirically would tend to cause non-negligible fluctuations in debt-value ratios, thus violating the assumption underlying the authors' cost-of-capital formulas.

Yet, there may be a good reason why the authors have chosen not to endogenize corporate financial policy: when debt policy is exogenous, a binding dividend constraint implies that tax allowances (including the deductions for investment fund contributions) are not fully utilized, because full utilization would reduce taxable profits to an extent which would prevent the payment of dividends. The existence of the dividend constraint might then provide the explanation for the empirical observation that Swedish corporations have tended not to utilize all available tax allowances. By contrast, if debt policy were endogenized in the authors' model, and if there were no non-tax benefits from the use of regular debt finance, firms would want to maximize their use of interest-free "tax debt" (i.e., they would want to defer tax payments as long as possible by taking full advantage of possibilities for accelerated depreciation and similar provisions) before they resorted to interest-bearing regular debt[2].

[2] This is demonstrated formally in Kanniainen and Södersten (1995).

Similarly, firms would want to maximize their contributions to investment funds as long as the tax rate τ exceeds the fraction b of the contribution which must be deposited in an interest-free Central Bank account, as was the case in Sweden for much of the period before 1985. Thus, an optimal corporate financial policy would suggest the following hierarchy of the different sources of investment finance: First, use the retained earnings generated by maximum exploitation of ordinary fiscal depreciation allowances, i.e., use the most advantageous form of "tax debt". Second, when $\tau > b$, use all the tax debt that can be generated by maximizing the contribution to the investment fund. Third, if the tax system involves some "double taxation" of corporate equity income, as has been the case in Sweden, use regular debt finance up to the point allowed by the dividend constraint.

The data in Table 2 of the paper indicate that firms have in fact made greater use of ordinary fiscal depreciation allowances than of the investment fund system, but at the same time the table clearly shows that Swedish corporations have not exploited all available opportunities to use tax debt rather than regular debt. This seemingly inexplicable fact may be the reason why the authors have chosen not to endogenize the firm's debt policy in their theoretical model.

However, in recent joint work with Kanniainen, one of the authors has in fact offered an explanation for the puzzle of unexploited tax allowances (see Kanniainen and Södersten, 1994). Kanniainen and Södersten argue that the use of debt finance is associated with non-tax benefits, since debt finance implies some monitoring of the firm's management by debtholders such as banks, thereby reducing the agency costs of monitoring incurred by the firm's shareholders. The optimal financial policy is then attained where the marginal saving of monitoring costs resulting from the use of debt finance is just sufficient to outweigh the marginal cost of using interest-bearing regular debt rather than interest-free "tax debt". While this theory might seem somewhat speculative, and while other authors such as Chirinko (1987) have suggested that increased reliance on debt leads to an *increase* in agency costs, it would have been interesting to see if an attempt to endogenize corporate financial policy through the introduction of an agency cost function would have generated expressions for the cost of capital that could improve the fit of the authors' investment equations.

2. The role of personal taxes

The issue of endogenous financial policy is closely linked with the role of personal taxes in determining the cost of corporate capital. Indeed, in the model of Kanniainen and Södersten (1994) referred to above, the firm's financial policy and its cost of capital is affected only by personal taxes, whereas the corporate income tax works like a neutral cash flow tax when the dividend constraint is binding, because an increase in equity-financed investment will then enable the firm to increase its deductions for depreciation by a corresponding amount.

Personal taxes on interest and on shareholder income affect the cost of capital via their impact on the cost of corporate finance. If the marginal shareholder is a domestic resident, the cost of finance would obviously be determined by domestic personal tax rates. However, in a small open economy where domestic markets for stocks and bonds are integrated in world capital markets, domestic stock prices would tend to be governed by the arbitrage behavior of *foreign* investors. In other words, when the marginal shareholder is a foreign resident, domestic personal tax rates on income from shares and bonds will not influence the cost of corporate capital but will only determine the allocation of domestic portfolios between stocks and bonds and the allocation of the supply of shares in domestic corporations between domestic and foreign investors (see Sørensen, 1995).

The authors' calculation of the cost of finance is not quite transparent, but they do not seem to allow for effects of changes in domestic personal tax rates. Hence they make the implicit assumption that the cost of Swedish corporate finance is determined from abroad. This important assumption ought to have been made explicit. Moreover, the identity of the marginal shareholder is ultimately an empirical question, so it would have been interesting to see if allowance for domestic personal tax effects on the cost of finance would have increased the statistical significance of the cost of capital as an explanatory variable. In case it had not, this would have provided indirect evidence that the Swedish stock market is effectively integrated in the world capital market. This may well be a reasonable assumption for the later part of the estimation period, but it may not have been the case all the way back to 1969.

3. Concluding remarks

In summary, the authors have made a valuable contribution to the analysis of the incentive effects of the Swedish investment fund system the effects of which have previously been a source of theoretical controversy. Moreover, the authors' conclusion that the tax reform act probably had a very limited direct impact on corporate investment seems plausible. Still, one would have liked to see a discussion of the potential role of personal taxes and of endogenous choice of corporate financial policy.

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