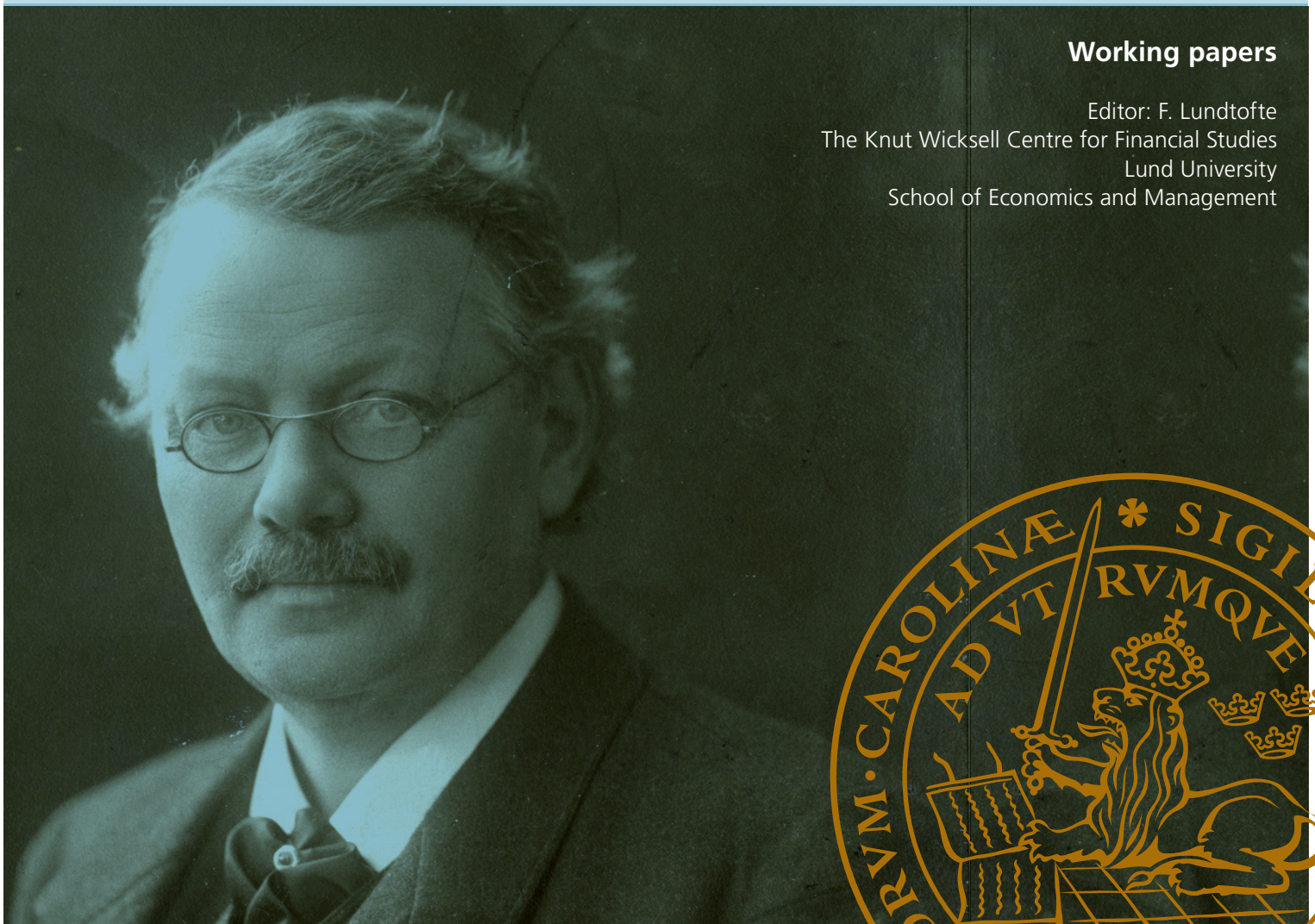
Taxation of dividend income and economic growth

MARGARETA DACKEHAG | ÅSA HANSSON

KNUT WICKSELL WORKING PAPER 2016:4



Working papers

Editor: F. Lundtofte
The Knut Wicksell Centre for Financial Studies
Lund University
School of Economics and Management

Taxation of dividend income and economic growth

Margareta Dackehag and Åsa Hansson*
Department of Economics
Lund University

Abstract

Recently, researchers have turned to analyze how the tax structure, rather than the overall tax level, affects economic performance. For instance, several papers have investigated how the taxation of corporate and individual (labor) income influences growth. The taxation of dividend income may also influence growth via its impact on investments and firm behavior. Within the academic community, there are conflicting views about the impact that taxation of dividends has on firm behavior and, hence, on economic performance. According to the "new view", the taxation of dividends does not influence the marginal cost of capital and consequently has no impact on investment decisions. According to the "old view", the taxation of dividends is distortionary and increases the cost of equity. In the "agency view", an underlying cause of this distortionary effect is principal-agency problems between management and owners, resulting in social costs due to the inefficient use of locked-in capital. To our knowledge, this paper is the first study to explore how the taxation of dividend income affects economic growth by using panel data from 1990 to 2008 for 18 European countries. We find that the taxation of dividend income negatively influences economic growth, a result that corroborates the "old view" of dividend taxation as distortionary. We do not find the same negative correlation between economic growth and taxation of labor and corporate income.

JEL classification: H21; H24; H25; O40

Keywords: Economic growth, taxation of dividend income, taxation of corporate income, taxation of personal income

---

*Corresponding author, Department of Economics and the Knut Wicksell Centre for Financial Studies, Lund University, Sweden and Research Institute of International Economics, e-mail address: asa.hansson@nek.lu.se.
The authors thank participants at the 17th annual conference on European integration, SNEE, and particularly Lawrence Kryzanowski and Magnus Henrekson for the valuable comments on an earlier draft.

1. Introduction

As the globalization process and the international mobility of resources have intensified, so have tax competition and the pressure placed on domestic tax systems. As a consequence, research has increasingly focused on how different taxes, rather than the overall tax level, affect economic behavior. For instance, it is by now fairly well established that the corporate tax rate negatively affects investments and influences where profits are reported. Consequently, corporate tax rates have declined worldwide. The average rates in the EU and OECD member countries were 41.6 and 41.0 percent, respectively, in 1990; by 2014, these rates had declined to 24.3 and 25.3 percent, respectively (OECD, Tax database, 2015). At the same time, the less mobile tax bases have seen increased tax burdens. For instance, the share of property taxation over total tax revenues has almost doubled from 0.8 (EU) and 0.6 (OECD), respectively, to 1.3 (EU and OECD) percent of total tax revenues from 1990 to 2013 (OECD, Tax Revenue Statistics).

One tax that has received considerable attention in the academic community for decades is dividend taxation. The potentially detrimental effects of the dividend tax on investments and firm behavior have been debated since the 1970s, and the controversy is still far from resolved. Whether the "new view" - which claims that dividend taxation is irrelevant for firms' investment decisions and hence should be considered a lump sum tax - or the "old view" - which claims that dividend taxation affects capital costs and thereby investment decisions - more accurately describes reality is still debated. More recently, the "agency view" has been added to the controversy. This view claims that by locking in capital, dividend taxation leads to social costs because the locked-in capital is used inefficiently due to principal-agent problems between management and owners. As a result of this controversy, numerous studies have been undertaken to test the accuracy of the different views. Commonly, the effect that a change in dividend taxation has on the amount of dividends distributed has been tested. Even though the empirical results are somewhat mixed, most studies tend to support the dividend tax being distortionary (Zodrow 1991). Despite this finding, the direct effect of the dividend tax on overall economic performance is basically unstudied. Recent studies on the structure of taxation and economic growth tend to treat personal income in aggregate (Arnold 2008; OECD 2010). Personal income is heterogeneous, as it often groups labor and capital income together and is taxed at progressive rates; therefore, it is likely to have different distortionary effects and, hence, different effects on economic performance.

Despite the lack of research on the effect of the dividend tax on economic growth, the Bush administration implemented a dividend tax cut in 2003 in order to boost US economic performance ("Jobs and Growth Tax Relief Reconciliation Act"). The effect of this cut has been studied and generally found to have increased the dividends distributed and induced a more efficient distribution of investments across firms (Chetty and Saez 2006).

This paper examines the correlation between income taxation in general, and the taxation of dividends in particular, and economic growth. It accomplishes this by studying how the taxation of dividend income, corporations and top labor income impact economic growth in 18 European countries during the period 1990 to 2008.[1] We follow standard growth estimation techniques with country and year fixed effects to determine the effect of income tax rates on GDP per capita growth.

The paper is organized as follows. The next section analyzes why the taxation of income, and dividend income in particular, may affect economic growth. Section 3 provides a brief summary of the empirical literature on taxation and economic growth and motivates our approach. Section 4 describes the method and section 5, the data. Section 6 presents the results, section 7 provides some sensitivity analyses, and finally, section 8 concludes the paper.

2. Taxation of income and economic growth

There is a vast literature on how taxation distorts individuals' and firms' decisions concerning, for example, how much labor individuals supply, how hard they work, how and where investments are made, and where firms choose to locate production and profits. Numerous studies have investigated how corporate and labor taxation, and not least the taxation of dividends, affect individuals' and firms' behavior. Different taxes may, hence, have different effects on the *level* of economic activity. Whether these effects carry over to also impact the *growth rate* is less clear.[2]

2.1 Taxation of dividend income

[1] The countries included are Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the UK.

[2] This observation relates to the difference between the neoclassical growth models developed by Robert Solow in the 1950s and the endogenous growth models developed by Paul Romer and Robert Lucas in the 1980s. In the neoclassical growth models, taxes have no permanent effect on per capita GDP growth, regardless of the distortionary effects of the taxes. In the endogenous growth models, however, they do.

There is no consensus within the academic community about the impact that the taxation of dividends has on firm behavior and, hence, on economic performance. There are competing views with quite different implications about the effects of abolishing double taxation.[3]

According to the "new view", the taxation of dividends does not influence the marginal cost of capital and consequently has no impact on firms' investment decisions (Auerbach 1979; Bradford 1981). Dividend taxation can be regarded as a lump-sum tax. The underlying argument states that firms finance their activities through retained earnings and thus avoid double taxation. Instead of issuing new equity, existing profits are reinvested rather than distributed to shareholders, and therefore no dividend tax is triggered. According to this view, future dividend taxes are already capitalized in share prices, implying that a reduction in dividend taxation would result in windfall gains to existing shareholders who would benefit from increasing stock prices. Abolishing double taxation would, hence, be undesirable and would result in large revenue losses to the government, leave the capital costs of investments unchanged but provide large windfall gains to existing shareholders. Moreover, even though the taxation of dividends may lower domestic savings, it is thought not to impact the amount of investments made, as domestic capital is replaced by foreign. In small open economies, foreign capital is assumed to be a perfect substitute for domestic capital, making the taxation of dividends irrelevant for firms' investment costs. According to the new view, we would not expect a negative relationship between dividend taxation and economic growth; on the contrary, if assumed to be a lump sum tax, it is an efficient tax to use. Empirical support for the new view of equity taxation is found by, e.g., Lindhe (2002) for Sweden and Auerbach and Hassett (2003, 2006) for the US.

Contrary to the "new view", the "old view" assumes that the taxation of dividends is distortionary as it reduces the available equity capital for firms and investments (Feldstein 1970; Poterba and Summers 1985). An increase in the dividend tax rate will raise the effective tax rate on investment income and discourage investment. In addition, an increased tax rate will discourage payouts and reduce the capital available for new investments. There is empirical evidence supporting this hypothesis. For instance, Becker et al. (2013), Poterba (2004), Nam et al. (2010) and Chetty and Saez (2005, 2006) find that higher dividend tax rates are associated with lower

[3] In many countries, business profits are subject to double taxation. Profits are first taxed at the corporate level and then again when the remaining profits are made available to the owner through either dividend or capital gains taxation.

distributed dividends and thereby more available capital for financing investments in other and new firms.

The “new view” is based on assumptions whose practical relevance can be questioned. As Zodrow (1991, p. 507) puts it, “The theoretical models underlying the new view are simple and elegant, but are problematic because they generally are based on the increasingly questionable assumptions that share repurchases are precluded”. Beyond that, it is presumed that the firm already exists and is mature enough to make sufficient profit to finance marginal investment. For firms lacking profits, or for entrepreneurs with unrealized business concepts, the tax on dividends affects the cost of financing and, hence, the investment decision. Thus, the different views may be relevant for different evolutionary steps in a firm’s life cycle.

The “new view” also ignores issues around asymmetric information. There are several aspects of asymmetric information that are relevant for the taxation of dividends. According to the more recent “agency view” (Kanniainen 1999; Gordon and Dietz 2006; Chetty and Saez 2010; Koethenburger and Stimelmayr 2014), the dividend tax leads to an inefficient allocation of capital. The dividend tax tends to lock in capital, and due to the principal-agent problems between management and owners, capital kept in the firm may be used to maximize the utility of management rather than the wealth of the owners. As the dividend tax locks in capital in mature firms, it reduces allocative efficiency and harms new and small firms that could potentially achieve better returns. Chetty and Saez (2010) have demonstrated that this effect of dividend taxation gives rise to high social costs. More generally, free cash flow has been found to lead to overinvestment and the creation of corporate empires (Jensen 1986; Harford 1999; Richardson 2006). Consistent with this finding, Koethenburger and Stimelmayr (2014) show that unproductive investments increase when retained earnings can be used.

Additional negative aspects of personal capital taxation have been noted by Keuschnigg and Nielsen (2004), who show how both dividend and capital gains taxes inhibit entrepreneurs' efforts and lead to social welfare losses. They model the efforts of entrepreneurs and venture capitalists and show that because profit is shared, effort is reduced; introducing a tax on capital income further reduces the effort of both the entrepreneur and the venture capitalist and leads to social welfare losses. Moreover, Poterba (1989) shows that high levels of personal capital taxation negatively impact not only the supply but also the demand for risk-willing capital by reducing individuals' incentives to become entrepreneurs. Dividend taxation also distorts the type of

investments that are made: investments that generate continuous returns, such as dividends and interest, are disadvantaged in relation to investments that generate increases in value. As a capital gains tax leads investors to retain their investments in order to avoid paying tax, the optimal composition of investment portfolios may be prevented. Further support for capital taxes having an impact on firm behavior is found by Henrekson and Sanandaji (2016). They review the recent literature and conclude that capital taxes are found to impact firm behavior, particularly entrepreneurship, when more complex and realistic models are used. They also observe that the findings from empirical research contradict the "new view" assumption that taxes on domestic business owners do not affect their behavior because of the compensating inflows of foreign capital. Instead, there is a strong "home bias" in business ownership (cf. Karolyi and Stulz 2003; French and Poterba 1991; Dahlqvist et al. 2003; Sendi and Bellalah 2010). A report from the OECD (2010) confirms this statement, as it finds that larger companies that have access to foreign capital markets are less affected by dividend taxation than smaller businesses lacking access to foreign capital.

In summary, there are many arguments for dividend taxation influencing firm behavior, primarily small firms and new business creations. These aspects may also carry over to impact economic growth.

2.2 Taxation of labor and corporate income

The taxation of personal labor income may influence economic growth by affecting human capital investments, the supply of labor, and work effort. Proportional income taxes do not influence education decisions, as the government shares equally in the forgone earnings and the future return from education (Trostel 1993). Progressive income taxes discourage education, however, as the amount of taxes saved while in school is less than the amount paid on future returns to education (Heckman et al. 1998). An extensive literature on incentives and work effort finds a positive relationship between the two, suggesting that higher taxes, i.e., lower net returns, increase production costs and decrease efficiency (see, e.g., Ehrenberg 1990 and Prendergast 1996 for reviews). Similar results have been found in the tax response literature, with several studies revealing that high-income earners in particular respond to lower net returns by reducing effort rather than reducing hours worked (see, e.g., Gruber and Saez 2002).

The taxation of corporate income reduces the net return to investments and could lower the return on innovations and reduce the amount spent on research and development, thereby impacting

growth negatively. In addition, corporate taxation discourages foreign direct investment and firm productivity and hence hampers economic growth (e.g., De Mooij and Ederveen 2006; Feld and Heckemeyer 2011; Schwellnus and Arnold 2008; Vartia 2008). Similar effects have been found for labor taxation (Hajkova et al. 2006; OECD 2010; Hansson and Olofsdotter 2014).

Furthermore, both corporate and labor income taxation may affect entrepreneurial activity (see, e.g., Johansson et al. 2008), which enhances economic growth by creating new ideas and promoting technological change. There are several paths through which taxes can affect the amount of entrepreneurial risk-taking. In countries where entrepreneurial income is taxed at lower rates than personal income, high personal income tax rates encourage individuals to become entrepreneurs in order to avoid highly taxed personal income.[4] The treatment of losses may also influence entrepreneurial activity. The classical Domar and Musgrave (1944) result suggests that higher taxes encourage risk-taking as the government, by allowing loss offsetting, shares the risk with the entrepreneur (cf. Myles 2009). Progressive taxation, however, discourages risk-taking because losses push entrepreneurs into low tax brackets, reducing the value of the loss offset, while profits push entrepreneurs into high marginal tax brackets, reducing their net profit (see, e.g., Gentry and Hubbard 2000). This argument is also consistent with results from Sweden that show that high marginal tax rates on personal income retard firm start-ups (Hansson 2012).

3. Empirical literature on taxation and economic growth

There is a quite sizeable literature studying the effect of taxation on economic growth. More recently, the focus has shifted from studying the overall effect of taxation to instead investigating the structure of taxation and economic growth. The results from these studies are mixed and, hence, hard to draw policy implications from. On the one hand, Dowrick (1993) finds personal income taxes to have a negative impact on economic growth, while his results indicate no such relationship for corporate tax rates and economic growth. These findings are consistent with Widmalm's study (2001), which investigates the GDP growth effect of the tax structure, defined as the proportion of tax revenues stemming from taxes on personal income, corporate income, property taxes, taxes on goods and services, and taxes on wages, and a measure for tax progressivity. Her results reveal a

[4] It is important to note that the definition of entrepreneurship is vague, even though most scholars agree that it is important to differentiate between entrepreneurship and self-employment.

negative correlation between the proportion of tax revenues from personal income taxes and economic growth, while she finds no such correlation for the proportion of corporate tax revenues.

In contrast, Arnold (2008) and Lee and Gordon (2005) find corporate income tax to be the most harmful to economic growth. Arnold (2008) uses annual panel data for 21 OECD countries to study the link between tax structure and economic growth and finds that a stronger reliance on income taxes implies significantly lower levels of GDP per capita than the use of taxes on consumption and property. Among the income taxes, he finds corporate income taxes to be associated with lower levels of GDP per capita than personal income taxes (cf. OECD 2010). Xing (2012), however, shows that Arnold's results are not robust under different assumptions about heterogeneity across countries and the underlying econometric model and finds no robust ranking among corporate income taxes, personal income taxes, and consumption taxes.

Lee and Gordon (2005) estimate the impact of statutory corporate and personal income tax rates and the value added tax rate on GDP per capita growth using panel data from 70 countries during the time period 1970 to 1997. Their results show a significant negative correlation between statutory corporate tax rates and growth but no significant correlation between top statutory personal income tax rates and growth. When they restrict the sample by including an OECD dummy, the corporate tax rate effect on growth for the OECD countries becomes nearly zero, suggesting that corporate taxation is less harmful to growth in more developed countries than in less developed countries.

Reviewing the literature, we conclude that the empirical evidence of a relationship between the structure of taxation and economic growth is weak, which indicates a need to further research this relationship. There are several potential explanations for the inconclusive results. One shortcoming of these studies is that they, with the exception of Lee and Gordon (2005), tend to use backward-looking average tax measures based on tax revenues. As distortions from taxation are to a large degree influenced by forward-looking marginal tax rates, it may be more fruitful to analyze the link between marginal tax rates and economic growth.

Another shortcoming with existing studies analyzing the structure of taxation is that they tend to aggregate personal income, grouping labor and capital income together. As income from labor and capital may have very different incentive effects and, thus, affect economic growth differently, this may be a serious problem. For example, the taxation of dividend income may or

may not, for the reasons explained above, be more harmful to economic growth than the taxation of labor income.

Our study tries to circumvent these shortcomings. Like Lee and Gordon (2005), we also use marginal tax rates on corporate and personal income as our tax measures rather than measures based on tax revenues.[5] Economic theory predicts that marginal tax rates will play a role in the distortions introduced to individuals' and firms' choices. According to theory, they influence decisions concerning the level of investments undertaken, additional income earned, and entrepreneurial effort and are, hence, the relevant tax rates for economic growth. Average tax rates, however, influence the discrete decisions as to whether to invest or work at all. Additionally, average rates are more correlated with government expenditures than marginal rates and may hence effect economic growth positively, while marginal tax rates should, according to theory, be negatively correlated with growth. The difficulty lies in determining what marginal tax rate to use, as different rates apply to different levels of income (due to various rates but also due to exemptions, credits, and depreciation allowances). To avoid some of these issues, we choose to use the top marginal tax rate on both personal and corporate income.

Unlike Lee and Gordon, we disentangle the effect of the taxation of dividends from aggregate personal income to allow for heterogeneous effects. Even though there is a sizable literature documenting the impact of dividend taxation on investment costs and the allocation of investment, the direct link between the dividend tax and economic growth has, to our knowledge, been unstudied. We also focus on European countries, as the effect of taxation on economic growth likely varies greatly between rich and developing countries.

In addition, our analysis takes into account that the tax structure may have both distortionary as well as non-distortionary components and that the government expenditure structure may contain both productive and non-productive components (cf. Kneller et al. 1999; Gemmell et al. 2007; cf. Afonso and Alegre 2011). Disregarding this dimension may bias the results, as shown by Kneller et al. (1999). More specifically, adding fiscal variables in an ad-hoc manner without taking into account the government budget constraint can lead to misspecification and incorrect conclusions. Instead, how a tax is used or a public expenditure is financed need to be controlled for. We follow Kneller et al. (1999) and Gemmell et al. (2007) and control for productive public expenditures and exclude non-productive spending. This means that an increase in a

[5] We do use tax rates based on tax revenues as a sensitivity test.

particular tax rate should be interpreted as the effect of raising a particular (distortionary) tax and spending the obtained revenues on non-productive activities. Consequently, we omit the presumed non-distortionary taxes on consumption and property.

4. Empirical method

We estimate the effect of tax rates on economic growth using a fixed effects regression model, a standard approach within the literature that is capable of accounting for many unobservable factors that may be confounded with the functioning of the tax system. The fixed effects estimator may remedy the problem of omitted variable bias as long as they are constant over time. Factors such as national culture, legal-political institutional infrastructure, and government efficiency have been found to influence growth and are likely to be correlated with tax rates. Omitting such factors would lead to biased estimates.

The regression model can be written as follows:

$$g_{it} = X'_{it0}\beta + Z'_{it}\gamma + \mu_i + \delta_t + \varepsilon_{it} \qquad (1)$$

The dependent variable, g_{it}, denotes economic growth for country i at time period t and is measured as the difference of logarithmic per capita GDP. X_{it} is a vector of measures of the corporate and personal income tax rates in year t. Z_{it} is a vector of explanatory variables, including the variables initial income (per capita GDP in year t-2), national investment, openness (exports and imports as a share of GDP), and growth rate of the labor force together with government productive spending[6] and government surplus.

The μ_i terms are fixed country effects (i.e., unmeasured shocks). These terms account for time-invariant determinants of economic growth that vary among the countries in our sample. If μ_i were correlated with X_{it0} in equation (1), then estimators that failed to include the country-specific fixed effects would yield inconsistent estimates of the effect of taxation on economic growth.

The δ_t terms are sample-wide period effects. These terms account for trends that affect the economic growth in each of the countries similarly, such as business cycles. Tax rates are likely

[6] Table A1 in the Appendix shows the functional classification of expenditures into distortionary and non-distortionary categories and revenues into productive and non-productive categories in accordance with Kneller et al. (1999).

affected by these events and a model failing to account for such trends would confound them with the effects of changing tax rates. The terms β and γ are parameters to be estimated. The ε_{it} terms are idiosyncratic disturbance terms that vary by country and time period; they are assumed to be independently and identically distributed with mean zero and variance σ_{ε}^2.

Studies on taxes and growth may suffer from several statistical problems. One is the endogeneity problem. Tax rates may both influence economic growth and be influenced by it. High taxes may cause lower growth rates, but periods of low growth rates may require raising tax rates to finance increased expenses from, for example, higher unemployment rates. To investigate this potential problem, we complement the analysis with regressions using 1-year lags on all explanatory variables.

To remove business cycle effects, it is common in the literature to use 5-year averages. The persistence of tax rates over time also motivates averaging over time instead of using annual data. To take this into consideration, we also run regressions based on averaging, but in order to obtain sufficient observations, we use 4-year averages for per capita GDP growth and the other explanatory variables.[7] However, the variable for initial income per capita has a 4-year lag, taking on the first value in the previous 4-year period, whereas the tax rate variables take on the initial values in each (current) 4-year period.

As argued earlier, the analysis of the effect of taxes on economic growth may produce more accurate results if it uses forward-looking marginal tax rates, our explanatory variables of interest, rather than backward-looking average tax measures based on tax revenues. However, as a robustness test, we regress GDP growth per capita on the latter type of tax measure as well, more specifically, on the share of tax revenues from individual capital income, individual labor income and corporate income.

5. Data

We focus on institutionally fairly similar countries, and our dataset is a panel of 18 European countries covering the period from 1990 to 2008. The dataset contains OECD data on GDP per capita and its growth rate, national investment as a share of GDP, exports and imports as a share of GDP (openness), the growth of the labor force and the government budget surplus. Data from

[7] Kneller et al. (1998) have shown that the results are somewhat sensitive to how the 5-year averages are constructed, with respect to the starting year of the time periods.

the IMF Government Finance Statistics Yearbook (GFSY) are used to construct the variable measuring government productive spending as a share of GDP. Data on the various statutory tax rates come from the European Tax Handbook of the International Bureau of Fiscal Documentation (IBFD), the World Tax Database from the Office of Tax Policy Research (OTPR) at the University of Michigan, and the OECD Tax Database (top marginal statutory tax rate in dividend income at shareholder level).[8] Table 1 shows a summary description of the variables and their sources. Due to data limitations on government productive spending as a share of GDP, our data end in 2008. Apart from this limitation, the financial crises starting in 2008 motivate our choice of time period.

Figure 1 illustrates the development for the corporate income tax rate, the top marginal tax rate on personal income, and shareholders' top tax rate on distributed dividends (annual averages). The corporate tax rate (blue line in Figure 1) and top marginal tax rate on labor income (red line in Figure 1) both experienced considerable reductions in the decade preceding the starting year of our period of study. The decline continued from 1990 onwards, particularly with regards to the corporate income tax, which shifted from a rate above 35 percent to roughly 25 percent. The average top marginal tax rate on labor income decreased from over 50 percent to nearly 45 percent. The average top tax rate on dividends (green line in Figure 1) also declined during the 1990s and 2000s, but on a smaller scale, from a mean rate of nearly 25 percent to 20 percent. The variation over time and across countries is substantial when it comes to all taxes, but in particular for dividend taxation. In the beginning of the time period, Greece had a dividend taxation of 50 percent; this rate was reduced to zero and then increased to 10 percent in 2009. Across countries, the rate varies from over 30 percent in Italy to zero in, e.g., Greece and the United Kingdom.

6. Results

Table 2 reports the results from the fixed-effect regression of the dividend income tax rates and the other two income taxes and GDP per capita growth. The first four columns refer to model specifications including only the dividend tax. Columns 1 and 2 contrast the regression results where we respectively include and exclude initial income. We make this comparison based on the argument that the control for initial income may capture too much of the effect of other explanatory

[8] Data on the corporate tax rate range from 1970 to 2010, while data on the top marginal tax rate on personal income cover the period from 1975 to 2010. The top tax rates faced by shareholders on distributed profits range from 1990 to 2011.

variables, considering that we are studying countries that are quite similar in terms of GDP. Columns 3 and 4 show the results from our investigation into the temporal aspect of how taxes affect growth. Considering that it may require some time for individuals and corporations to adjust to changes in tax rates, it may not be the tax rate for this year but rather the previous year that impacts current growth.

The coefficient for the dividend tax is negatively and statistically significant in columns 1 and 2. The coefficient is somewhat larger in size when excluding initial income but, by and large, is not much affected by the inclusion of initial income. Specifically, the coefficient corresponds to a semi-elasticity of almost 0.001, meaning that a one percentage point increase in the taxation of dividends corresponds to 0.001 percent lower GDP per capita growth. Surprisingly, national investments are negatively correlated with GDP per capita growth. Openness positively and statistically significantly (only at 10 percent in column 2) correlates to per capita GDP growth, while government surplus, government productive spending, and labor force growth are all insignificantly correlated with the growth rate. Using 1-year lags of explanatory variables (note that initial income continues to have a two-year lag), we observe that the dividend tax loses significance when we also account for initial income. The dividend tax estimate is weakly significant in column 4 and slightly smaller than the estimate in column 2, where we consider "current" effects. The effects of other variables that were significant in *t* are now larger, and the estimates are more significant.

Columns 5 to 8 present the results of model specifications corresponding to those in columns 1-4 but with the addition of corporate income tax and top marginal tax rates on labor income. The results show the same pattern as in columns 1-4. Interestingly, the other income taxes are insignificant in all specifications.[9] That the corporate income tax rate is insignificantly correlated to growth is somewhat surprising. To test whether this result stems from our study of a relatively recent time period when corporate tax rates have in general been low, we exclude the dividend tax rate from the specification in order to maximize the time periods for the corporate tax rate and the top marginal tax rate on labor income. However, this does not change the results, possibly due to small differences between countries when it comes to corporate taxation. This is

[9] We have also tested specifications including only one tax at a time, following Myles' (2009) result that tax regressions deliver better results when each form of tax is included separately. However, the corporate and labor tax rates are again insignificant when included separately.

also consistent with results from Lee and Gordon (2005), who find the effect of the corporate tax rate to be of less importance for growth in OECD countries compared to developing countries. The only income tax that achieves statistical significance is the dividend tax rate.

Table 3 shows the results of using 4-year averages instead of annual measures to control for business cycle effects. Basically the same pattern appears here as before. The dividend tax rate estimates are significant, although only weakly in specifications including initial income.

As a robustness test, we also consider tax rates based on tax revenues. Table 4 presents estimates from regressions using income taxes as the share of tax revenues on GDP growth, based on annual data. Again, the findings are similar to those in Table 2. The dividend tax rate is significantly correlated with per capita GDP growth in the lagged specifications (columns 3, 4, 7, and 8). Compared to Table 2, the estimates are similar in magnitude but more significant. Interestingly, the corporate income tax measure is positively and statistically significant in three of the four specifications. This could reflect that countries with competitive corporate tax rates are able to attract business activities and increase their tax base. Indeed, the correlation between corporate tax rates and tax revenues obtained is negative with a correlation coefficient of -0.214.[10] This suggests that tax rate measures based on tax revenues poorly represent the distortionary effect of taxation. Last, Table 5 reports results from regressions on income taxes as a share of tax revenues and GDP growth using 4-year averages. Again, the dividend tax is the only tax rate that indicates a negative correlation between tax rates and economic growth.

7. Sensitivity analysis

Recently, researchers in the field of economic growth have turned to the use of pooled mean group (PMG) estimators to allow for heterogeneous short-term effects (Ojede and Yamarik 2012). Unfortunately, our data does not cover a long enough time span to allow us to perform a PGM estimation. To address the time effect and to find the long-term effects of dividend taxation on economic growth, we instead re-run the fixed effects model but lag the tax rate variables with up to 6 time lags.[11] The top part of Table 6 reports the results for the dividend tax in isolation,

[10] The corresponding correlation coefficient for top labor tax rates and tax revenues from labor taxation as a share of total tax revenues is -0.024 and that for dividend tax rates and tax revenues from private capital income taxation as a share of total tax revenues is -0.090.

[11] Gemmell et al. (2007) argue that up to 8 annual time lags are required. Due to data limitations, we use 6 annual time lags.

corresponding to rows 1-4 in Table 2, while the bottom part reports the results for all three tax rates, corresponding to rows 5-8 in Table 2. In addition, the table reports the results when the specification includes and excludes initial income, respectively. The results strengthen the hypothesis that the dividend tax hurts economic growth in the long run. For the corporate and labor tax rate, the results provide no support for a negative correlation between these taxes and economic growth.

To address potential endogeneity, we also estimate the correlation using the GMM estimator developed by Arellano and Bond (1991), which controls for endogeneity using the lagged values of the levels of the endogenous and of the predetermined variables as instruments. More specifically, we run a two-step system GMM for dynamic panel data (as developed by Arellano and Bover 1995), treating all variables as endogenous and using robust standard errors. The negative correlation between economic growth and the dividend tax remains, although the significance level is reduced.[12]

Our data end in 2008, but if we exclude government productive spending, the data period can be extended to 2010. Expanding the time period to 2010 does not change the results in any substantial way. The fit of the model is slightly reduced as well as the magnitude of the coefficient of the dividend tax.

The corporate tax rate has previously often been found to negatively correlate with economic growth. We do not find that to be the case in our sample. To further investigate whether this is due to the sample of countries (supporting Lee and Gordon (2005) result that the corporate tax rate is less harmful in OECD countries) or to the tax measure used, we alternatively use effective forward-looking corporate tax rates instead of statutory rates and rates based on tax revenues. More specifically, we use the forward-looking marginal and average effective tax rates developed by Devereux et al. (2002), but the correlation between these tax measures and economic growth is also insignificant.

Additionally, we investigate whether membership in the EU and the EMU affects the correlation between taxes and economic growth. We do so by including a dummy for EU and EMU membership, respectively. While EU membership appears to have a positive impact on economic

[12] The coefficient for dividend taxation is -0.037 with a t-statistic of -1.56. The other two tax rates are insignificant. Results are not presented but can be obtained from the authors.

growth, the inclusion of the EU dummy does not change the correlation between tax rates and economic growth. Including the EMU dummy has no bearing on the results whatsoever.

8. Conclusions

Intensified competition between countries and increasing demand for publicly financed services pressure individual countries to design efficient tax systems. To design efficient tax systems, it is crucial to know how distortive and harmful different taxes are to economic growth. This paper provides some insights into the relationship between the taxation of income, in particular dividend income, and economic growth. We do so by studying the correlation between statutory tax rates on corporate and personal income and economic growth in 18 European countries during the period 1990 to 2008.

Our results suggest that the dividend tax rate may be distortionary and more harmful to economic growth than corporate and labor income taxes, thus supporting the "old view" of dividend taxation. Our results are robust over several different specifications and tax measures. However, results may be country-group specific, as we study countries with similar characteristics, and not applicable to other regions. Adjustments of corporate and labor income taxes may be better tuned in Europe than in developing countries. However, our results suggest that the dividend tax rate can be adjusted in order to boost economic growth.

Table 1. Variable description. All variables are annual averages unless stated otherwise.

Variable	Obs	Mean	Std. Dev.	Min	Max	Description
ln GDP growth per capita	342	0.05	0.03	−0.06	0.19	Logarithmic average annual growth rate of GDP per capita
Initial income	342	24817.70	9198.63	9159.50	78523.30	GDP per capita with two-year lag, current prices millions US $
Investment	342	21.40	3.06	14.89	35.18	National investment as share of GDP
Openness	342	87.47	50.27	35.39	324.36	Exports and imports of goods and services as percent of GDP
Government budget surplus	341	−1.53	4.52	−14.03	18.77	Central government budget deficit as percent of GDP
Government productive spending	243	20.83	4.04	8.56	29.22	Central government productive spending as percent of GDP
Labor force growth	333	0.39	1.05	−4.08	5.06	Average annual growth rate of labor force, percent
Dividend tax	334	21.16	10.19	0.00	50.00	Statutory tax rate on individual dividend income
Corporate tax	339	32.16	6.46	12.50	53.00	Statutory tax rate on corporate income
Top marginal tax on pers labor income	329	48.62	8.41	23.20	71.00	Top marginal statutory tax rate on individual labor income
Ind. capital income tax	294	0.00	0.01	0.00	0.06	Revenue from individual capital income tax, as percent of total tax revenues
Corporate income tax	342	0.08	0.04	0.01	0.29	Revenue from corporate income tax, as percent of total tax revenues
Ind. labor income tax	315	0.25	0.11	−0.01	0.54	Revenue from individual labor income, as percent of total tax revenues

Table 2. Economic growth and income taxes (statutory rates)
Country fixed effects.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	t	t	t-1	t-1	t	t	t-1	t-1
Initial income	−1.59e-06		−2.23e-06*		−1.57e-06		−2.01e-06*	
	(9.98e-07)		(1.12e-06)		(9.63e-07)		(1.10e-06)	
Investment	−0.00121	−0.00151*	−0.00184***	−0.00232***	−0.000976	−0.00123	−0.00132***	−0.00169**
	(0.00102)	(0.000796)	(0.000621)	(0.000784)	(0.00120)	(0.000931)	(0.000412)	(0.000593)
Openness	0.000483**	0.000230*	0.000667**	0.000293	0.000491**	0.000248*	0.000676**	0.000347*
	(0.000181)	(0.000119)	(0.000254)	(0.000184)	(0.000198)	(0.000129)	(0.000263)	(0.000195)
Government	0.00180	0.00163	0.000483	0.000168	0.00175	0.00160	0.000200	−7.97e-05
budget surplus	(0.00143)	(0.00127)	(0.000890)	(0.00103)	(0.00155)	(0.00141)	(0.000990)	(0.00111)
Government	−0.000320	−0.000166	0.000525	0.000676	−0.000237	−7.71e-05	0.000434	0.000544
productive	(0.000596)	(0.000570)	(0.000468)	(0.000498)	(0.000635)	(0.000625)	(0.000464)	(0.000490)
spending								
Labor force	0.00287	0.00369*	−0.000780	0.000385	0.00256	0.00337	−0.000613	0.000487
growth	(0.00173)	(0.00201)	(0.00139)	(0.00176)	(0.00182)	(0.00205)	(0.00147)	(0.00177)
Dividend tax	−0.000934**	−0.00119***	−0.000501	−0.000845*	−0.000924*	−0.00121**	−0.000523	−0.000860**
	(0.000343)	(0.000320)	(0.000365)	(0.000417)	(0.000442)	(0.000440)	(0.000365)	(0.000375)
Corporate tax					−5.56e-05	−0.000130	0.000485	0.000493
					(0.000574)	(0.000522)	(0.000427)	(0.000389)
Top marginal tax					0.000203	0.000313	0.000462	0.000572
pers labor					(0.000553)	(0.000572)	(0.000430)	(0.000472)
income								
Observations	233	233	216	216	227	227	210	210
R-squared	0.457	0.441	0.455	0.427	0.448	0.432	0.450	0.427
Number of code	18	18	18	18	18	18	18	18

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1
All specifications include year fixed effects.

Table 3. Economic growth and income taxes (statutory rates), 4-year averages
Country fixed effects

	(1)	(2)	(3)	(4)
Initial income	−3.82e-06***		−3.34e-06***	
	(8.37e-07)		(7.72e-07)	
Investment	−0.00131*	−0.00172**	−0.000729	−0.000997*
	(0.000682)	(0.000599)	(0.000533)	(0.000527)
Openness	−3.86e-05	0.000202	−0.000251	−1.40e-05
	(0.000457)	(0.000608)	(0.000504)	(0.000612)
Government budget surplus	0.00170*	0.00119	0.00123	0.000852
	(0.000828)	(0.00127)	(0.000897)	(0.00123)
Government productive spending	0.000823***	0.000226	0.000820***	0.000313**
	(0.000170)	(0.000134)	(0.000153)	(0.000142)
Labor force growth	0.00554	0.0115***	0.00565*	0.0110***
	(0.00331)	(0.00358)	(0.00319)	(0.00329)
Dividend tax	−0.000435*	−0.000824**	−0.000537*	−0.000988**
	(0.000232)	(0.000355)	(0.000296)	(0.000345)
Corporate tax			0.000413	0.000217
			(0.000276)	(0.000302)
Top marginal tax on pers labor income			0.000548	0.000749
			(0.000529)	(0.000640)
Observations	74	74	72	72
R-squared	0.686	0.541	0.734	0.628
Number of code	18	18	18	18

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1
All specifications include controls for 4-year time periods.

Table 4. Economic growth and income taxes (share of tax revenue)
Country fixed effects

	(1) t	(2) t	(3) t-1	(4) t-1	(5) t	(6) t	(7) t-1	(8) t-1
Initial income	−1.90e-06*		−1.87e-06*		−2.55e-06**		−2.23e-06**	
	(9.86e-07)		(9.95e-07)		(9.54e-07)		(7.78e-07)	
Investment	−0.00182	−0.00198*	−0.00134*	−0.00158	−0.00166	−0.00190**	−0.00112	−0.00146
	(0.00135)	(0.00110)	(0.000753)	(0.000908)	(0.00102)	(0.000859)	(0.000695)	(0.000883)
Openness	0.000515**	0.000204*	0.000568**	0.000244	0.000703***	0.000262**	0.000623**	0.000226
	(0.000177)	(9.93e-05)	(0.000251)	(0.000195)	(0.000174)	(0.000107)	(0.000214)	(0.000193)
Government budget surplus	0.00210	0.00184	0.000107	−0.000205	0.000779	0.000853	−0.000800	−0.000811
	(0.00150)	(0.00131)	(0.000741)	(0.000884)	(0.00102)	(0.00130)	(0.000880)	(0.00108)
Government productive spending	−0.000153	3.82e-05	0.000232	0.000382	−0.000353	−5.86e-05	0.000248	0.000434
	(0.000661)	(0.000676)	(0.000478)	(0.000536)	(0.000584)	(0.000648)	(0.000452)	(0.000551)
Labor force growth	0.00350*	0.00472**	0.000127	0.00123	0.00369*	0.00516**	0.000305	0.00140
	(0.00190)	(0.00215)	(0.00123)	(0.00150)	(0.00196)	(0.00219)	(0.00126)	(0.00158)
Ind capital income tax	−0.00141	−0.00402	−0.00779***	−0.0102***	−0.000347	−0.00384	−0.00863***	−0.0114***
	(0.00277)	(0.00261)	(0.00212)	(0.00195)	(0.00298)	(0.00303)	(0.00183)	(0.00198)
Corporate income tax					0.00329**	0.00233**	0.00157*	0.000789
					(0.00121)	(0.000841)	(0.000793)	(0.000693)
Ind labor income tax					0.000534	0.000429	−0.000624	−0.000741
					(0.000679)	(0.000800)	(0.000468)	(0.000496)
Observations	215	215	205	205	215	215	205	205
R-squared	0.462	0.439	0.488	0.468	0.497	0.457	0.499	0.474
Number of code	16	16	16	16	16	16	16	16

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1
All specifications include year fixed effects.

Table 5. Economic growth and income taxes (share of tax revenue), 4-year averages
Country fixed effects

	(1)	(2)	(3)	(4)
Initial income	−3.56e-06***		−3.78e-06***	
	(7.78e-07)		(8.75e-07)	
Investment	−0.000873	−0.000903	−0.000971	−0.000783
	(0.000804)	(0.000642)	(0.000872)	(0.000685)
Openness	−0.000190	0.000110	−0.000222	0.000103
	(0.000459)	(0.000625)	(0.000509)	(0.000633)
Government budget surplus	0.00127*	0.000663	0.00116	0.00121
	(0.000707)	(0.00107)	(0.00104)	(0.00149)
Government productive spending	0.000724***	0.000167	0.000798***	0.000193
	(0.000134)	(0.000117)	(0.000144)	(0.000127)
Labor force growth	0.00657*	0.0126***	0.00682*	0.0126***
	(0.00361)	(0.00375)	(0.00352)	(0.00418)
Ind capital income tax	−0.00514***	−0.00782**	−0.00361*	−0.00674**
	(0.00128)	(0.00305)	(0.00180)	(0.00298)
Corporate income tax			0.000656	−0.000248
			(0.000645)	(0.000803)
Ind labor income tax			0.00104*	0.000674
			(0.000573)	(0.000601)
Observations	70	70	70	70
R-squared	0.709	0.589	0.723	0.597
Number of code	16	16	16	16

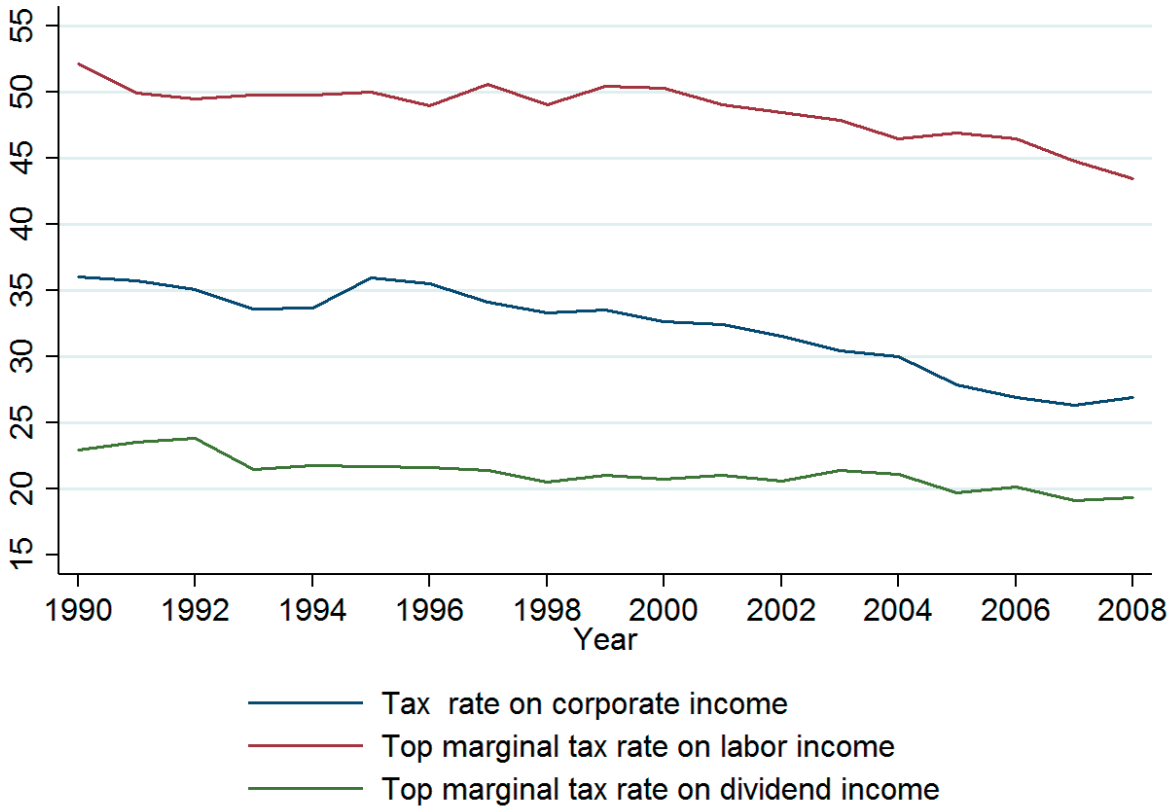
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1
All specifications include controls for 4-year time periods

Table 6. Estimation results for different lags

GDP growth per capita	(1) T	(2) t-1	(3) t-2	(4) t-3	(5) t-4	(6) t-5	(7) t-6
Incl. initial income							
Dividend tax	−0.00093**	−0.00040	−0.00020	−0.00033*	−0.00039**	−0.00055**	−0.00082*
	(0.00034)	(0.00033)	(0.00045)	(0.00018)	(0.00016)	(0.00023)	(0.00042)
Excl. initial income							
Dividend tax	−0.0012***	−0.00070*	−0.00046	−0.00048*	−0.00047**	−0.00062**	−0.00089*
	(0.00032)	(0.00036)	(0.00049)	(0.00026)	(0.00022)	(0.00026)	(0.00046)
Incl. initial income							
Dividend tax	−0.00092*	−0.00033	−0.00046	−0.00031*	−0.00041**	−0.00063***	−0.00095***
	(0.00044)	(0.00033)	(0.00028)	(0.00016)	(0.00016)	(0.00018)	(0.00029)
Corporate tax	−5.56e-05	0.00066**	0.00058*	0.00032	0.00039	0.00124**	0.0022***
	(0.00057)	(0.00031)	(0.00029)	(0.00038)	(0.00041)	(0.00049)	(0.00039)
Top marginal tax	0.00020	0.00038	0.00016	0.00028	0.00019	−7.79e-05	0.00017
on pers labor inc	(0.00055)	(0.00050)	(0.00052)	(0.00056)	(0.00048)	(0.00047)	(0.00053)
Excl. initial income							
Dividend tax	−0.0012**	−0.00059**	−0.00064**	−0.00044*	−0.00049**	−0.00068***	−0.00099***
	(0.00044)	(0.00028)	(0.00028)	(0.00023)	(0.00020)	(0.00019)	(0.00029)
Corporate tax	−0.00013	0.00066**	0.00060*	0.00033	0.00043	0.00128**	0.00222***
	(0.00052)	(0.00027)	(0.00033)	(0.00043)	(0.00044)	(0.00050)	(0.00040)
Top marginal tax	0.00031	0.00050	0.00020	0.00031	0.00016	−8.20e-05	0.00015
on pers labor inc	(0.00057)	(0.00052)	(0.00053)	(0.00054)	(0.00044)	(0.00046)	(0.00051)

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1
All specifications include year fixed effects.

Figure 1. Corporate tax rates, top marginal tax rates on personal dividend and labor income
Annual means



Appendix

Table A1.
Theoretical aggregation of functional classifications

Theoretical classification	Functional classification
Distortionary taxation	Taxation on income and profit
	Social security contributions
	Taxation on payroll and manpower
	Taxation on property
Non-distortionary taxation	Taxation on domestic goods and services
Other revenues	Taxation on international trade
	Non-tax revenues
	Other tax revenues
Productive expenditures	General public services expenditure
	Defence expenditure
	Educational expenditure
	Health expenditure
	Housing expenditure
	Transport and communication expenditure
Unproductive expenditures	Social security and welfare expenditure
	Expenditure on recreation
	Expenditure on economic services
Other expenditures	Other expenditure (unclassified)

Source: Kneller et al. (1999), Table 1, p. 177.

References

Afonso, A., & Alegre, J. G. (2011). Economic growth and budgetary components: A panel assessment for the EU. *Empirical Economics*, *41*(3), 703–723.

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monto Carlo evidence and an application to employment equations. *Review of Economic Studies*, *58*(2), 277–297.

Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, *68*(1), 29–51.

Arnold, J. (2008). Do tax structure affect aggregate economic growth? Empirical evidence from a panel of OECD countries. OECD Economic Working Paper No. 643. Paris: Organisation for Economic Co-operation and Development.

Auerbach, A. J. (1979). Share valuation and corporate equity policy. *Journal of Public Economics*, *11*(3), 291–305.

Auerbach, A. J., & Hassett, K. A. (2003). On the marginal source of investment funds. *Journal of Public Economics*, *87*(1), 205–232.

Auerbach, A. J., & Hassett, K. A. (2006). Dividend taxes and firm valuation: New evidence. *American Economic Review*, *96*(2), 119–123.

Becker, B., & Jacob, M. (2013). Payout taxes and the allocation of investment. *Journal of Financial Economics*, *107*(1), 1–24.

Bradford, D. F. (1981). The incidence and allocation effects of a tax on corporate distributions. *Journal of Public Economics*, *15*(1), 1–22.

Chetty, R., & Saez, E. (2005). Dividend taxes and corporate behavior: Evidence from the 2003 dividend tax cut. *Quarterly Journal of Economics*, *120*(3), 791–833.

Chetty, R., & Saez, E. (2006). The effects of the 2003 dividend tax cut on corporate behavior: Interpreting the evidence. *American Economic Review*, *96*(2), 124-129.

Chetty, R., & Saez, E. (2010). Dividend and corporate taxation in an agency model of the firm. *American Economic Journal: Economic Policy*, *2*(3), 1-31.

Dahlquist, M., Pinkowitz, L., Stulz, R. M. & Williamson, R. (2003). Corporate governance and home bias. *Journal of Financial and Quantitative Analysis, 38*, 87-110.

De Mooij, R., & Ederveen, S. (2006). What a difference does it make? Understanding the empirical literature on taxation and international capital flows. European Economy. *Economic Papers*, *261*. Brussels: European Commission.

Devereux, M. P., Griffith, R., Klemm, A., Thum, M., & Ottaviani, M. (2002). Corporate income tax reforms and international tax competition. *Economic Policy*, *17*(35), 449–495.

Domar, E. D., & Musgrave, R. A. (1944). Proportional income taxation and risk-taking. *Quarterly Journal of Economics*, *58*(3), 388–422.

Dowrick, S. (1993). Government consumption: its effects on productivity growth and investment. In N. Gemmel (Ed.), *The growth of the public sector. Theories and evidence*. Aldershot, UK: Edward Elgar Publishing House.

Ehrenberg, R. G. (1990). Introduction: do compensation policies matter? *Industrial and Labor Relations Review*, *43*(3), 3S–12S.

Feld, L. P., & Heckemeyer, J. H. (2011). FDI and taxation: A meta-study. *Journal of Economic Surveys*, *25*(2), 233–272.

Feldstein, M. S. (1970). Corporate taxation and dividend behaviour. *Review of Economic Studies*, *37*(1), 57–72.

French, K. R., & Poterba, J. M. (1991). Investor diversification and international equity markets. *American Economic Review*, *81*(2), 222–226.

Gemmell, N., Kneller, R., & Sanz, I. (2007). Fiscal policy impacts on growth in the OECD: are they long- or short-term? Mimeo, University of Nottingham.

Gentry, W. M., & Hubbard, R. G. (2000). Tax policy and entrepreneurial entry. *American Economic Review*, *90*(2), 283–287.

Gordon, R., & Dietz, M. (2006). *Dividends and taxes*. NBER Working Paper No. 12292. Cambridge, MA: National Bureau of Economic Research.

Gordon & Lee (2005)

Gruber, J., & Saez, E. (2002). The elasticity of taxable income: Evidence and implications. *Journal of Public Economics*, *84*(1), 1–32.

Hajkova, D., Nicoletti, G., Vartia, L., & Yoo, K. Y. (2006). Taxation and business environment as drivers of foreign direct investment in OECD countries. *OECD Economic Studies*, *43*(2), 7-38.

Hansson, Å. (2012). Tax policy and entrepreneurship: Empirical evidence from Sweden. *Small Business Economics*, *38*(4), 495–513.

Hansson, Å., & Olofsdotter, K. (2014). Labor taxation and FDI decisions in the European Union, *Open Economics Review, 25*(2), 263-287.

Harford, J. (1999). Corporate cash reserves and acquisitions. *Journal of Finance, 54*, 1969–1997.

Heckman, J., Lochner, L., & Taber, C. (1998). Tax policy and human capital formation. *American Economic Review*, *88*(2), 293–297.

Henrekson, M., & Sanandaji, T. (2016). Owner-level taxes and business activity. *Foundations and Trends in Entrepreneurship, 12(1),* 1-94.

International Bureau of Fiscal Documentation, (IBDF), *European Tax Handbook*, various editions. Amsterdam: IBDF.

Johansson, Å., Heady, C., Arnold, J., Brys, B., & Vartia, L. (2008), *Tax and economic growth*. OECD Economic Working Paper No. 620. Paris: Organisation for Economic Co-operation and Development.

Jensen, M.C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *American Economic Review, 76*, 323–329.

Kanniainen, V. (1999). Failures in corporate governance: can the corporation tax improve efficiency? *FinanzArchiv, 56*, 310–334.

Karolyi, G. A., & Stulz, R. M. (2003). Are financial assets priced locally or globally? In G. M. Constantinides, M. Harris, R. M. Stulz (Eds.), *Handbook of the Economics of Finance*. Amsterdam: North Holland.

Keuschnigg, C. & S.B. Nielsen, (2004). Start-ups, venture capitalists, and the capital gains tax. *Journal of Public Economics*, 88, 1011-1042.

Kneller, R., Bleaney, M. F., & Gemmell, N. (1999). Fiscal policy and growth: Evidence from OECD countries. *Journal of Public Economics*, *74*(2), 171–190.

Kneller, R., Bleaney, M., & Gemmell, N. (1998). Growth, public policy and the government budget constraint: Evidence from OECD countries. School of Economics Discussion Paper No. 98/14, University of Nottingham.

Koethenbuerger, M. & M. Stimmelmayr. (2014). Corporate deductibility provisions and managerial incentives. *Journal of Public Economics 111*, 120–130.

Lee, Y., & Gordon, R. H. (2005). Tax structure and economic growth. *Journal of Public Economics*, *89*(5–6), 1027–1043.

Lindhe, T. (2002), *The marginal source of finance*. Working Paper No. 2002:9. Department of Economics, Uppsala University.

Myles, G. (2009). Economic growth and the role of taxation OECD Economics Department Working Papers No. 713–715.

Nam, J. J., Wang, & Zhang, G. (2010). The impact of the dividend tax cut and managerial stock holdings on corporate dividend policy. *Global Finance Journal, 21*, 275-292.

Office of Tax Policy Research, *OTPR, World Tax Database*. Ann Arbor, MI: University of Michigan.

Ojede, A., & Yamarik, S. (2012). Tax policy and state economic growth: The long-run and short-run of it. *Economic Letters*, *116*(2), 161–165.

Organisation for Economic Co-operation and Development (OECD) (2010). Tax policy reform and economic growth. OECD Tax Policy Studies No. 20. Paris: Organisation for Economic Co-operation and Development.

Organisation for Economic Co-operation and Development (OECD) (2011). Tax database. www.oecd.org/ctp/taxdatabase. Paris: Organisation for Economic Co-operation and Development.

Poterba, J. M., & Summers, L. H. (1985). The economic effect of dividend taxation. In E. I. Altman, M. G. Subrahmanyam (Eds.), *Recent advances in corporate finance*. Homewood, IL: Irwin Professional Publishing.

Poterba, J. M. (1989). Tax reform and the market for tax-exempt debt. *Regional Science and Urban Economics, 19(3)*, 537-562.

Poterba, J. M. (2004). Taxation and corporate payout policy. *American Economic Review*, *94*(2), 171–175.

Prendergast, C. (1996). What happens within firms? Survey of empirical evidence on compensation policies NBER Working Paper No. 5802. Cambridge, MA: National Bureau of Economic Research.

Richardson, S. (2006). Over-investment of free cash flow. *Revenue Accounting Studies, 11*, 159–189.

Schwellnus, C., & Arnold, J. (2008). Do corporate taxes reduce productivity and investment at the firm-level? Cross-country evidence from the Amadeus dataset. OECD Economics Working Paper No. 641. Paris: Organisation for Economic Co-operation and Development.

Sendi, I., & Bellalah, M. (2010). The equity home bias: Explanations and financial anomalies. *International Journal of Economics and Finance*, *2*(2), 78–96.

Trostel, P. A. (1993). The effect of taxation on human capital. *Journal of Political Economy*, *101*(2), 327–350.

Vartia, L. (2008), *How do taxes affect investment and productivity? – Industry level analysis of OECD countries*. OECD Economics Working Paper No. 656. Paris: Organisation for Economic Co-operation and Development.

Widmalm, F. (2001). Tax structure and growth: Are some taxes better than others? *Public Choice*, *107*(3/4), 199–219.

Xing, J. (2012). Tax structure and growth: How robust is the empirical evidence? *Economics Letters*, *117*(1), 379–382.

Zodrow, G. (1991). On the traditional and new views of taxation. *National Tax Journal*, *44*(1), 497–509.

Taxation of dividend income and economic growth

MARGARETA DACKEHAG | ÅSA HANSSON

Recently, researchers have turned to analyze how the tax structure, rather than the overall tax level, affects economic performance. For instance, several papers have investigated how the taxation of corporate and individual (labor) income influences growth. The taxation of dividend income may also influence growth via its impact on investments and firm behavior. Within the academic community, there are conflicting views about the impact that taxation of dividends has on firm behavior and, hence, on economic performance. According to the "new view", the taxation of dividends does not influence the marginal cost of capital and consequently has no impact on investment decisions. According to the "old view", the taxation of dividends is distortionary and increases the cost of equity. In the "agency view", an underlying cause of this distortionary effect is principal-agency problems between management and owners, resulting in social costs due to the inefficient use of locked-in capital. To our knowledge, this paper is the first study to explore how the taxation of dividend income affects economic growth by using panel data from 1990 to 2008 for 18 European countries. We find that the taxation of dividend income negatively influences economic growth, a result that corroborates the "old view" of dividend taxation as distortionary. We do not find the same negative correlation between economic growth and taxation of labor and corporate income.

JEL classification: H21; H24; H25; O40

Keywords: Economic growth, taxation of dividend income, taxation of corporate income, taxation of personal income

THE KNUT WICKSELL CENTRE FOR FINANCIAL STUDIES

The Knut Wicksell Centre for Financial Studies conducts cutting-edge research in financial economics and related academic disciplines. Established in 2011, the Centre is a collaboration between Lund University School of Economics and Management and the Research Institute of Industrial Economics (IFN) in Stockholm. The Centre supports research projects, arranges seminars, and organizes conferences. A key goal of the Centre is to foster interaction between academics, practitioners and students to better understand current topics related to financial markets.

LUND UNIVERSITY
School of Economics and Management

LUND UNIVERSITY
SCHOOL OF ECONOMICS AND MANAGEMENT
Working paper 2016:4
The Knut Wicksell Centre for Financial Studies
Printed by Media-Tryck, Lund, Sweden 2016