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by Christian Keuschnigg

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Special Reports

Company Taxation and Growth: The Role Of Small and Large Firms

by Christian Keuschnigg

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Human capital formation, technological innovation, and accumulation of physical capital are the engines of growth that ultimately determine a country's income per capita. Human capital formation is presumably the most important driver of growth as the returns to technological innovation and physical investment tend to be higher in a country endowed with a better-educated workforce. In that sense, innovation and capital accumulation are largely induced by human capital investments. In most countries, taxes are probably not an important impediment to skill formation. The most important private cost of education is forgone wages, net of the wage tax. The returns to education accrue in terms of future wage increases and are subject to wage taxation. A proportional wage tax would thus lower the cost of education today by the same factor as it reduces the wage gains in the future.

The government thus shares in the costs and returns to education proportionately, making taxes largely neutral in education decisions. Tax progression will impair education incentives because a progressive tax takes a larger share in higher future wages while it subsidizes only a relatively smaller share of education costs in terms of forgone wages today.[1] Other costs of education are largely free. In most developed countries, public schools and even universities are free, which corresponds to a large subsidy on the real cost of education and skill formation.

Matters are different for capital accumulation and innovation when the returns to investment accrue as capital income in one form or the other. Taxes tend to distort those decisions in many respects. As a consequence, capital income taxes not only tend to suppress the level of capital accumulation, but also impair the efficiency in the allocation of capital across competing uses. Capital income taxes on the company and personal level push a wedge between the pretax rate of return that firms must earn before taxes and the net tax rate of return that investors receive after taxes. In reducing net

[1]See Keuschnigg (2005) for a simple and illustrative analysis.

returns, taxes discourage savings and the supply of capital by investors, and in raising gross returns, they impair investment and the demand for capital by firms.[2] Depending on which effect is stronger, taxes may contribute as well to a country's net foreign assets or debt. In addition to those level effects, taxes distort the allocation of savings and investment across different uses and thus result in a further growth-retarding efficiency loss.

Taxes discourage savings and the supply of capital by investors and impair investment and the demand for capital by firms.

The impact of taxes on the level of savings and investment and on efficiency in the allocation of capital is the theme of this essay. Section I discusses a number of efficiency and equity problems of comprehensive income taxation. Section II reviews the most important behavioral margins that determine the impact of taxes on growth. A particular focus is on the differential effects of taxes on different types of firms, such as small and large firms and home-owned and multinational companies. The discussion also shows what is required to ensure tax neutrality on various margins.

Section III proposes a growth-oriented version of a dual income tax, the Swiss Dual Income Tax (SDIT) system proposed by Keuschnigg (2004). That fundamental tax reform is designed to achieve a substantial impact on growth by eliminating tax barriers to investment and innovation, strengthening the attractiveness for the location of international investment, and ensuring tax neutrality in as many margins as possible. Section IV evaluates the short- and long-run quantitative effect of the reform. Section V discusses how the tax system affects start-up investment and how tax reform could improve the quality and quantity of venture capital financing of young firms. Section VI concludes.

I. Problems of Income Taxation

In most countries, income taxation follows the traditional Schanz-Haig-Simons model of a comprehensive income tax, which subjects all types of income to the same tax rate. Taxable income is broadly defined and should include all increases in wealth that accrue from the beginning to the end of a period. Fairness requires that the income tax fulfill the principles of horizontal and vertical equity. Horizontal equity means that different people with the same income, or increase in wealth, should pay the same tax.

Vertical equity is associated with the ability to pay principle, requiring that people with more income pay more tax. How much more tax they should pay remains largely in the realm of philosophical judgment, rather than purely economic reasoning. It is often claimed that vertical equity requires a progressive tax schedule, although that is by no means a necessary implication of the ability to pay principle. Most countries have indeed implemented a progressive income tax. In practice, the income tax is riddled with important loopholes and elements of double taxation at the same time. That is particularly true in the taxation of capital income as part of the income tax.

Capital income earned by corporate firms gets taxed as corporate income tax at the company level and different forms of personal income taxes. At the personal level of the investor, capital income is usually taxed at differential rates, depending on whether capital income accrues in the form of interest, dividends, or capital gains. Many countries, including Austria, have departed from the comprehensive personal income tax, which taxes all forms of income at the same tax rates. Instead, countries increasingly apply separate, proportional tax rates on personal capital income while labor income remains subject to the progressive income tax schedule. In an important economic sense, even the comprehensive personal income tax subjects different types of capital income to different effective tax rates, despite applying the same statutory tax rate. According to the realization principle, capital gains remain untaxed during the entire holding period until they are realized. The interest gains on taxes that are postponed until realization result in a considerably lower effective tax burden as compared with income that gets continuously taxed upon accrual.

Another important aspect of unequal taxation of labor and capital income under the comprehensive income tax results from inflation and because tax rates are applied to nominal rather than real income. Even at a low inflation rate, a given tax rate applied to nominal capital income means a much higher effective tax rate on real capital income and thereby raises the effective tax rate on capital income over that on wages. That problem is important even for a low inflation rate. Suppose the nominal interest rate is 4 percent and the inflation rate is 1 percent, implying a real interest of 3 percent before tax. If a 25 percent tax on interest is levied, the nominal and real interest rates net of tax are 3 percent and 2 percent, respectively. In real terms, interest is 3 percent before tax and 2 percent after

[2]The effects of capital income taxes at the firm and personal level were analyzed in much detail in Sinn (1987, 1991). Auerbach (2002) reviews the recent literature.

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tax, giving a tax wedge of 1 percentage point. The effective tax rate on real interest, defined by the tax wedge as a share of the real pretax return, is 33 percent, 8 percentage points higher than the nominal tax rate of 25 percent!

Taking an intertemporal perspective reveals another equity problem with interest taxation, and capital income taxation more broadly. One of the principles of income taxation is that the tax liability should depend only on income, and not how that income is used. It is, and should be, irrelevant for the income tax liability whether income is spent on cars, clothes, or any other useful consumption goods. The comprehensive income tax discriminates, however, in one important way between alternative uses of income — consumption of income today or in the future. Consider two workers with the same income, subject to the same top tax rate of 50 percent. Suppose they have gross income of €20,000, or €10,000 net of tax, available either for consumption right now or 10 years in the future. The spendthrift spends and consumes immediately. No further income tax is due. The income tax reduces her consumption by 50 percent, from €20,000 to €10,000. The other worker, who is more of a saver, puts aside €10,000 out of her taxed income and consumes it only 10 years later. With an interest rate of 4 percent gross of tax and 2 percent after tax (with a 50 percent tax rate), savings before tax would be worth €20,000 x 1.04^{10} = €29,600 and only €10,000 x 1.02^{10} = €12,200 after tax. Her consumption in 10 years gets reduced by (29,600-12,200)/29,600 or 58 percent, compared with 50 percent for the spendthrift.

The reason for that much higher tax burden on the saver is the taxation of interest income, which amounts to double taxation of saved wages. Savings were already taxed by 50 percent when they were set aside. Even though the spendthrift and the saver are exactly the same in terms of their current income, the saver is punished by a much higher tax rate simply because she chose to use her income 10 years later than the spendthrift. That discrimination is exacerbated by the progressive nature of the income tax. It is alleviated in countries that apply a separate, lower tax rate on personal capital income. Proponents of a consumption-based tax system argue that the double taxation of savings should be eliminated completely. That could be done by applying a zero tax rate on interest income, or by deducting new savings from the personal income tax base.

In fact, many countries have partly done that. Apart from the general savings deduction meant to keep small amounts of savings tax-free, individual contributions to funded pension plans and life insurance schemes, as well as savings for owner-occupied housing, are often tax-deductible up to a limit. Those tax incentives for some types of savings mean that a considerable part of aggregate savings already gets consumption tax treatment. Double taxation of savings is eliminated if savings today are tax-deductible while future returns, such as pension payments from funded pension plans, are subject to the income tax. Savings are taxed once. With owner-occupied housing, however, not only savings today, but also future returns, are tax-favored because the imputed income from living in one's own house is often not taxable.[3] That tax treatment more than eliminates double taxation, but results in an outright tax loophole.

The comprehensive income tax discriminates between alternative uses of income — consumption of income today or in the future.

Another form of double taxation of capital income is the wealth tax. The wealth tax is, in fact, equivalent to an income tax on the normal return on capital. Suppose an asset generates a normal return of 4 percent gross of tax and the maximum rate of the wealth tax is 0.7 percent, as in Switzerland. Subtracting the wealth tax leaves a private return of only 3.3 percent. The tax wedge of 0.7 percent as a share of the pretax return amounts to 17.5 percent. The wealth tax of 0.7 percent is equivalent to an interest tax of 17.5 percent because both lead to the same net tax return. The wealth tax thus leads to substantial double taxation because it comes on top of other taxes on capital income. The wealth tax is, however, even more problematic than normal capital income taxation because it must also be paid in periods when the asset generates only a low or even no return at all. In a less prosperous period, the asset may generate a return of only 1 percent and the government takes 70 percent of that return by imposing the wealth tax. If there is no return at all, the wealth tax effectively confiscates part of the asset. The wealth tax substantially raises the downside risk of asset income.

The ideal of comprehensive income taxation is further eroded in reality, leading to even more cases of differential taxation of capital income. Entrepreneurial income from small noncorporate firms is taxed once as part of the entrepreneur's personal income tax. Income derived from corporate equity

[3]In Switzerland, savings for owner-occupied housing are tax-deductible only to a very minor extent, while the imputed value of rental income is subject to the income tax. Also, interest from credit financing of housing can be deducted. Hence, residential savings get double taxed if they are not financed with credit. That tax treatment may partly explain the low share of owner-occupied housing and the high fraction of credit financing of residential investment in Switzerland.

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ownership is often double taxed, first by the corporate tax at the firm level and then at the personal level by dividend and capital gains taxation. Full tax relief from double taxation by means of complete integration of the corporate tax is the exception rather than the rule. If investors hold corporate debt instead of equity, interest on corporate debt is taxed only once at the personal level because interest is tax-deductible at the company level. Compared with holding debt, corporate equity gets taxed twice when tax integration is incomplete.

To sum up, the practice of income taxation deviates substantially from the ideal of a comprehensive income tax. Some parts of capital income get taxed twice and at a much higher rate than labor income, while other parts essentially go tax-free. That practice not only violates horizontal equity as a basic principle of fair taxation, it also imposes considerable efficiency costs on the economy, leading to lower income and growth than would be possible with a more efficient tax system. Taxes not only distort the level but importantly also the allocation of savings and investment toward alternative uses. More neutrality in the taxation of alternative forms of capital income can probably generate substantial efficiency gains.

II. Taxes and the Level and Efficiency Of Capital Accumulation

A. Extensive and Intensive Investment

The effect of taxes on investment is probably the most important channel on how taxes can affect the level and growth of income per capita. Investment, however, can occur in many different forms and is managed by different types of firms. The effect of taxes matters in different ways for different types of investment. A key distinction is between extensive and intensive investment. Investment on the extensive margin refers to discrete, lumpy investment decisions, such as the location choice of multinational firms or the start-up decision of new entrepreneurs. Extensive investment reflects a comparison among discrete alternatives, such as allocating a new plant to one or the other country or the career choice of starting one's own firm versus remaining employed in established firms. The average effective tax rate (AETR), that is, the share of total taxes paid as a fraction of profits, matters for the location decision for subsidiaries of multinational companies or for the location of internationally mobile firms. The AETR is dominated by the size of the statutory rates. The rate of new business creation depends on the career choice of potential entrepreneurs. The tax effect depends on the comparison of the AETR to the two alternative occupations, that is, on the relative average tax burden on labor and entrepreneurial capital income.

Multinational companies often belong to the most technologically advanced firms. New entrepreneurial firms are considered to be more innovative and to have more profitable investment opportunities compared with large established companies. The AETR, and thus the size of statutory tax rates, matters for important parts of aggregate investment and innovation. The size of the statutory tax rate also matters for profit shifting of multinational firms, which might importantly erode the corporate tax base in high-tax countries. The larger the difference is in the absolute tax rates of a high- and low-tax country, the stronger the incentives are for multinational firms to shift profits away from high-tax to low-tax countries. Companies may do so, for example, by manipulating transfer prices. The importance of discrete investment decisions and of profit shifting explains why the magnitude of statutory as compared with marginal tax rates plays such an important role in the policy discussion.

Investment on the intensive margin refers to expansion investments of established firms, which may grow larger by investing more in plant and equipment, or neglect investment to shrink in size. The profitability of marginal investment projects depends on the effective marginal tax rate (EMTR), which importantly depends on the extent of depreciation allowances, investment premiums, and other investment-related deductions from the tax base. For example, the EMTR may be zero despite a large statutory tax rate if new investment expenditure is fully deductible from taxable profits. The intensive investment margin refers to the variable investments of established firms. The EMTR is thus the classical measure for tax barriers to investment.[4]

In the aggregate, both personal and company level taxes determine the total tax wedge between a company's pretax rate of return and the required net of tax return to investors. However, different taxes play very different roles for different types of firms. Obviously, corporate taxes are not directly relevant

[4]Sorensen (2004) contains a number of contributions on the measurement of effective marginal and average tax rates. European Commission (2001) reports extensive comparisons of marginal and average rates across EU member states. Devereux and Griffith (1998) have shown empirically that direct multinational investment depends more on average rather than marginal effective tax rates. De Mooij and Ederveen (2003) provide a survey of empirical estimates and find that direct investment is around two times more tax-sensitive than marginal domestic investment. Hasset and Hubbard (2002) review the estimates on intensive investment and report an elasticity of about -1. A tax-induced reduction of the user cost by 1 percent would boost the capital stock by 1 percent in the long run. Rosen (2005) and Cullen and Gordon (2002) show empirically that taxes significantly affect start-up entrepreneurship and entrepreneurial activity.

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for small noncorporate firms, which are, in fact, responsible for a substantial part of aggregate employment.[5] More surprisingly, personal taxes on dividends and capital gains are not necessarily relevant for investment of corporate firms. That very much depends on the ownership structure of corporate firms. Small, closely held corporations, such as family firms, are entirely home-owned and have to take into account the domestic investors' personal taxes. Multinational companies and large domestic corporations listed on stock markets may be owned by foreigners or domestic institutional investors, such as pension funds (important in Switzerland) that are not subject to domestic personal taxation. The larger the ownership share of those tax-free investors, the less significant the potential effect of personal taxes on the companies' cost of capital.

How broad is the effect of tax reform on investment? Unfortunately, numbers are scarce. I am not aware of any readily available data or empirical work that would break down domestic employment in noncorporate firms, domestically owned, listed and nonlisted corporations, and multinational corporations. Taking Switzerland as an example, a rough estimate is that about 30 percent of the workforce is employed in noncorporate firms and, in the absence of any other guideline, one may think that 30 percent of the aggregate capital stock is managed by noncorporate firms. That would imply that large firms are simply scaled-up versions of small firms, with no systematic difference in capital labor ratios. A cut in the corporate tax obviously provides no tax relief to noncorporate firms and is thus relevant for about 70 percent of aggregate investment.

Being a source tax, the corporate tax reaches all corporate firms with domestic operations, irrespective of whether they belong to domestic corporations or domestic or foreign multinationals. The personal income tax is relevant only for noncorporate entrepreneurial firms, creating about 30 percent of aggregate employment. Dividend and capital gains taxes take from the income of corporate ownership at the personal level. Note, however, that a significant part of corporate shares are owned by foreign private and institutional investors, or domestic institutional investors, that are not subject to domestic personal taxes. One can safely assume that dividend and capital gains taxes are relevant only for part of aggregate investment in the corporate sector. They should matter most for family firms with concentrated domestic ownership.

There is a debate about whether dividend taxes are able to affect investment (see Zodrow (1991), for example). The "old view" assumes that firms follow a well-determined dividend policy and thus must finance investment at the margin with both retained earnings and new equity. The dividend tax then reduces investment. The "new view" claims instead that investment is largely financed by retained earnings at the margin, with dividends being the residual use of profits. The dividend tax is then irrelevant for investment. Note, however, that even staunch supporters of the new view concede that the dividend tax depresses the start-up investment of new firms (see Sinn (1991), for example). It is probably more useful to distinguish small growth firms that tend to be financially constrained and need external equity capital, and large mature firms with large free cash flow that can easily finance marginal investment with retained earnings. The empirical analyses of Auerbach and Hassett (2003) and Dietz (2005) point in that direction and imply that dividend taxes reduce investment by smaller firms, but are not particularly important for large corporations.

The wealth tax leads to substantial double taxation because it comes on top of other taxes on capital income.

International tax competition reflects the countries' desire to attract physical and portfolio capital to generate more labor and capital income at home and to protect the domestic tax base needed to finance the public sector. How should countries adjust their tax system to advance national welfare in the face of intensive tax competition and high capital mobility? Roughly speaking, personal taxes matter for international portfolio investment. Company taxes, and most importantly the corporate tax, are relevant for the location and level of physical investment, which is a precondition for high wages and employment.[6] It seems more important for a country's welfare to reduce those source taxes on physical investment to strengthen the attractiveness of the domestic economy as a location of international investment. In boosting capital formation, a reduction of those taxes must eventually also benefit domestic workers and will ultimately have a broad beneficial impact on the home economy.

The optimal taxation literature in theoretical public finance suggests that a country should reduce source taxes, that is, the corporate tax, to zero while taxing domestic savings and portfolio capital at a

[5]In Switzerland, roughly 30 percent of total employment; *see* Keuschnigg and Dietz (2003).

[6]See Devereux (2000) for an overview of the literature and a stylized analysis.

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positive rate. The predictions on the zero corporate tax rate are reflected in the prolonged downward trend in corporate tax rates by international comparison. The optimal size of that personal tax rate on savings depends on the magnitude of the savings elasticity relative to the labor supply elasticity.[7] Furthermore, low interest and dividend taxes help to attract portfolio investment and generate employment in the domestic financial sector. A high international mobility of portfolio capital thus limits a country's ability and desire to levy high personal taxes on savings.

The practice of income taxation deviates substantially from the ideal of a comprehensive income tax.

The result of a zero source tax does not necessarily mean that the statutory corporate tax rate should be zero. A positive statutory rate is called for to tax economic rents and the returns of location-specific fixed factors, which can be taxed without efficiency costs and thereby contribute valuable tax revenue. The corporate tax rate also serves as a backstop for the taxation of income that is difficult to reach at the personal level. The zero tax result only suggests a zero EMTR, which essentially leaves a normal rate of return to capital tax-free. A zero EMTR is achieved either by allowing for immediate investment expensing (cash flow tax)[8] or by deducting all costs of finance, including an imputed return on equity (allowance for cost of equity, or ACE). Both methods of reducing the EMTR to zero would also substantially reduce the AETR and thereby strengthen a country's attractiveness for international investments, because only supernormal returns would get effectively taxed while a normal return would remain tax-free.

B. Financial Decisions of Firms

Firms may finance new investment with either debt or equity. Corporate firms can raise equity finance either from internal self-financing via retained profits or by issuing new shares. The debt equity choice determines the firm's leverage and vulnerability on negative profit shocks. If taxes favor debt over equity, they contribute to high financial leverage resulting in a larger aggregate rate of business failure during recessions. Taxes do influence the firm's debt equity choice in important ways. At the firm level, interest on debt-financed investment is tax-deductible, while the cost of equity is not. The tax advantage of debt increases with the size of the profit tax rate.[9] The tax advantage of debt is partly offset by taxation on the personal level if interest on directly held business debt is taxed more heavily than the return to equity in terms of dividends and capital gains. Capital gains are almost universally taxed on realization rather than accrual. Accrued capital gains remain tax-free until the asset is sold and the capital gain is realized (realization principle). During the holding period, the investor essentially receives an interest-free credit on postponed taxes, which greatly reduces the effective, accruals equivalent capital gains tax rate. In many cases, capital gains remain entirely tax-free and the dividend tax rate is reduced as a means of integrating corporate and personal taxes to avoid double taxation.

As a result of the realization principle, dividends are taxed much more heavily at the personal level than capital gains. That tax disadvantage of dividend payments favors equity financing by retained earnings compared with dividend payments combined with new share financing of investment. On the positive side, that strengthens the firm's equity base and helps to offset the tax advantage of debt at the firm level. On the negative side, however, the tax penalty on dividend payouts makes it profitable to retain profits and finance investment internally even if much more profitable investment opportunities are available outside the firm. Thereby, the tax system favors investment in large mature firms that have large profits relative to their own investment opportunities and tend to invest less profitably than young, fast-growing companies.

Young growth companies belong to the most dynamic firms and are particularly important for innovation and growth in the aggregate economy. Those fast-growing firms have more profitable investment opportunities than they can finance out of their own profits and necessarily require external debt as well as risk capital. The tax penalty on dividends, however, discourages dividend distributions and thereby hinders the capital market in allocating scarce investment funds to their most profitable uses. There is much empirical evidence

[7]See Keuschnigg (2005) for a simple statement and Gordon (2000) for a review of the literature. Devereux, Griffith, and Klemm (2002) document the international downward trend in the corporate tax.

[8]With a cash flow tax, tax deductibility of interest must be eliminated to prevent a subsidy on debt-financed investment. That would create difficult transitional problems.

[9]*E.g.*, Gordon and Lee (2001) estimate that a reduction of the corporate tax rate by 10 percentage points would reduce the debt asset ratio by 3 percent to 4 percent.

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that the dividend tax penalty reduces dividend payouts,[10] which are a precondition to make profits available for reinvestment in other firms. It is also well established that large mature firms on average tend to invest less profitably than young growth companies. Hence, the tax preference for retained earnings stands in the way of efficient capital allocation.

One can further argue with good reason that the tax preference for retained profits stands in the way of good corporate governance. The existence of large free cash flow within big firms allows management to divert resources and pursue nonvalue maximizing investment strategies to enhance their own personal interests. The need to raise external capital reduces the scope for those inefficient management activities because new external financing usually comes together with monitoring and an assessment of the firm's prospects. The tax system exacerbates the inefficiency of free cash flow because investors, for tax reasons, tend to demand less dividends and prefer instead capital gains from internally financed investments. One may thus expect that more tax neutrality on dividend distributions versus profit retentions would strengthen the investors' position against management and thereby improve the quality of corporate governance.

C. Organizational Form and Entrepreneurship

Taxes affect the efficiency of capital allocation also by their effect on the firms' choice of organizational form. Profits of noncorporate firms are taxed only once. They are part of the entrepreneur's personal income and thereby subject to the income tax. Insofar as corporate tax integration is incomplete, corporate profits are double taxed. That tax disadvantage discourages the firm's decision to incorporate even though it might be advised for economic reasons such as limited liability, improved access to capital, and so forth. Those advantages of the corporate form become more important once the firm expects to grow beyond a particular size. The (partial) double taxation of corporate profits prevents some firms from incorporating even though they could grow larger and earn higher profits by transforming into a corporation. Taxes thus can distort the allocation of capital between corporate and noncorporate sectors. The efficiency cost is not to be ignored, as recent empirical literature shows.[11]

Finally, taxes can discourage risk-taking and start-up entrepreneurship. A proportional income tax may actually encourage risk-taking if it is combined with full loss offset. When the government shares proportionately in profits as well as losses, it provides via the tax transfer system a welcome insurance effect that is often not possible on the private capital market. In that case, taxes actually encourage the pursuit of risky activities such as investing in risk capital for new firms or pursuing a risky entrepreneurial career. Most tax systems, however, limit the extent of loss offset or loss carryforward and thereby discourage risk-taking.

That insurance effect might be particularly important for small and medium-size firms with a dominating entrepreneur who is not sufficiently diversified but has concentrated her wealth mostly in her own firm.[12] Apart from that welcome insurance effect, entry into entrepreneurship and the rate of business creation depend on the relative magnitude of the average tax burden on profit and labor income, the two alternatives of that career choice.[13] The higher the total tax burden from corporate and personal taxes that falls on profit income relative to wage income is, the less attractive it is to give up employment for an entrepreneurial career.

III. A Dual Income Tax for More Tax Neutrality and Growth

Income taxation in practice is not only riddled with preferential tax treatments for particular types of income and even complete exemptions, but comes with elements of double taxation as well. Those features plainly violate the principle of horizontal equity for fair taxation, and they also give rise to important efficiency costs. The ideal of comprehensive income taxation is far from achieved. From a theoretical viewpoint, the fundamental goals of public policy, efficiency, and redistribution conflict with each other. Rational tax policy must find an optimal trade-off between efficiency and redistribution, which does not imply that all types of income should be taxed at the same rate.

Instead, if capital income responds with a much higher elasticity to taxes compared with labor income, capital income should be taxed at a lower effective rate. In a globalized economy, capital is much more internationally mobile than labor, which raises the elasticity of the tax base. That development has put strong downward pressure on corporate and personal tax rates, which would otherwise

[10]According to Poterba (2004), taxes significantly and quite strongly reduce dividend payouts.

[11]MacKie-Mason and Gordon (1997) estimate the deadweight loss from the tax distortion of organizational form amounts to 16 percent of the sum of the tax payments of corporate and noncorporate firms.

[12]See Keuschnigg and Nielsen (2004a) and Cullen and Gordon (2002) on taxes, entrepreneurship, and risk-taking.

[13]See Keuschnigg and Nielsen (2004b) for a formal analysis.

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drive direct and portfolio investments out of the country. Many open countries have thus strongly cut corporate taxes and have proceeded to tax personal capital income at low, proportional rates separate from the progressive income tax schedule.

How broad is the effect of tax reform on investment? Unfortunately, numbers are scarce.

In Keuschnigg (2004), I have worked out the elements of a fundamental tax reform for Switzerland consisting of a growth-oriented version of a dual income tax.[14] The SDIT system consists of the following elements:

- progressive wage taxation with a top marginal rate of 37 percent;
- proportional profit tax at a flat tax rate equal to the current average rate of 23 percent that applies uniformly to all firms, corporate and noncorporate;
- deduction of a normal rate of return on equity, equal to a long-run average of the risk-free return on government bonds; and
- a proportional "shareholder" tax at the personal level on all types of capital income (interest, dividends, and realized capital gains) at a rate of 18 percent. A surcharge on realized capital gains is levied to compensate for interest gains due to tax deferral during the holding period. The tax allows for full loss offset.

The SDIT system shares with any other form of dual income taxation the characteristic that labor income is subject to a progressive tax schedule while capital income is taxed separately at a moderate, proportional rate. As Table 1 shows, the SDIT system departs quite substantially from the current Swiss tax system. It is meant as a long-run guideline for tax policy aiming at tax neutrality to the fullest possible extent, rather than a compromise reform that is constrained by the status quo and the need to appeal to diverse interest groups for maximal political support. As a first element, SDIT subjects all firms, corporate and noncorporate, to the same profit tax, while at the personal level a flat tax rate of 18 percent is applied to all income received from the firm.

Currently, entrepreneurs with noncorporate (NC) firms are subject to the personal income tax, which amounts to 37 percent on average in the top income bracket, including all layers of government, with considerable variations across different locations in Switzerland. Also, capital gains from sale of the firm, and so forth, are fully subject to the income tax, which amounts to an effective accruals equivalent rate of 15 percent on realized capital gains after discounting for the interest gains during the holding period. Under SDIT, the entrepreneur would first pay the profit tax of 23 percent, after allowing for an imputed cost of equity and interest on debt. He would further pay a shareholder tax of 18 percent whenever he pays out a profit or realizes a capital gain. In receiving exactly the same tax treatment as corporate firms (domestic corporations, or DC), the system is neutral by construction for organizational choice.

With corporate firms, SDIT introduces a new allowance for corporate equity (ACE) at the firm level, thereby extending the tax deductibility of interest on debt to the opportunity cost of equity financing as well. At the personal level, shareholders will receive a tax cut on dividends. Up to now, dividends are fully subject to the personal income tax in Switzerland, with no dividend tax relief whatsoever. Switzerland is one of the few countries where dividends are subject to full double taxation. Under SDIT, the shareholder tax applies, which is about half the current top income tax rate. On the other hand, capital gains on privately held shares are, in principle, tax-free with a number of exceptions when the normal income tax applies. Taking account of those exceptions, the effective capital gains tax rate on personally held shares is only about 4.3 percent. SDIT closes that tax loophole and subjects those capital gains to exactly the same effective tax rate of 18 percent under the shareholder tax that applies to any other form of personal capital income as well.

Chart 1 illustrates how the implementation of SDIT would reduce EMTRs on investment by domestic corporate and noncorporate firms, separately for each mode of finance. The EMTRs are uniform across sectors and modes of finance, which illustrates the attractive neutrality properties of SDIT. Any remaining small differences are due to slight differences on risk premia on equity and debt rather than tax differentials. The height of the bars shrinks

[14]The study was commissioned by Avenir Suisse. The full text of the report in German is available on the Internet at http://www.iff.unisg.ch. Keuschnigg and Dietz (2004) contains a more formal analysis of the proposal. The dual income tax (DIT) was favored early on by Sorensen (1994). It was suggested by Cnossen (1999) as a model for the European Union. Nielsen and Sorensen (1997) discussed the optimality of a dual income tax. Gordon (2000) discusses many conceptual issues that are also related to the DIT. Recently, a version of the DIT was suggested by the *Sachverständigenrat* (2003) for Germany, which originated a discussion in Germany, *e.g.*, Boadway (2004) and other contributions in the same issue of CESifo Dice Reports, and Eggert and Genser (2005). None of those proposals combined an allowance for corporate equity with dual taxation at the personal level.

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Table 1.
Tax Rates: Status Quo vs. Swiss Dual Income Tax (SDIT)

Tax on	Status Quo		SDIT	
	Domestic Corporations	Noncorporate Firms	Domestic Corporations	Noncorporate Firms
Profits	23.2%	37.33%	23.2%	23.2%
Allowance for Equity	no	no	yes	yes
Capital Gains	4.3%	15.3%	18.4%	18.4%
Dividends	37.3%	—	18.4%	18.4%
Interest	37.3%	37.3%	18.4%	18.4%
Wages	37.3%	37.3%	37.3%	37.3%
Value Added	7.6%	7.6%	—	—
Property	0.7%	0.7%	0.7%	0.7%

Source: Keuschnigg (2004) and Keuschnigg and Dietz (2005).

substantially, which reflects the broad-based investment stimulus to be expected. The remaining height of the bars shows the continued taxation of capital income at the personal level on account of the shareholder tax and the wealth tax. One must finally appreciate that the fully uniform tax treatment of different types of personal capital income is a major improvement in terms of horizontal equity over the current Swiss tax system.

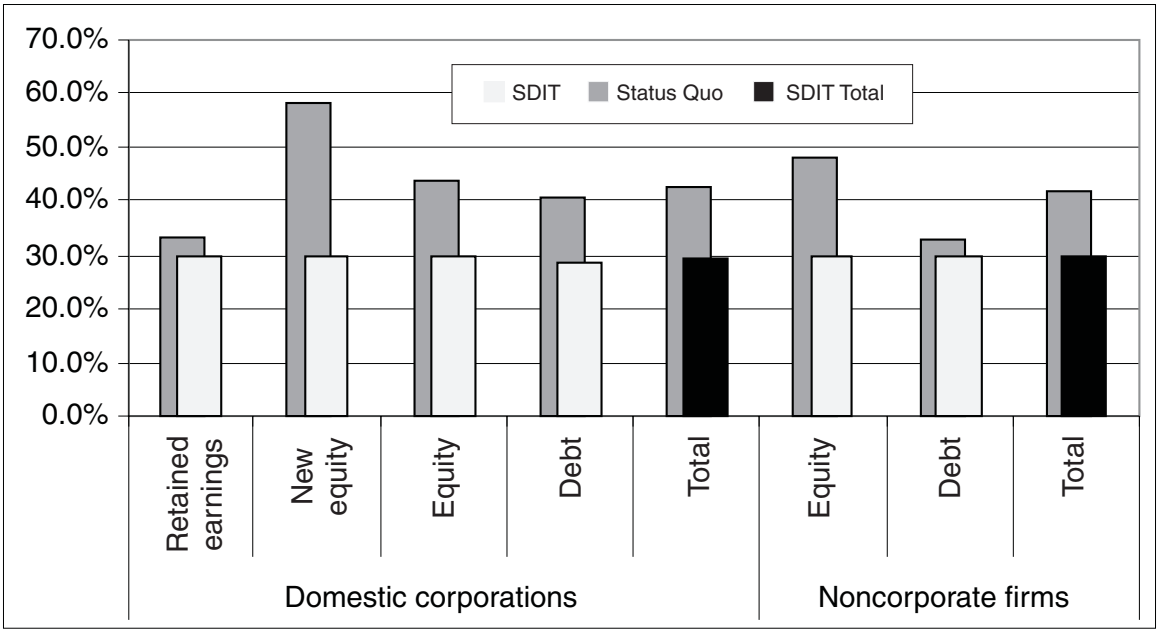
From a growth perspective, the deduction of an imputed cost of equity (ACE) is the most important feature of SDIT. A normal return on capital thus remains tax-free at the level of the firm. It is taxed exclusively at the personal level with a moderate, proportional rate. Only supernormal profits in excess of the normal return, such as rents on fixed factors or monopolistic profits, are effectively taxed by the profit tax. Those excess profits can be taxed without damaging the prospects of marginal investments. The ACE allowance thus reduces the EMTR to zero at the firm level and provides a big stimulus to the variable investments of established firms with operations at home. On the other hand, it reduces the profit tax on a normal return to capital to zero and, thus, substantially reduces also the AETR of firms. Because direct investment by multinational firms depends primarily on the AETR, the ACE deduction is also a decisive element to strengthen the attractiveness of home country as a location of international investment.

The SDIT is neutral to financial behavior of firms. It eliminates the tax discrimination of equity capital at the firm level because it allows all costs of finance, interest on debt, and imputed interest on equity to be deducted from the profit tax. At the personal level, the shareholder tax includes all forms of capital income symmetrically, irrespective of whether it is received as interest, dividends, or capital gains. The tax advantage of capital gains on account of the realization principle is offset by a surcharge on the interest gains due to tax postponement during the holding period. Hence, the system treats debt and equity financing entirely symmetrically and eliminates any existing distortion to debt equity choice. It also eliminates the tax penalty on corporate distributions and thereby avoids the tax discrimination of young growth companies. Those firms do not have sufficient free cash flow to finance their expansion purely from retained profits, but rather need new risk capital to finance further growth.

In eliminating the tax penalty on dividends, SDIT encourages increased dividend payments and facilitates the allocation of scarce investment funds to those firms with the most profitable investment opportunities and the highest growth potential, rather than locking capital into large firms with only moderate returns to investment. The flat tax rate on personal capital income combined with full loss offset strengthens the tax system's role in encouraging entrepreneurial risk-taking as it makes government share in success and failure of risky investments proportionately.

Under SDIT, the shareholder tax comes on top of the wealth tax, which can be viewed as an additional, presumptive capital income tax. Both taxes add up to an effective tax on capital income, which is by now exceptionally low by international standards

Chart 1. Effective Marginal Tax Rates: Status Quo vs. SDIT



Source: Keuschnigg (2004) and Keuschnigg and Dietz (2005).

even though it implies a substantial reduction in capital income taxes in Switzerland. The shareholder tax is no more than half of the current tax on dividends, and capital gains if they are taxed at all. That raises the question of whether SDIT suffers from the same problem of labor tax avoidance as most existing variants of dual income taxation. Sole proprietors and entrepreneurs might want to declare high-taxed labor income as low-taxed capital income, which would erode the labor tax base and lose significant parts of tax revenue. Note, however, that any profit in excess of a normal return to capital is subject to the cumulative burden of the shareholder and profit taxes, which adds up to the top tax rate on labor income. For that reason, tax arbitrage doesn't pay under SDIT.

Suppose a person earns labor income from her personal activities and gets taxed at the top personal tax rate of 37 percent. To save taxes, she decides to establish her own firm, and does not pay herself any salary but receives her income as profits. Those profits do not reflect the return on assets, but result from labor inputs. Because there is no ACE allowance available in that case, those profits appear as supernormal profits that are fully subject to the profit tax at a rate of 23 percent and to the personal shareholder tax at a rate of 18 percent. Because the tax rates under SDIT satisfy the condition (1-0.18) x (1-0.23) = (1-0.37), the cumulative tax burden is equal to the top rate of the progressive wage tax. Tax arbitrage doesn't pay with SDIT.

IV. Quantitative Effect of Tax Reform

The potential short- and long-run effects of implementing the SDIT system were calculated with a computational growth model for Switzerland. The model takes account of investment, financing, and savings decisions of households and firms and differentiates between noncorporate, domestically owned corporate firms, as well as domestic and foreign multinational firms with their operations in Switzerland. Depending on the form of revenue compensation (either an increase in the VAT or a cut in transfer expenditure),[15] the long-run level effects of GDP range between 2.5 percent and 3.5 percent. After completing the transitional adjustment period required to attain the new growth path, GDP would

[15]The two scenarios were motivated by two considerations. First, the normal rate of VAT is only 7.6 percent in Switzerland and is extremely low by international comparison. Second, social spending has grown vigorously in the last decade.

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permanently exceed the levels pertaining to the growth path without tax reform by 2.5 percent to 3.5 percent. The reader is referred to the full report in Keuschnigg (2004) and the more formal analysis in Keuschnigg and Dietz (2005) for more detailed documentation of the quantitative results.

At first sight, the magnitude of those GDP gains may appear moderate, given the extent of the reform. Partly, they reflect two aspects rather specific to the Swiss situation. First, the revenue losses are substantial in the short-run because interest and dividends are fully subject to the income tax in Switzerland, while other countries, such as Austria or the Nordic countries, have already introduced a lower final tax on those types of income. Financing those revenue losses reduces the growth effects of the tax reform. Second, capital gains on privately held shares are tax-free in Switzerland, although there are numerous exceptions to this principle that mainly contribute to substantial tax uncertainty. The SDIT system, however, requires equal effective taxation of capital gains not only for reasons of horizontal equity but also for efficiency reasons. The increase in capital gains tax also retards the growth effects of the reform.

There is no tax reform without redistribution. The implementation of SDIT would also involve redistributive effects to a considerable extent. They do depend, however, on the specific situation before the reform. If a reform removes the multiple and cumulative taxation of some types of capital income, a correction of that multiple taxation necessarily benefits those who had an overly high tax burden before the reform. In Switzerland, capital income gets taxed cumulatively by a high wealth tax, an inflation tax resulting from the principle of nominal taxation, and by full double taxation of dividends. The loss in tax revenue must then be raised elsewhere.

The main argument for the dual income tax in an open economy is, however, that the burden of capital income taxes, in particular, company taxes, mostly falls on labor. Capital income escapes taxation because of high international mobility. In depressing investment in the domestic economy, capital income taxation reduces labor productivity and wages. Implementing the SDIT system boosts market wages by between 3 percent and 4 percent in the long run, which suffices just to protect the net disposable wage, despite the necessary increase in the VAT. In the short run, that is not possible, however, because the losses in tax revenues materialize instantaneously while the wage-increasing gains from induced growth become available only rather slowly. In the short run, workers lose. The benefits are in the long run.

V. Start-Up Investment and Venture Capital Finance

Young innovative firms are a particularly important part of the business sector. They provide a more productive environment to develop new products and commercialize them, compared with large existing companies. Successfully starting up a new firm not only requires considerable capital, but also commercial know-how. Start-up entrepreneurs are often more competent on the technological side, but lack money and commercial experience. Those firms can be innovative, but are also risky. They need external risk capital, which is difficult to obtain from banks because they do not have sufficient collateral or a past track record that banks could rely on to secure their credit. Further, the firm's know-how is concentrated in the founder's person, whose cooperation cannot be contracted in all matters. Hence, the investor must expect important incentive problems and the possibility of opportunistic behavior by the entrepreneur.

Implementing the SDIT system boosts market wages by between 3 percent and 4 percent in the long run.

Venture capital is specialized in financing young innovative start-up firms. Venture capitalists provide not only capital but also commercial advice, business contacts, and monitoring services that promote the firm's commercialization. Because of those value added activities, venture-capital-backed firms on average grow significantly larger and create more value and jobs than other firms. That type of investment is thus particularly important for aggregate innovation and job creation. Although venture capital investments represent only a small part of overall investment and R&D, they are responsible for a disproportionately large share of industrial innovation.[16]

The life cycle of a start-up firm begins with a seed phase when a business plan is developed. Often, the firm can be started only when a venture capitalist decides to provide the money for further research and investments. The entrepreneur and venture capitalist agree on a contract that typically includes equity-like financial instruments (such as straight

[16]See Kanniainen and Keuschnigg (2005) and Gompers and Lerner (1999) for an analysis of the venture capital industry and innovative start-up activity. Kortum and Lerner (2000) estimate the effect of venture capital on aggregate innovation in the United States.

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equity or convertible debt) and pays particular attention to maintaining strong incentives for both entrepreneur and venture capitalist to fully engage in the development of the company. During the subsequent start-up phase, the product or service is refined to become marketable and production is prepared. The firm reaches a mature growth stage when the product is successfully introduced in the market. At that more mature stage, the firm has sufficient access to other forms of finance and the venture capitalist typically exits, for example, by selling her shares in an IPO or by a trade-sale. Many investments simply fail and have to be written off, testifying to the high risk of start-up financing.

Profit and capital gains taxes diminish the private income that can be gained with success and thereby reduce the incentives for effort.

While there are other important policy areas that determine the development of a healthy venture capital industry, taxes and subsidies do play an important role in various stages of the venture capital process.[17] The key message of our formal policy analysis is that taxes are important to determine two margins of entrepreneurial behavior that determine both the quantity and quality of venture capital investments: the start-up decision to determine the rate of business creation; and incentive-driven effort of entrepreneurs and venture capitalists that determines the quality of venture capital investments. In line with traditional public finance analysis, the relative taxation of labor and capital income importantly influences entrepreneurial entry. When dependent employment is taxed more heavily than capital income, potential entrepreneurs are more likely to give up employment and start their own firm.

A number of different taxes are relevant to determine the overall net tax burden on a new firm. At the beginning, governments often provide various subsidies to the cost of capital, such as direct investment subsidies or research grants to innovative firms, or credit guarantees that allow banks to discount their risk and charge a lower interest rate. During the start-up phase, the firm does not pay dividends, but rather needs more capital to finance further expansion. The return to entrepreneur and investor accrues in terms of capital gains when the value of a successful company increases rapidly. Hence, for young start-up firms the capital gains tax is particularly relevant. When the firm records losses or fails, the provisions of the tax code on loss offset and loss carryforward are important. Finally, when the firm grows mature, dividend taxes and corporate taxes become relevant. Irrespective of whether they distort mature firm investment, they are capitalized in firm values. All of those taxes have in common that they reduce the private value of a company and thereby discourage entrepreneurial entry and, via that margin, also the demand for venture capital.

The success and value of new firms quite decisively depend on the entrepreneur's due diligence and effort, as well as on the engagement and strategic support of the venture capitalist. That effort is not contractible *ex ante*, but must rather be secured by making remuneration of entrepreneurs and investors sufficiently sensitive to success or failure. Profit and capital gains taxes diminish the private income that can be gained with success, and thereby reduce the incentives for effort, in addition to discouraging entry. In contrast, a start-up subsidy to the cost of capital is given at the start irrespective of whether the investment will be successful. Those subsidies therefore cannot directly influence the incentives for effort and have no direct bearing on the quality of venture capital.

That key distinction has important consequences for the relative usefulness of selective tax breaks and subsidies as alternative policy instruments to promote venture-capital-backed investments. A start-up subsidy is effective in boosting the rate of business creation, but is not useful in strengthening incentives for higher quality venture capital investments. A tax break, in contrast, becomes available only with success and thereby induces private effort to raise the likelihood of success. In reducing the net tax burden in present value, a tax break also encourages extra entry. The key result of our formal policy analysis is, thus, that the same amount of public money is more effective if it is given as a tax break to young firms, rather than as a start-up subsidy.

On the normative side, some subsidy to the venture capital industry might be justified in the presence of positive spillovers that industrial innovation involves for the entire economy. Further, the need to share the returns to success among entrepreneur and venture capitalist might result in too low an effort in private competitive equilibrium. That argument creates a case to pay particular attention not only for the quantity, but also the quality of venture capital backed investments. These arguments favor selective tax breaks over subsidies to venture-capital-backed start-ups.

[17] I refer to Keuschnigg (2004b, c) and Keuschnigg and Nielsen (2004a, c) for a more detailed discussion of the empirical and theoretical literature on venture capital.

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Compared with the status quo, the SDIT tax reform proposal of the preceding section has probably ambiguous effects on venture capital investments. On the one hand, the allowance for corporate equity and the reduction of the dividend tax represents a major tax reduction for corporate firms, which substantially raises the value of mature firms and should thus encourage both the quantity and quality of venture capital investments. On the other hand, that beneficial effect is probably largely offset in Switzerland by the increase in the effective capital gains tax. The quality and quantity of venture capital investments would benefit, in the interest of aggregate innovation and growth, if the tax reform was complemented by a selective tax break on the capital gains tax. As shown by Keuschnigg and Nielsen (2004), that amendment to the SDIT reform could be made self-financing if that tax break were combined with an elimination of the existing subsidies to start-up investments. That strategy would replace a non-performance-related capital subsidy with a performance-related tax break, and would be welfare-improving.

VI. Conclusion

A growth-oriented tax policy must surely concentrate on the taxation of capital income. Company and firm level taxes on capital income not only reduce the level of capital accumulation, but also stand in the way of an efficient allocation of capital across alternative uses. Apart from the growth-reducing burden on extensive and intensive investment, the practice of capital income taxation also tends to favor debt over equity, making firms more vulnerable against adverse profit shocks. It also favors internal investment financing via retained earnings, instead of external financing with new risk capital. In preventing dividend distributions and favoring internal investment, taxes tend to lock capital into large existing firms and discourage dividend payments to investors, which would facilitate the reinvestment of scarce funds in other firms with more profitable investment opportunities. The tax discrimination of external equity financing particularly hurts young growth companies that do not have sufficient free cash flow to self-finance all their profitable investment opportunities and therefore need external equity capital.

Taxes affect large and small firms as well as domestic and multinational firms quite differently. For example, personal taxes on dividends and capital gains are mainly relevant for domestically owned family firms, but are of minor importance for multinational companies listed on international stock markets. Those firms must pay attention to large institutional investors and foreign investors that are not subject to domestic personal taxes. Firm level taxes, such as the corporate tax, however, reach all corporations, whether they are domestically or foreign owned. A growth-oriented tax policy must thus consider company level taxes with priority. Tax theory also suggests that small open countries should optimally reduce source taxes at the firm level, such as the corporation tax.

The SDIT reform proposed in this paper is broadly in line with the results of optimal tax theory.

Given intense international tax competition in the face of high international capital mobility, a dual income tax allows small countries to flexibly react to these international pressures. The SDIT reform proposed in this paper is broadly in line with the results of optimal tax theory. In introducing a tax allowance for the cost of equity, it reduces the effective marginal tax rate at the firm level to zero, but continues to tax economic rents and monopolistic profits that have no bearing for the marginal investment projects. It also substantially reduces the average effective tax rate, thus making the home economy a more attractive location for international investment from a tax perspective. The SDIT system continues to tax capital income at the personal level with a low flat tax rate. That flat rate is a major simplification of the existing tax code. The SDIT system has many attractive neutrality properties for financial structure, organizational form, and entrepreneurship. In addition to strengthening the level of investment, it should also assure a more efficient allocation of capital to alternative uses. It was estimated that the implementation of the SDIT system might permanently add between 2.5 percent and 3.5 percent of GDP. That is probably a conservative estimate that does not take account of the potential gains to innovation and the long-run growth rate. ◆

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