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AN ALTERNATIVE CORPORATION TAX:
Implications for Efficiency of
Investment and Valuations of Shares

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ABSTRACT: The paper studies an alternative corporation tax that has the same major advantages as the pure cash-flow corporation tax. First, the effective marginal tax rate is shown to be zero as it is the return on intramarginal capital that is being taxed. Thus, no problem of double-taxation arises at the margin. Second, the tax allows for adjustment of the tax base for capital risk, a property not shared by the expected economic depreciation approach. However, as it is in the case of the cash-flow tax, the corporation tax is capitalized in share prices. The resulting undervaluation can be avoided by applying a split tax rate, which also eliminates double taxation of dividends on intramarginal capital. Using new share issues as the marginal source of funds tends to raise the required return on investment, but this is regarded as a transitory mechanism.

KEY WORDS: corporation tax, efficiency of investment, valuation of shares

I Introduction

A favourite of many economists, the cash-flow corporation tax[1], has so far eluded wider acceptance by policy-makers as an alternative to the traditional corporation tax. The major weaknesses associated with the traditional corporate income tax arise from the impossibility of implementing the proper tax base. For this reason alone, the marginal investment is subject to double taxation, i.e. to the corporation tax and the capital gains tax, over a period when a firm does not change its equity policy. Moreover, as suggested by Auerbach (1983) and Bulow and Summers (1984), predetermined depreciation deductions based on the expected economic depreciation distort the marginal efficiency of risky investments in particular. The reason is that the associated capital risk is not shared by the tax collector. Finally, there is an important discriminatory mechanism in that the corporation tax of the traditional type really allows for a cash-flow treatment of many less physical investments like R&D expenditure.

The above conclusions suggest even if the tax base of corporations has been diluted in many economies over the past few years, this is a reflection only of a decline in the average tax rates on corporate income. More importantly, the distortions at the margin have not been eliminated in the process of revisions in the tax structures. The crucial distinction between the average tax rate and the marginal tax rate is very much emphasized in the following sections.

Under the current circumstances, one is strongly motivated to look for alternative approaches to taxing corporations, i.e. those which can be

predicted to share the desirable features of the cash-flow corporation tax. It is argued that such a tax actually exists in the Nordic countries (Sweden, Finland, Norway) in the form of non-predetermined tax allowances. It will be shown that when the firm pursues the standard equity policy with a positive payout ratio and no new share issues (usually associated with a "long-run" equilibrium policy), the corporation tax falls entirely on intramarginal profits. Hence, it imposes no discrimination against new capital since the marginal return avoids the conventional double taxation (i.e. it is subject to the capital gains tax, only). Second, it is argued that the allowable deductions can be structured in a way which allows adjustment for capital or asset price risk in a feasible way.

However, while the marginal investment avoids the corporation tax, we show that the tax will be capitalized in equilibrium share values if retained earnings are the marginal source of funds. This follows because if the firm increases its cash dividends by one more unit, there will be a related increase in its tax liability. This results from the natural constraint which dictates that dividends are not allowed to exceed the reported profits after the corporation tax. Consequently, when retained earnings are the marginal source of funds, the corporation tax forms, surprisingly, an additional cause for the widely discussed "undervaluation" of shares.[2] The result that the corporation tax is capitalized in the share value is important not merely because it contradicts the prediction of the "new view" of equity finance. As suggested recently by King (1986), undervaluation of shares creates incentives for takeovers as an alternative to direct investments. These incentives will hence potentially be enhanced if the corporation tax of the Nordic type is applied as are the

incentives of retaining profits. This is a problem if dividends are heavily taxed. Leaving aside the actual situation in practice, one should note here that even if the marginal return on capital avoids the double taxation as stated above, the dividends which are being paid from intramarginal profits are subject, in principle, to double taxation (i.e. they are taxed both at the corporation tax rate and the dividend tax rate). The double taxation of dividends can be eliminated and the share undervaluation can be reduced if a split rate form of corporation tax is applied.[3] What is interesting about the dividend relief is that it eliminates, at least partly, the tax-based incentives for takeovers and tax-based incentives for investment by existing firms.

Section II of the current paper derives the above results. If the firm, in some period, issues new shares, the traditional results are obtained. This is shown in section III. More specifically, the equilibrium dictates that share values do not deviate from the replacement values. Moreover, taxes impose an excessive required return on marginal capital. This is, however, viewed as a temporary mechanism.

II Equilibrium Share Prices

Let θ denote the tax rate on dividens and c that on capital gains. The assumption $\theta > c$ implies that a unit of dividends (D) is worth only $(1-\theta)/(1-c)$ units of capital gains. Given new equity issues at a rate V^N per unit of time, the current value of existing shares is (cf. Auerbach (1979))

$$(2.1) \qquad V(t_1) = \int_{t_1}^{\infty} [(1-\theta)D(t)/(1-c) - V^N(t)]\exp(-\rho'(t-t_1))dt.$$

The discount rate is $\rho' = \rho/(1-c)$, where ρ is the owners' opportunity cost. This holds regardless of whether new share issues or retained earnings are used as the marginal source of finance. As in Boadway and Bruce (1983), one wants to differentiate between the accounting value of the firm (B) and its capital, valued as the replacement prices ($p_K K$). Let δ denote the (expected) current rate of depreciation of K as the factor of production. Let δ^* stand for the rate of tax depreciation, applied to the underpreciated accounting value of capital. If I denotes gross investment, one has

$$(2.2) \qquad p_K I = p_K(\dot{K} + \delta K) = \dot{B} + \delta^* B.$$

The difference between Boadway and Bruce (1983) and here is that δ^* is regarded as the control variable of the firm instead of being a predetermined constant. It has to satisfy $0 \leq \delta^* \leq \bar{\delta}$, where $\bar{\delta}$ is given by the tax law. The assumption throughout is that $\bar{\delta} > \delta$. If the firm applies $\delta^* > \delta$, it is most reasonable to interpret this as a tax debt.

Assume also throughout that the ordinary debt is not the marginal source of funds. This can be justified by making use of the intuitively appealing idea that debt capacity is limited due to reasons like informational asymmetries, as suggested by Stiglitz and Weiss (1981). For convenience, the debt capacity is set equal to zero. Then the reported profits can be expressed as follows

$$(2.3) \qquad P = p\pi(K) - \delta^* B$$

where $p\pi(K)$ stands for nominal earnings with $\pi_K > 0$, $\pi_{KK} < 0$. For the subsequent discussion, it is reasonable to think that the tax allowance decomposes as $\delta^*B \equiv \delta^*_I B + \delta^*_M B$. Here $\delta^*_I B$ and $\delta^*_M B$ can be interpreted as the tax allowances associated with intramarginal and marginal capital, respectively.

If the split rate tax system is applied, current dividends can be deducted from the tax base up to the fraction $0 \leq \gamma \leq 1$. Hence, the dividend payments are viewed to be constrained by

$$(2.4) \qquad 0 \leq D \leq \omega P$$

with $\omega = (1-\tau)/(1-\gamma\tau)$, where τ is the corporation tax rate. In the classical system $\gamma = 0$, while it is positive in the split rate system. Hence, in the latter system a unit of the distributed dividends gives rise to a tax shield of size $\gamma\tau$.

Substitution of (2.4) into (2.3) reveals that the dividend constraint transforms the constraint on the feasible rate of tax allowance into the following expression

$$(2.5) \qquad \delta^* \leq \min(\bar{\delta}, \bar{\delta}') \qquad \text{with } \bar{\delta}' = [p\pi(K) - D/\omega]/B.$$

According to (2.5), there are two regimes where a firm might be.

Finally, current investment is given by the after-tax cash flow including new share issues

$$(2.6) \qquad p_K I = (1-\tau)p\pi(K) - (1-\gamma\tau)D + \tau\delta^*B + V^N.$$

Assume now that the firm is pursuing an equilibrium policy with no planned new share issues. Thus, the firm is generating enough profits to finance its replacement investment and to pay positive dividends. To derive an expression for the marginal valuation of the firm's capital, let us consider the program that maximizes the following Hamiltonian (in current values) adjusted for the associated Kuhn-Tucker conditions.

$$(2.7)\qquad H_1(D(t),\delta^*(t);K(t),B(t)) = \frac{1-\theta}{1-c}D(t) + \lambda^K(t)\dot{K}(t) + \lambda^B(t)\dot{B}(t) + \alpha(t)(\omega P(t) - D(t)) + \beta_1(t)(\bar{\delta} - \delta^*(t)) + \beta_2(t)(\bar{\delta}'(t) - \delta^*(t)).$$

D(t) and $\delta^*(t)$ are regarded as the controls. K(t) and B(t) are the state variables, while λ^K and λ^B are interpreted as the marginal valuations of the state variables, ceteris paribus. Note that $\beta_i > 0$ implies $\beta_j = 0$ when $i \neq j$.

In equilibrium, the valuation of the marginal capital is given by

$$(2.8)\qquad \frac{\partial \hat{H}_1}{\partial \hat{I}} = \frac{\partial \hat{V}}{\partial \hat{K}} + \frac{\partial \hat{V}}{\partial \hat{B}} = \hat{\lambda}^K + p_K\,\hat{\lambda}^B.$$

From (2.2), the equilibrium policy is characterized by

$$(2.9)\qquad \hat{\delta}^* = \delta.(p_K\hat{K}/\hat{B}) = p_K\hat{I}/\hat{B} > 0.^4$$

Note that for (2.9) to hold, the equilibrium accounting value of the

firm, $\hat{B}$, has to be sufficiently high.[5] Moreover, the discussion on the information contents of the B(t)-variable at the end of this section reveals that it would be wrong to impose some specific initial values for the state variables. Rather, one wants to derive results which hold for any (still positive) initial values of the controls and states. The first-order conditions are[6] as follows

$$(2.10) \qquad \frac{1-\theta}{1-c} - (\lambda^K \frac{1}{p_K} + \lambda^B)(1-\gamma\tau) - \alpha - \eta_2(1/\omega) = 0$$

$$(2.11) \qquad \eta_1 + \eta_2 = (\lambda^K \frac{1}{p_K} + \lambda^B)\tau - \lambda^B - \alpha\omega$$

$$(2.12) \qquad (\lambda^K \frac{1}{p_K} + \lambda^B)(1-\tau)p\pi_K - \lambda^K(\delta + \rho') + (\alpha\omega + \eta_2)p\pi_K = -\dot{\lambda}^K$$

$$(2.13) \qquad (\lambda^K \frac{1}{p_K} + \lambda^B)\tau\delta^* - \alpha\omega\delta^* - \lambda^B(\delta^* + \rho') - \eta_2 \bar{\delta}' = -\dot{\lambda}^B .$$

Here the notation $\eta_i = \beta_i/B$ (i=1,2) has been used.

It is now easily concluded that when the firm follows the above policy, the marginal valuation of additional tax shields based on a larger undepreciated accounting value ($\hat{B}$) is equal to zero.[7] To see how the taxes on capital income are reflected in equilibrium share prices, consider first firms in a regime where $\min(\bar{\delta}, \bar{\delta}') = \bar{\delta}'$. The implication is that $\beta_1 = \eta_1 = 0$. Then substituting (2.11) into (2.10) one obtains

$$(2.14) \qquad \hat{\lambda}^K/p_K = \frac{(1-\tau)(1-\theta)/(1-c)}{1-\gamma\tau}$$

Using (2.14) and (2.12) one can then express the gross required rate of return on the marginal investment as follows

$$(2.15) \qquad \pi_K = \frac{p_K}{p}\,(\delta+\rho'-\dot{p}_K/p_K).$$

The importance of these results is clear when they are compared with the more commonly existing tax systems with predetermined tax allowances. Equation (2.15) suggets that the capital investment continues up to the point where the present value of the marginal return, discounted by the rate free of the corporation tax, is equal to zero. Hence, when the firm follows the equilibrium policy, the Nordic tax system shares one of the major advantages of the cash flow corporation tax in that the effective tax rate on the marginal investment is equal to zero. The whole burden of the corporation tax falls on the old capital and hence is reflected in share prices, as can be seen from (2.14). The other effect which depresses the share prices, too, is the traditional one, as implied by the "new view of equity finance" ($\theta > c$). Note that both these mechanisms which create incentives for takeovers and retaining profits inside the firm can be counteracted by applying a split rate tax system with a dividend deduction ($\gamma > 0$). Without a split rate, one unit of cash dividends is worth capital gains of only $(1-\tau)(1-\theta)/(1-c)$.

Actually, the above results are the same for the firms in the other regime, i.e. where $\min(\bar{\delta},\bar{\delta}') = \bar{\delta}$. It is important to understand the reason for this. But let us first convince ourselves that this is

indeed the case. Set $\beta_2 = \eta_2 = 0$ and use (2.10) to obtain $\hat{\lambda}^K/p_K = (\frac{1-\theta}{1-c} - \hat{\alpha})/(1-\gamma\tau)$. Then use (2.13) to obtain $\hat{\alpha} = (\hat{\lambda}^K/p_K)\tau/\omega$ (note that $\hat{\lambda}^B = \dot{\hat{\lambda}}^B = 0$). These expressions give (2.14). Substitution into (2.12) gives (2.15). In both regimes it holds that $\hat{\alpha} > 0$, i.e. that $\hat{D} = \omega P$ in (2.4). This is so because the coefficient of D in the unconstrained Hamiltonian $\partial H_1^u/\partial D = \frac{1-\theta}{1-c} - \lambda^K(\frac{1}{p_K})(1-\gamma\tau)$ is positive when the firm follows the equilibrium policy. Use (2.14) to see this.

In order to interpret intuitively the economic mechanisms behind the above results, it is important to understand the information contents of the B(t)-variable properly. As stated in (2.2), capital investments increase the potential for future tax depreciations while the currently claimed allowances reduce it. For the efficiency condition to hold, it is essential that the firm is capable of reducing the taxable profit of the marginal investment for all future time periods to zero. For this to hold, it is crucial that some allowable deductions have been left unclaimed in the past. For any given past tax allowance policy, say $\delta^*_0 < \bar{\delta}$, the stock of unclaimed deductions is given by

$$(2.16) \qquad A(s) = \int_{-\infty}^{s} p_K I_t (e^{-\delta^*_0 t} - e^{-\bar{\delta} t})dt.$$

A(s) in a sense summarizes the past history of the firm. For the sake of realism, it has to be pointed out that A(s) may be positive for two quite different reasons. Let us for a moment go outside out model and allow for uncertainty. Then both due to the income risk and capital risk, the realized return on existing capital may be lower than was expected. Hence, for that reason alone, the firm may not be able to claim all potential allowances on intramarginal capital. Actually,

this is frequently the real situation for a significant portion of the firms and the empirical evidence is very clear on this. But for the purposes of our current analysis, it is sufficient to conclude that the presence of uncertainty makes the case of the Nordic depreciation mechanism even stronger. Profits and losses are treated more symmetrically in that tax losses and tax debts are both interest-free and that the tax losses are not lost after a given number of years as they are with the standard loss offset provisions.

Quite apart from the fact that A(s) may be positive in an unplanned sense (which provides the basic motivation for formulating the control problem of the firm without imposing an initial condition of the type $K(t_1) = B(t_1)$ or the like), it is the dividend constraint which provides another reason why $A(s) > 0$. Firms do not claim all allowable deductions because that would reduce their steady-state dividends, payable from intramarginal profits after the corporation tax. Consequently, what actually is happening is that the firms use some allowances associated with their intramarginal capital to reduce the tax liability associated with their marginal capital to zero. The tax allowance claimed in equilibrium, will not exceed the actual (ex post) economic depreciation, i.e. from (2.9) $\hat{\delta}^*\hat{B} = p_K\hat{\delta}\hat{K}$.

III New Share Issues as the Marginal Source of Funds

From time to time, new shares are issued. The well-known results is that during such periods, no dividends are paid (cf. Auerbach (1979), Edwards and Keen (1983)). However, any firm having a positive net worth must eventually start paying dividends. Moreover, new share

issues are an expensive source of funds. Hence, we assume that the firm pursues the policy of new share issues only over a limited time period, say (t_0,t_1), after which it will switch to the policy studied in the previous section.

From (2.1), the firm's objective reads

$$(3.1) \qquad V(t_0) = \max_{(V^N(t),\delta^*(t)} \int_{t_0}^{t_1} (-V^N(t))e^{-\rho' t}dt + V(t_1)$$

with the transversality condition

$$(3.2) \qquad V(t_1)e^{\rho' t_1} = (1-\theta)\hat{D}/(1-c)$$

where $\hat{D}$ was defined in footnote 7. From (3.1) one can see that new share issues give rise to capital losses on existing shares which have to be compensated. Otherwise, the current shareholders would want to change their portfolio. Hence the result that during the periods of new share issues the share prices have to be independent of any tax parameters can be interpreted as the portfolio equilibrium condition for existing owners. Hence, we have to show that a one unit increase in capital increases the aggregate (post-issue) value of the firm's shares accordingly. But we also want to find out the fraction of this appreciation which is attributed to an increase in the net present value of the future tax shields associated with the marginal investment. Intuitively, the latter will now be of positive value because it appears that the firm does not carry forward a positive stock of unclaimed allowances.

Under the policy of new share issues, the objective of the firm is to maximize, for each $t\in(t_0,t_1)$

$$(3.3)\qquad H_2(V^N(t),\ \delta^*(t);K(t),B(t)) = (-V^N(t)) + \lambda^K(t)\dot{K}(t) + \lambda^B(t)\dot{B}(t) + \beta_1(t)(\bar{\delta} - \delta^*(t)) + \beta_2(t)(\bar{\delta}'(t) - \delta^*(t)).$$

This is (again) a linear programmin problem, where V^N is assumed to be positive but no other constraints are imposed. Hence, the model can, in the first instance, be used to characterize the equilibrium with respect to the state variables. But it is also possible to conclude the optimal values of the control variables.

The first-order conditions read as

$$(3.4)\qquad \lambda^K + p_K\lambda^B = p_K$$

$$(3.5)\qquad \frac{1}{p_K}(\lambda^K + p_K\lambda^B)\tau - \lambda^B = \eta_1 + \eta_2$$

$$(3.6)\qquad \frac{1}{p_K}(\lambda^K + p_K\lambda^B)(1-\tau)p\pi_K - \lambda^K(\delta+\rho') + \eta_2 p\pi_K = -\dot{\lambda}^K$$

$$(3.7)\qquad \frac{1}{p_K}(\lambda^K + p_K\lambda^B)\ \tau\delta^* - \lambda^B(\delta^* + \rho') - \eta_2 p\pi(K)/B = -\dot{\lambda}^B.$$

Since in the financial policy regime to be studied here no dividends are being paid, the firm has no incentive to leave any tax allowances unclaimed. Thus, it will minimize its current tax liability and maximize its tax debt. Now the analysis is simplified because the case $\min(\bar{\delta},\bar{\delta}') = \bar{\delta}'$ in (2.5) is rather trivial. The total taxable profit for such a firm is zero and the firm is tax-exhausted. Obviously, the

corporation tax can have no effect on its marginal investment as the marginal tax rate is equal to zero. Hence, in the subsequent discussion firms which are tax-exhausted can be excluded. Take the derivative of the unconstrained Hamiltonian in (3.3) with respect to δ^* to find $\partial H_2^u/\partial\delta^* = [\tau - \lambda^B]B$. This is positive (see below). Hence in the current case it is optimal for the firm to follow the bang-bang solution $\delta^* = \bar{\delta}$ implying $\eta_2 = 0$. Then (since $p_K\hat{I} = p_K\delta\hat{K}$) the nominal value of new share issues per unit of time are given from (2.6) as

$$(3.8) \qquad \hat{V}^N = p_K\delta\hat{K} - (1-\tau)p\pi(\hat{K}) - \tau\bar{\delta}B.$$

Acquiring one unit of new capital gives rise to future returns both in the sense of corporate earnings and additional future tax shields. Their current values can be solved from (3.6) and (3.7) as the following present values

$$(3.9) \qquad \lambda^K(t_o) = \int_{t_o}^{\infty} (1-\tau)\pi_K e^{-(\delta+\rho')t}dt$$

$$(3.10) \qquad \lambda^B(t_o) = \int_{t_o}^{\infty} \tau\bar{\delta}e^{-(\bar{\delta}+\rho')t}dt \equiv \tau Z$$

The equilibrium share price is characterized consequently by the condition (cf. (3.4)) $\partial\hat{V}/\partial\hat{K} + \partial\hat{V}/\partial\hat{B} = \hat{\lambda}^K + p_K\hat{\lambda}^B = p_K$. This is the asserted equality between the share values and the replacement values. Note that $0 < \lambda^B(t_o) < \tau$ from (3.10), which implies $\lambda^K(t_o) < 1$.

For convenience, set the origin t_o equal to 0. Using (3.6), (3.4) and (3.10) one obtains $(1-\tau)p\pi_K = p_K(\delta+\rho')(1-\tau Z)-\dot{\lambda}^K$. Differentiating (3.4) with respect to time, one finds $\dot{\lambda}^K = \dot{p}_K(1-\tau Z)$. Thus, in the financial regime we are studying, the gross required return on capital is given by

$$(3.11) \qquad \pi_K = \frac{p_K/p}{1-\tau}(\delta+\rho')(1-\tau Z)\left(1 - \frac{\dot{p}_K/p_K}{\delta+\rho'}\right).$$

This is the conventional result. It highlights the double taxation effect at the margin due to the joint impact of the corporation tax and the capital gains tax (through ρ'). Hence, the traditional types of the cost-of-capital formulas in the Nordic case are valid only under periods of new share issues. This is an important point for the investment studies. Note that to eliminate the effect of the corporation tax at the margin one needs $Z = 1$, which is what one expects to find.[8]

IV Final Remarks

Over the past years the Nordic corporation tax has been criticized on several grounds. The established wisdom seems to carry the message that the tax system allows the firms to postpone payment of their tax debts forever, that non-predetermined tax allowances create incentives for unwise investments with low marginal efficiency, and that both the depreciation allowances and the dividend deduction (the latter in Finland) erode the corporation tax base in an undesirable manner. Our results points to quite opposite conclusions. First, the tax

allowances do not provide an investment incentive at the margin.[9] Rather, apart from the temporary periods of new share issues, marginal investments are unaffected either by the allowable deduction or the corporation tax. Hence, no welfare losses are involved. Second, it is valid to claim that allowing tax debts to be carried forward is a feasible way to deal with the problem of an adjustment of the tax base for a premium due to capital risk. Third, the dividend deduction is not merely a workable way of eliminating the double taxation of dividends. As a by-product, it also lessens incentives for tax-based takeovers and avoidance of cash dividends. Thus, where is the problem? If one accepts the analysis of the current paper, one finds it legitimate to claim that two sources of problems can be identified. One is the tax-deductibility of the nominal interest on intramarginal debt. The other is the cash flow treatment of an expanding share of non-traditional investments with an immediate write-off while the traditional material investments are subject to income tax.Both these deductions are the basic reason for the erosion of the tax base. Thus the guide for the future tax policy is clear: increase the possibilities for immediate write-offs of all kinds of capital expenditures (including inventories) at an early stage of an asset's life and, at the same time, gradually limit the deductibility of interest on intramarginal debt.

Footnotes

1. For early references, cf. Brown (1948), Smith (1963), Sandmo (1974) and King (1975).

2. The well-known reason for the deviation of the share price from the replacement value of capital is due to the differentiated tax treatment of dividends and capital gains (cf. Bergström and Södersten (1977), Auerbach (1979), and Edwards and Keen (1983)). Intuitively, due to favourable tax treatment of appreciation of the firm's value, the shareholders are better off if a unit of potential dividend is allocated to finance a unit of capital even if the appreciation falls short of the gross dividens. Though it has not been stated in the literature, it is easy to see that the cash-flow corporation tax depresses share values in a similar way as the Nordic corporation tax.

3. Dividend tax relief was part of President Reagan's Treasury I and Treasury II proposals for the U.S. tax reform, but it did not pass. Finland is an example of a country which grants dividend tax relief.

4. The replacement investment is thus financed by a combination of undistributed profits and the tax shields provided by the depreciation and the dividend relief, i.e.

$$\delta p_K \hat{K} = (1-\tau)p\pi(\hat{K}) - \hat{D} + \tau(\hat{\delta}^*\hat{B} + \gamma\hat{D}).$$

5. The justification for accepting that this is indeed the case is not given here because it has been rigorously proved in an earlier paper by the author (1986). Intuitively, it is shown there that a firm which has previously used up its potential for tax allowances i.e. which currently has a "low" B(t)-value but which still faces profitable investment opportunities will expand its B(t)-value along with the expansion of capital. This means that before it adopts the equilibrium policy, its current rate of investment will exceed its currency claimed tax allowances along the optimal dynamic path.

6. Assuming that the associated transversality conditions hold, these conditions are sufficient, too, since the maximized H_1-function is concave in the state variables.

7. If the firm follows the equilibrium policy from the point $s \geq t_1$ on, its value is given by $V(s) = e^{-\rho' s}(1-\theta)\hat{D}/(1-c)$, where $\hat{D} = \omega[p\pi(\hat{K}) - p_K\delta\hat{K}]$ is the stream of the steady-state dividends. Hence, $\hat{\lambda}^B = \partial V(s)/\partial\hat{B}(s) = 0$.

8. As a final comment on this section, it should be mentioned that a switch from the equity policy with new share issues to a regime where the firm refrains from issuing shares brings along a decline in the required return on investment. Hence, there exists a transitory period over which the firm has incentives to grow. It is not studied here because it has been analyzed thoroughly in a truly dynamic framework by the author (1986).

9. The paper thus shares the view proposed by Bergström and Södersten (1984).

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