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Title
The Nature and Practice of Capital Tax Competition

Permalink
https://escholarship.org/uc/item/44b579jm

Journal
2016. in Dietsch, Peter, and Thomas Rixen, eds. Global Tax Governance. 27-54

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Publication Date
2014-07-01

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Chapter 2: ***The Nature and Practice of Capital Tax Competition***

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Abstract: This paper discusses the nature and practice of tax competition, with particular attention to tax competition by national governments to seek the activities of mobile multinational firms. Multinational firms are tax-sensitive in both the location of their real economic activities and especially in their financial arrangements that seek to locate profits in more lightly-taxed jurisdictions. While aggregate capital stocks are not particularly tax-sensitive across countries, the location of profits across countries is very tax sensitive. Evidence suggests that the revenue consequences of tax competition are likely to be large, and the distributional impact of tax competition is likely considerable. This suggests several tax policy design implications, including the likelihood of substantial gains from greater international cooperation, the possibility of improvements through unilateral action, and the importance of acknowledging the role of the corporate tax in the integrity of the larger income tax system.

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I. Introduction

One of the most pressing questions of modern public finance is how to reconcile the scope of economic activity with the scope of governance. In recent decades, this reconciliation has become increasingly difficult, as the pace of international economic integration has accelerated without any commensurate surge in cooperation among sovereign governments. This disconnect is particularly visible in the international taxation of multinational corporations. As corporations become increasingly global entities, while governments do not, there are pressures for governments to compete with one another to attract both real economic activity and tax revenue. This chapter will focus on the mechanisms of such tax competition.

The first section of the chapter will consider how countries compete over the corporate tax base. Set within the context of modern tax competition theory, it will investigate types of government tax competition, including competition over statutory tax rates, the overall corporate tax burden (or effective tax rates), and preferential tax regimes. In many, but not all, contexts, such tax competition can be harmful to welfare, as countries may harm each other's capacities to collect tax revenue and fund government services. Theoretical models have been extended to include possible favorable effects of tax competition, asymmetries between countries, and other factors. This section of the chapter will also review the empirical evidence on these types of tax competition. There is substantial evidence that the path of statutory and effective tax rates has been affected by tax competition, and there is evidence of especially large tax competition effects for small and open countries.

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The second section of the chapter will consider how multinational corporations respond to tax competition. It will consider both the theoretical predictions of the literature as well as the empirical patterns of multinational firm response. There will also be some simple examples of the tax sensitivity of multinational activity taken from U.S. Bureau of Economic Analysis survey data on U.S.-based multinational corporations.[1] Evidence indicates that multinational corporations are particularly sensitive to tax differences across jurisdictions when determining where to book their income. Yet real economic activity is less responsive to tax incentives than financial decisions, a finding that is consistent with a longstanding literature in public finance.

The third section of the chapter will consider the larger consequences of tax competition, focusing on the impact on tax revenues and capital stocks across countries. Evidence indicates that tax competition has particularly large effects on government revenues. However, there is far less evidence of effects on real economic activity for OECD countries; for example, capital stocks are not shown to be sensitive to tax rate differences. In part, this insensitivity may result from tax avoidance. For example, tax avoidance by multinational firms may reduce tax burdens (and government revenues) without necessitating substantial changes in the location of economic activity. Also, the substitution between different sources of investment funding (debt-financed vs. equity-financed, portfolio vs. direct, etc.) may reduce the tax sensitivity of the *overall* capital stock.

[1] While multinational firms based in other countries may conceivably behave differently, the U.S. example allows the use of excellent survey data, which is more likely to capture the essential mechanisms at hand. Financial data suffers from differences between book and tax profit definitions as well as insufficient country-level reporting detail. Further, financial reporting incentives are different from tax incentives in important substantive ways.

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Finally, within this context, tax policy design issues will be discussed, emphasizing the benefits of international efforts, the importance of base erosion protections by national governments, and the essential importance of interactions between different features of national tax systems.

II. Tax Competition Among Governments

How do countries compete?

Wilson (1999), Fuest et al (2005), Wilson and Wildasin (2004), Zodrow (2003, 2010), and Keen and Konrad (2014) provide surveys of the tax competition literature. It has long been recognized that the international mobility of capital has the potential to generate a fiscal externality, whereby when one country raises (or lowers) its corporate tax rate, it has a positive (or negative) effect on other countries, as the mobile tax base reacts to changes in the tax rate. This raises the marginal costs of public good provision through capital taxation, implying lower levels of public good provision, and/or a shifting of the tax burden onto less mobile tax bases, such as labor or consumption, or an increase in public debt.[2]

Also, it is possible that capital is misallocated internationally, with high-tax economies experiencing a sub-optimally low capital stock, and a higher marginal product of capital (and lower marginal product of labor), than low-tax economies. In general, these models generate the expectation that increasing economic integration should be accompanied by fiercer tax competition. As integration proceeds, we expect declining

[2] The loss of tax base to other countries, alongside the associated capital mobility, generates inefficiency in the worldwide allocation of capital. It is noteworthy that some have argued that the optimal capital tax rate should be lower than the optimal labor tax rate, or even zero. However, recent studies have concluded that the optimal capital tax rate may be the same or higher than the optimal labor tax rate. See also note 19. For a full review of evidence on this question, see Clausing (2013).

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statutory tax rates, as well as lower corporate tax burdens, as countries compete for mobile investments and to host multinational firms with super-normal economic profits.[3]

However, as is often the case in economic theory, more complicated models can generate contrary results. For example, some models consider tax competition as a useful constraint on the Leviathan tendencies of governments seeking to maximize their own size rather than national welfare. Capital taxes can also be suboptimally high due to tax competition for various reasons described in Fuest et al (2005), including imperfect competition in labor markets, tax exportation with foreign firm ownership, and other political economy motivations. Other models consider the interaction between taxation and public good provision, and possible heterogeneity across countries whereby some countries specialize in producing goods that require higher levels of public good provision (and thus taxation), and other countries the opposite, so that tax differences persist over time.

As countries vary in size or economic openness, this can also generate disparate tax rates in tax competition models, since smaller and/or more open countries face more elastic capital supply curves and thus choose lower tax rates in response. Baldwin and Krugman (2004), Haufler and Wooten (1999), and Borch and Pflüger (2006) have emphasized that agglomeration effects may help insulate some nations from the effects of tax competition, allowing them to set higher tax rates without losing capital.

A particularly relevant extension of this literature considers the interaction between real capital mobility and tax avoidance practices that allow corporations to move

[3]Economic integration could also generate lower tax rates across integrated countries due to other processes, aside from competitive pressure to attract mobile tax bases. For example, yardstick tax competition may lead countries to follow each others' tax policy choices, or ideological or economic similarities across integrated countries may generate similar tax policy choices.

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income without commensurate movement in real activity. As Hong and Smart (2010) model, tax avoidance can reduce tax burdens on real capital in high-tax countries, increasing investment in high-tax countries over the level that would prevail absent the possibility of tax avoidance. Simply put, if multinational corporations can move the income without moving the underlying activity, income shifting reduces the tax sensitivity of investments in a way that benefits high-tax countries. However, income shifting behavior makes the tax base more sensitive to tax differences across countries, even as real activities are less sensitive to tax differences.

The Hong and Smart (2010) model implies a different path of tax rate changes under tax competition, where statutory and effective tax rates could rise with the introduction of tax havens. This contrasts with other models, such as Slemrod and Wilson (2009), where the elimination or reduction of havens unambiguously improves welfare in non-haven countries.

Income shifting between the corporate and personal tax base (or between income in capital and labor form) also has implications for capital tax competition, since there are incentives, e.g., to characterize labor income as capital income as capital tax rates fall relative to labor tax rates. Gordon and Slemrod (2000), Gordon and Mackie-Mason (1995), Pirttila and Selin (2011), and Thoresen and Alstadsaeter (2010) examine these considerations. Like income shifting more generally, this can confuse the revenue effects associated with corporate income tax changes. If a country lowers its corporate tax rate, for example, it may be compensated by increased income shifting from abroad (or decreased outward shifting), which will attenuate negative effects on government revenues. There may also be a greater incentive (or lesser disincentive) to earn income in

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corporate form, also increasing corporate revenues. In this later case, the additional corporate tax revenue comes at the expense of reductions in the personal income tax base.

Finally, governments increasingly compete with respect to tax regime characteristics, although this facet of tax competition is not as well-developed in the literature. Just a few examples of such tax competition include the U.S. check-the-box rules, discussed in Altshuler and Grubert (2005). These rules allow some entities to be disregarded for tax purposes, facilitating tax avoidance through chains of ownership that can even generate "stateless" income, as described by Kleinbard (2011). Other examples include the recent U.K patent-box, following those in Belgium, Luxembourg, and the Netherlands, and the favorable rules regarding holding companies in the Netherlands. As noted above, this sort of tax competition reduces government revenue in high-tax locations, but it may provide a silver-lining, by lessening the real response of investment to statutory tax rates.

What is the experience of international corporate tax competition?

First, consider the path of corporate tax rates in recent decades, a time that has been marked by dramatic increases in international economic integration.[4] Figure 1 shows the path of OECD statutory tax rates at the central government level. There is a clear decline in the average corporate tax rate, from 41% in 1981 to 23% in 2014. If one weights this series by the GDP of the OECD countries, the decline is less dramatic, though still present, indicating that smaller economies are lowering their corporate tax rates to a greater degree than are larger economies.

[4] For an overview of relevant measures of increasing international integration, see Clausing (2013).

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This trend also extends to effective tax rates, assuming the foreign affiliates of U.S. multinational firms are representative of larger trends. Figure 2 shows the effective tax rates paid by these affiliates; it is the ratio of their actual foreign taxes paid (as a group) to their income (before foreign tax is paid) for the countries in the sample; this includes about 50 foreign countries. Effective tax rates decline steadily over this period, from 33% in 1983 to 18.5% in 2011. Again, it is the case that large economies have higher effective tax rates. If one regresses the effective tax rate on a time trend and GDP, one finds that effective tax rates are higher for large economies, and tax rates decline over time during this period.

There is evidence in the literature of tax competition pressures on tax rates. Strategic interaction in corporate tax rate setting is found by Altshuler and Goodspeed (2014), who examine OECD countries between 1968 and 2008. Devereux et al (2008) also find evidence of strategic corporate tax rate setting for OECD countries between 1982 and 1999. However, Stewart and Webb (2006) find that there is little evidence of corporate tax burden convergence for OECD countries, although there is some convergence among smaller groups of countries.

Not all countries are affected by tax competition pressures equally, and evidence indicates that smaller and more internationally integrated economies are more likely to set lower tax rates. For example, Mutti (2003) considers the determinants of corporate tax rate changes over the period between 1984 and 1996; he finds that small countries and countries with higher initial rates are more likely to see larger reductions in their corporate tax rate. Azemar, Desbordes, and Wooten (2013) also emphasize the role of country size, which is important due to market access considerations.

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Bretschger and Hettich (2002) and Rodrik (1997) find evidence that greater international integration is associated with lower corporate tax rates. Adam, Kammas, and Lagou (2013) consider a meta-analysis of how globalization measures affect capital taxation measures; studies find negative relationships between measures of globalization flows and capital tax rates.

Davies and Voget (2008) consider the role of European Union expansion in fueling tax competition pressures, and they find that EU members respond more to the tax rates of other members, focusing on the period from 1980 to 2005. Clausing (2008) has a similar finding. Winner (2005) considers how tax competition pressures affect the balance of tax burdens across capital and labor. They find that more economically integrated countries have lower capital tax burdens relative to labor tax burdens, as do smaller countries. They focus on OECD countries between 1965 and 2000.

Many of the above studies consider the setting of corporate tax rates in response to tax competition pressures. Still, importantly, tax competition may also affect how much revenue a government receives for any particular tax rate, and countries may not be symmetric in this regard either. For example, a smaller or more open country may experience more tax base erosion from a high corporate tax rate than would larger or more closed countries. This part of the tax competition evidence will be discussed in Section IV, when the consequences of tax competition are addressed.

III. How do Multinational Firms respond to Government Tax Competition?

In general, firms are expected to respond to tax differences across countries by making tax-sensitive choices regarding the location of their economic activities. For

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example, general equilibrium models of corporate tax incidence in an open economy suggest that capital should move from high-tax locations to low-tax locations, equalizing the after-tax return to capital across countries. Due to the tax differences between countries, higher-tax countries should experience lower capital stocks and a lower marginal product of labor, and thus lower wages, in comparison with low-tax countries. These sort of theoretical mechanisms are described in the work of Harberger (1995, 2008), Randolph (2006), and Gravelle and Smetters (2006). Still, as Gravelle (2010) notes, this mechanism need not imply that labor bears the full burden of the tax, since this will depend on several key economic parameters, and the best estimates of these parameters from the literature suggest that capital will still bear a substantial portion of the burden. Further, other factors are omitted from these models that may also alter their conclusions, as explained in Clausing (2012). These factors include residence elements of the tax, dynamic considerations, the possibility of super-normal profits, and effects on bargaining, among other things.

The tax response of the real activities of multinational firms may also depend on the possibilities for tax avoidance. In particular, if multinational firms are adept at moving economic profits across jurisdictions without a commensurate movement of the underlying economic activity, this may reduce the tax responsiveness of real economic activities. Multinational firms can shift income across locations by a variety of methods. For example, they can manipulate transfer prices on intrafirm transactions in order to make affiliates in low-tax countries appear more profitable than those in high-tax countries. This can be done by overpricing items that will be revenues for low-tax country affiliates or costs for high-tax country affiliates, while underpricing items that

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will be revenues for high-tax country affiliates or costs for low-tax country affiliates. Multinational firms can also alter the structure of affiliate finance so that interest deductions are taken in high-tax countries but interest income is earned in low-tax countries. Finally, multinational firms can create complicated chains of ownership so that income becomes "stateless income", not taxable in any jurisdiction.[5]

There is a great deal of evidence that suggests that multinational firms are tax-sensitive in their economic decisions. De Mooij and Ederveen (2003, 2008) and De Mooij (2005) provide surveys of some of this literature; there are dozens of studies demonstrating the tax sensitivity of multinational firm behavior. Still, even simple figures illustrate that financial decisions appear to be more tax responsive than real economic decisions. As an example, compare Figures 3 and 4, which show data for affiliates of U.S.-headquartered multinational corporations in 2011. Of the ten destinations with the highest levels of foreign profits, seven are countries with effective tax rates less than 6.5%. These countries together account for 46.5% of all foreign profits, yet they only account for 5% of total foreign employment. And no wonder, since these are tiny countries, not economic powerhouses.[6]

On the other hand, Figure 4 shows the largest employment countries for affiliates of U.S. multinational firms, and the top ten countries do not include a single country with a tax rate below 6.5%. Instead, these countries are the obvious large-market countries where one would expect U.S. multinational corporations to have operations abroad for economic purposes.

[5] Kleinbard (2011) discusses stateless income.
[6] Only the Netherlands has a population in excess of 10 million, and the *combined* population of these countries is less than that of Spain or California.

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Tables 1 and 2 present a more sophisticated econometric analysis of the location of U.S. multinational firms' employment, sales, property plant and equipment, assets, and income. The data employed are from U.S. Bureau of Economic Analysis (BEA) surveys of U.S. multinational corporations over the period 1983 to 2011. The analysis in Table 1 models the scale of economic activity (employment, sales, plant/property/equipment, assets, and income) as depending on the size of the economy (measured by GDP), the average income of the population (measured by GDP per-capita), the distance between the country and the United States, and the effective tax rate paid by U.S. affiliates. In Table 1, employment and sales do not show a statistically significant relationship with the effective tax rate, and property, plant and equipment are unexpectedly *positively* related to tax rates, but both assets and – especially – income, are negatively related to effective tax rates.

Table 2 also includes country-specific fixed effects. Country fixed effects are important, since country-specific influences are surely essential determinants of multinational firm activity, and econometric tests indicate that their inclusion is warranted. However, in these specifications, the relationships between effective tax rates and the dependent variables (which measure multinational activities) are estimated based solely on variation in tax rates *within* countries over time, since *between* country variation in tax rates (and other matters) are captured by the country-specific fixed effects. In these specifications, real economic measures (employment, sales, and property plant and equipment) are negatively related to tax rates, but assets and income show much larger negative tax effects. For example, a one percentage point increase in the effective tax rate reduces employment by 0.4%, but it reduces reported gross income by 2.4%.

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The evidence in both tables is consistent with a long literature in the field of public finance that has emphasized a *hierarchy* of behavioral response to taxation, whereby timing and financial decisions are more tax-sensitive then real decisions about levels of economic activity.[7] While some measures of economic activity are not particularly tax sensitive, profit rates are *very* sensitive to tax rate differences across countries, as the regressions in Tables 1 and 2 suggest.

Further, there is also ample evidence that multinational corporations make use of special regimes that are offered by countries for certain types of income. Mintz and Weichenrieder (2010) provide a thorough discussion and related evidence on chains of ownership. Joint Committee on Taxation (2010) also provides concrete examples of U.S. based multinational corporations and their tax avoidance strategies. Indeed, many of the countries with special tax regimes are prominent in the list of top income countries for foreign affiliates of U.S. based multinational corporations, as shown in Figure 3.

IV. The Consequences of Tax Competition

There are two essential consequences of tax competition that are likely to worry governments. First, low-tax countries may attract mobile economic activity at the expense of high-tax countries, resulting in inefficient capital allocation, and changing the pattern of capital returns and wages across countries. Second, the tax base itself is mobile, causing revenue loss in high-tax jurisdictions relative to low-tax jurisdictions, creating concerns about fiscal externalities and possible under-provision of public goods.

[7] Slemrod and Bakija (2008) and Auerbach and Slemrod (1997) summarize a vast body of research on taxation that suggests this hierarchy of behavioral response.

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Consequences for Economic Activity

As discussed above, the literature gives substantial support to the idea that foreign direct investment is tax-sensitive.[8] But what resulting effect does this have on the pattern of investment and employment across countries? Even though foreign direct investment is tax-sensitive, the resulting capital stocks may be less tax-sensitive due to several considerations.

For example, clientele effects may be important. Desai and Dharmapala (2009) find evidence of substitution between foreign portfolio investment and foreign direct investment in response to tax incentives. This implies that countries that receive more foreign direct investment due to low corporate tax rates, e.g., may receive less foreign portfolio investment as the returns to capital are driven down. And, in a similar fashion, increased foreign portfolio investment may compensate high-tax countries from reduced foreign direct investment.[9]

Indeed, the *financing* of particular investments may be more affected by tax incentives than the *overall level* of investment. Corporate taxation actually subsidizes debt-financed investments in many cases, so a higher corporate tax rate may cause domestic investment to be disproportionately debt-financed.[10]

In general, the *type* of investment (portfolio versus direct, debt versus equity financed, etc.) may be far more sensitive to corporate tax treatment than the overall *level*

[8] Again, see De Mooij and Ederveen (2003, 2008) and De Mooij (2005) for surveys.
[9] While both foreign direct investment and foreign portfolio investment affect the aggregate capital stock of the economy in a similar way, there may be important differences in these types of investment in certain contexts. For example, foreign portfolio investment may respond more quickly to changes in macroeconomic conditions, exacerbating the volatility of international capital flows.
[10] This is due to accelerated depreciation rules and the deductibility of debt, resulting in implicit subsidization of debt-financed investments.

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of investment that determines the resulting capital stock. If corporations are mere intermediaries in global capital markets in which a wide assortment of investors with different tax treatments invest, tax policy changes could affect the ownership and financing patterns of assets more than they affect the aggregate level of investment in different countries.

Somewhat surprisingly, there is little cross-country evidence on the relationship between corporate tax variables and *overall* investment or capital stocks outcomes, despite the aforementioned large literature on the relationship between corporate taxation and foreign direct investment. What little cross-section evidence exists is far from conclusive.[11]

In my own investigation, I have found no systematic relationship between capital/labor ratios and corporate tax rates in OECD countries over the previous 30 years. Tables 3 and 4 excerpt tables from Clausing (2012) that consider the relationship between corporate tax rate measures (considered a variety of ways) and capital formation (Table 3) and capital/labor ratios (Table 4), over the period 1981-2011.[12]

In Table 3, the dependent variable is the ratio of gross fixed capital formation to GDP. The regressions consider the impact of corporate tax variables, considering the

[11] Djankov et al (2010) note a literature, to which they contribute, that suggests a relationship between corporate taxation and investment, but other studies do not typically use cross-country analysis. However, they employ a cross-section of 85 countries in 2004. They find statistically significant relationships between both statutory and effective tax rates and foreign direct investment; effective tax rates, but not statutory rates, have a statistically significant effect on overall investment. Yet the influence of effective tax rates on investment is still subject to caveats: (i) the absence of time series variation makes it impossible to control for country-specific fixed effects, (ii) the effect loses statistical significance when a complete set of control variables are added, and (iii) the effect loses statistical significance if Bolivia is excluded from the analysis, as noted by Gravelle and Hungerford (2011).

[12] The table descriptions in the text are also excerpted from this source. The source provides all details regarding data set construction and estimation. The country and time period selection were a result of data constraints; the most complete data are available for OECD countries over this time period.

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average of the most recent six years (the current year and the five previous) of *relative* tax rates in comparison to the average of OECD countries. The specifications control for the growth of real GDP from the prior year and the unemployment rate, both proxies for the state of the macroeconomy. In addition, there are both country-specific fixed effects and time-specific effects.[13]

Columns (1), (2), (3), and (4) differ only by considering the influence of four different tax rate measures: the combined statutory rate, the central government statutory rate, the effective tax rate, and the corporate revenue/GDP ratio. Surprisingly, the only statistically significant tax coefficients are *positive*, for both the average relative statutory tax rate, and the average relative corporate tax revenue ratios. This is a puzzling finding, and I consider alternative specifications without changing the main results in Clausing (2012).

Table 4 examines specifications that consider how capital/labor ratios depend on corporate tax variables, controlling for the real purchasing power parity (PPP) adjusted GDP per-capita of countries (in order to account for the fact that capital/labor ratios tend to be higher in higher income countries), country fixed effects, and time fixed effects. Again, columns (1), (2), (3), and (4) differ only by considering the influence of the four tax rates examined above. In the case of the central government statutory rate, there is a statistically significant negative relationship between tax rates and the K/L ratio; however for the other tax rate variables, the coefficients are statistically indistinguishable from zero.

[13] The inclusion of such effects allows one to control for features of particular economies or years that may alter the typical level of the dependent variable.

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What is one to conclude from the absence of clear negative effects of corporate taxation on the capital stock? It is certainly plausible that some *types* of investment or some *types* of investment finance are discouraged by high levels of corporate taxation, but that other types of investment and investment finance at least partially take their place. Such a substitution could offset much of the aggregate impact of corporate taxation on the capital/labor ratio and thus on wages.

Finally, as demonstrated in Figures 3 and 4 above, there has been an increased divergence between the location of economic activity (such as employment and sales) and the location of income for tax purposes. This divergence reduces the effects of relative corporate tax rates on investment, since agile firms can move income without commensurate movements of investment and jobs. Indeed, many of the most global companies have become increasingly adept at such income shifting.[14] If firms can respond to tax differences among countries through *financial* or *organizational* decisions, this will lower the tax sensitivity of *real* activity, thus reducing tax-induced impacts on the capital stock and wages. This is a silver lining of tax avoidance.

Consequences for Revenues

Tax competition likely has important revenue effects for high-tax and low-tax countries, but disentangling the precise effect on government revenues can be difficult. For example, in general, OECD countries have seen an increasing share of corporate tax revenue as a fraction of GDP, despite lowering corporate tax rates. This may be due to

[14] The tax payments of the largest U.S. corporations support the idea that some firms are far more global than others, and thus more adept at lowering their effective U.S. tax burden below the statutory rate. Helman (2009) and Citizens for Tax Justice (2011) consider data from financial statements, demonstrating that effective tax rates vary widely. Globally integrated firms, like GE, Hewlett-Packard, IBM, and Procter and Gamble, have far lower effective tax rates than more domestic firms, like Walmart and CVS, which have higher effective tax rates.

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several confounding considerations: increasing corporate profitability, shifting of income from the personal tax base to the corporate tax base as corporate tax rates fall, and classic fiscal externality effects.

In Clausing (2007, 2008), I estimate the relationship between the corporate tax rate and corporate revenues for OECD countries. This work models a parabolic relationship between tax rates and revenues, and the revenue maximizing rate is found to decrease as countries are smaller and more integrated with the world economy. European Union membership, an indication of greater international integration, also decreases the revenue-maximizing rate.[15] These analyses demonstrate one possible mechanism for why closer economic integration fuels tax competition pressures. At high tax rates, economic integration increases the benefit associated with lower corporate tax rate choices, since the tax base is more responsive.

It is also likely that income shifting has large revenue costs for high tax countries. Simply put, if income is booked in a tax haven, it is no longer booked in a higher-tax jurisdiction, and that will reduce revenues accruing to high-tax governments. Such revenue losses can be quite large. In Clausing (2009, 2011), I estimate that income shifting by multinational firms reduces U.S. government corporate tax revenue by $60 to $90 billion in 2008; given recent escalations in innovative international tax avoidance, this cost is likely higher today. This estimate is derived by using regression analysis to consider the impact of country tax rate differences on profit rates. These regression results are then used to estimate how profit rates would change absent tax differences,

[15] Of course EU membership also entails other effects as well, and the European Court of Justice has a large impact on the ability of member states to freely adopt policy changes.

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and then some fraction of the resulting lower foreign profits are attributed to the U.S. tax base.[16]

Personal Capital Income Mobility and Its Consequences

Corporate income is just one form of capital income; other forms of capital income are also highly international mobile and sensitive to tax competition pressures. As Zucman (2014) notes, corporate taxes typically account for about 1/3 of capital income taxes, with the remaining 2/3 comprised of personal capital income taxes and property taxes. Increasing international economic integration has facilitated the mobility of personal capital income, as tax avoidance and evasion move personal capital income toward low-tax locations.

Unfortunately, data constraints make the tracking of offshore capital income particularly vexing. However, estimates from various sources suggest that the scale of personal capital tax avoidance and evasion is both large and increasing. Zucman (2014) calculates that, in Switzerland alone, $2.5 trillion is held by foreigners in Swiss accounts. Zucman (2013) uses balance of payments data to generate a lower-bound estimate of the size of global wealth held in tax havens, concluding that 8% of total wealth (about $8 trillion) is located in tax havens. This number is quite similar to the $9 trillion figure calculated by Boston Consulting Group (2014), based on interviews with wealth managers.

Despite some policy efforts to reduce offshore tax evasion, including G-20 efforts to bring an end to bank secrecy, evidence indicates that the problem has increased in

[16]The fraction is 32% in 2008, and it is based on the share of the foreign affiliates' intrafirm transactions that occur with the United States. Full details of these calculations are provided in the original papers. Gravelle (2013) reviews other studies on the magnitude of the income shifting problem, and concludes that U.S. revenue losses are likely in the tens of billions, though there is uncertainty regarding the precise number.

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recent years. Johannesen and Zucman (2014) indicate that bank secrecy is still alive and well, since offshore assets have been redirected in form and destination to circumvent such policy efforts. Zucman (2014) suggests that the revenue consequences of offshore wealth are quite large, with a total revenue loss for high tax countries approaching $200 billion.

Consequences of Tax Competition

Since capital income is likely far more mobile than labor income, and also more highly concentrated, tax competition will also have distributional impacts. There is substantial concern regarding the indisputably large increases in income inequality in recent decades. In the United States, for example, the U.S. Census Bureau indicates that the share of income received by the top 5% of households has increased by five percentage points between 1980 and 2010. Work by Alvaredo et al. (2013) indicates that these trends are particularly dramatic among the top 1% of incomes in the United States. Also, this development is not unique to the United States, although it is particularly dramatic in the U.S. case.

Also, the distribution of wealth is typically much more skewed than the distribution of income. In the United States in 2010, the top 5% of households receive 21% of income, but they receive 85% of capital gains and 65% of dividends.[17] Also, capital income is becoming more concentrated over time. For example, the highest income 400 taxpayers received 16% of all long-term capital gains in 2009, and this share

[17] Calculations are from data of the Tax Policy Center. See http://www.taxpolicycenter.org/T09-0490.

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has been increasing since the data were first collected (in 1992), when the share of the richest 400 taxpayers was about under 6% of all long-term capital gains.[18]

As Piketty (2014) indicates, recent data in many countries point to an increasing importance of capital income. In the United States, three separate data sources show declining labor shares in national income in recent decades, as documented in Jacobsen and Occhino (2012). Data from the U.S. Bureau of Economic Analysis show labor's share declining from about 67% to about 64% over the prior decade, data from the Bureau of Labor Statistics show the share declining from about 63% to 58% (from the early 1980s to recently), and data from the Congressional Budget Office show labor's share of income decreasing from 75% in 1979 to about 67% in 2007.

This context heightens worries about tax competition, since capital income is typically deemed to be far more mobile than labor income. If countries respond to tax competition pressures by lightening the burden on capital income relative to labor income, this will likely exacerbate attempts to address income inequality through the tax system. Indeed, recent tax policy changes in many countries have tended to lower corporate and capital tax rates while raising tax burdens on labor and consumption.[19] Haufler, Klemm, and Schjelderup (2009) and Winner (2005) provide related evidence.

[18] See data summarized in Burman (2012), Figure 2.

[19] This raises larger questions about the optimality of capital taxation more generally. While early models often deemed capital taxation undesirable, newer models with more realistic features have reached the conclusion that capital should not be taxed any more lightly than labor. Examples are Conesa, Kitao, and Krueger (2009), Piketty and Saez (2012), and Farhi, Sleet, Werning, and Yeltekin (2012). See Clausing (2013) for a discussion of these papers.

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V. Tax Competition and Policy Design Issues

The nature and practice of capital tax competition has important implications for tax policy design. This section will consider implications for international efforts at greater tax policy cooperation, implications for country decisions about corporate tax rates, rules and regimes, and implications regarding the interactions between the corporate and personal tax bases.

International Efforts

The presence of fiscal externalities across countries presents a powerful argument for greater international cooperation to address such fiscal spillovers. While there are few examples of supranational government entities capable of mediating competing concerns across countries, there is still a large potential for greater international cooperation to improve economic outcomes.

Presently, there are several efforts in this direction. In response to pressing concerns about income shifting in OECD countries, evidenced by prominent hearings in the U.S. Congress and the U.K. Parliament, as well as priority in recent G-8 and G-20 meetings, the OECD has launched the BEPS project, where BEPS stands for base erosion and profit shifting. The OECD is in the process of making concrete action plan recommendations to help countries address the problems of corporate profit shifting; these will be released in phases over 2014 and 2015. This process is discussed in more detail later in this volume, in Eccleston and Smith (2015). The IMF has also recently issued a staff report on "Spillovers in International Taxation" that considers the nature of such fiscal spillovers and, in particular, how they affect developing countries. While these are welcome developments, there is not a consensus about their ultimate

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effectiveness in an environment where tax planners are often several steps ahead of new regulatory solutions.

Another mode of indirect international cooperation is the spread of policy ideas, as individual country "best practices" may be adopted by follower countries. Individual country efforts at corporate tax base protection vary widely. Some countries' rules are much stricter than others, and much can be learned from a more detailed examination of country experiences with base protection rules.

One supranational effort worthy of mention is the European Union attempt to develop a common consolidated corporate tax base (CCCTB). While this proposal is far from implementation, it is an important effort, focused on international cooperation about the definition of the corporate tax base. Under the CCCTB, it is envisioned that companies would divide their European tax base among member states according to a system of formulary apportionment. This would eliminate income shifting among European Union member country tax bases, since the tax liability would be based on real factors (destination of sales, physical assets, and employment/payroll), rather than where income is booked. However, the CCCTB's reach would be limited to the "water's edge" of Europe, and it was designed to be optional for companies.[20] Important related issues are discussed in this volume within Avi-Yonah (2015).

There are also other innovative proposals for greater international cooperation on tax policy, including Rixen (2015) within this volume. Rixen envisions the creation of an

[20] It is also possible that individual countries adopting formulary apportionment unilaterally could lead to strong incentives for other countries to adopt formulary apportionment. The country(ies) adopting formulary apportionment (FA) would become tax havens from the perspective of other countries still using separate accounting, since income could be booked in FA countries without affecting the resulting tax liability in these FA countries. These incentives are discussed in greater detail in Avi-Yonah and Clausing (2008).

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International Tax Organization modeled in part after the World Trade Organization. An International Tax Organization could provide a forum for negotiations regarding international tax rules and work to resolve disputes regarding competing revenue claims and harmful tax competition.

Implications for National Governments' Tax Policy Choices

In the presence of increasing international economic integration and the resulting tax competition pressures, countries may be more tempted to lower their corporate tax rates, as lower rates will be rewarded by increased inward income shifting (or decreased outward income shifting). As documented above, there is substantial evidence that policy-makers respond to these incentives.

As discussed above, outward income shifting may alleviate concerns regarding the *real* effects of high corporate tax rates, but there are still substantial concerns about tax base erosion. Measures such as strong CFC (controlled foreign corporation) laws and earnings stripping laws may reduce the ability of multinational firms to shift income abroad with impunity. Indeed, Markle and Robinson (2012) find that countries with stronger CFC laws reduce the use of tax havens. Also, governments have substantial authority in their regulatory choices. For example, Shay (2014) describes measures that the U.S. Treasury could take without additional legislation to stem income shifting. In fact, the U.S. "check-the-box" rules were also an outcome of regulatory change, rather than legislation.

One possible concern regarding provisions that attempt to stem income shifting is that such measures may perversely heighten real responses to tax rate differences across countries. If mobile corporations can no longer move the income without moving the

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underlying activity, they may be more tax-sensitive in their real economic decisions about investment and employment. While this is a valid concern, one should also recall the longstanding finding in the public finance literature about the greater responsiveness of financial measures (than real measures) to tax incentives. This hierarchy of behavioral response is discussed in Section III (and note 7).

Some limited evidence is also provided by the U.S. state experience under formulary apportionment, discussed in Clausing (2014). Income shifting is limited under formulary apportionment, since the shifting of paper profits between states does not change tax liabilities under formulary apportionment; instead, the tax base is simply apportioned to states based on their *national* income and formula factors that reflect the underlying economic activities in each state, typically sales, assets, and payroll. However, while income shifting is reduced under formulary apportionment, as found in Mintz and Smart (2004), one might be concerned about the tax responsiveness of the formula factors themselves. Still, using the most comprehensive data and methods available, Clausing (2014) finds that there is no evidence of large tax responses of formula factors to tax burden differences among U.S. states. While the applicability of the U.S. state experience is limited, this nonetheless provides some reassuring evidence about the tax sensitivity of real economic decisions.[21]

[21] On one hand, U.S. states typically have lower tax rates than national economies; U.S. state corporate tax rates average 7% in recent decades; this may lower the tax sensitivity of real factors. On the other hand, tax competition pressures are likely to be particularly heightened *within* countries, since competition is fiercer due to greater information flows, common currencies, and common markets. Also, firms are likely more footloose within countries, since relocation across state borders is easier and less complicated than international relocation.

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Implications for the Personal Income Tax

Some have suggested that more of the capital tax burden should be put on individual taxpayers instead of corporations. For example, Altshuler, Harris, and Toder (2010) discuss the option of raising the tax rate on personal dividends and capital gains while lowering the corporate tax. This change would lessen international income shifting incentives, if it is more difficult for individuals than corporations to avoid capital taxes. Still, this assumes that corporations have more opportunities for tax avoidance than individuals do. While likely, one should remember that individual income tax avoidance and evasion is not trivial. As discussed above, Zucman (2013) estimates that 8% of world financial wealth of households is held in tax havens, most of it unrecorded.

Also, if all taxation is done at the personal level, capital income that is held tax-free in pensions, endowments, or non-profits would go untaxed. In the United States, Gravelle and Hungerford (2011) note that over 50% of individual passive income is held in tax-exempt form through pensions, retirement accounts, life insurance annuities, and non-profits.

More generally, the corporate tax protects the integrity of the individual income tax system, since if the corporate rate falls much below the top individual rate, the corporate form can provide tax-sheltering opportunities.[22] As discussed in Section II, there is substantial evidence of income shifting between the corporate/non-corporate tax bases, and this may confound estimates of the revenue effects of tax rate changes. For example, lower corporate tax rates may generate more business activity in corporate

[22] In particular, depending on the relative tax rates of the top personal income tax rate, the corporate tax rate, and the tax rates on dividends and capital gains, business activity may be relatively tax advantaged in corporate or non-corporate form. This point is explained clearly in Jane G. Gravelle and Thomas Hungerford's "Corporate Tax Reform: Issues for Congress" CRS Report. December 16, 2011.

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form, reducing the revenue cost of the lower rate with respect to the corporate tax base, but simultaneously generating parallel revenue losses in the personal income tax base.

VI. Conclusion

Theory predicts that national governments are likely to impose fiscal externalities on each other when setting tax rates on capital, since a relatively lower tax rate will lure mobile capital away from high-tax jurisdictions. Indeed, there is ample evidence that countries behave strategically in their tax rate setting, that smaller and more open economies choose lower tax rates than their larger or more closed counterparts, and that corporate tax burdens, measured by both statutory and effective tax rates, have fallen substantially in recent decades, a time characterized by dramatic increases in international economic integration. Countries have also engaged in tax competition by creating favorable tax regimes, whereby some types of mobile income are more lightly taxed, or whereby tax avoidance is facilitated.

Indeed, multinational corporations are tax-sensitive in both the location of their real economic activities, such as investment and employment, as well as the arrangement of their global financial affairs in order to locate income in more lightly-taxed jurisdictions. Evidence suggests that this financial responsiveness to tax rate differences exceeds real responsiveness; tax competition has far more substantial consequences for government revenues than it does for the underlying capital stocks of countries. In part, the smaller effects on capital stocks are due to the globally integrated capital markets themselves. Tax rate differences between countries are more likely to affect the

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ownership patterns and financing of the capital stock in particular countries than the *overall level* of the capital stock, since investment can take many forms.

However, the revenue consequences from tax competition are likely large, and this has substantial implications for the distribution of tax revenues across countries. There are also important implications for the distributional effects of the underlying tax systems. To the extent that tax competition makes it more difficult to tax capital, it also makes it more difficult to address increases in income inequality through the tax system. Capital income is far more concentrated than labor income, and taxpayers at the upper end of the income distribution are likely to have more flexibility in how they characterize their income.

This overview suggests several implications for tax policy design. First, there are likely substantial gains from even modest international cooperation and harmonization in elements of capital tax policy. In particular, many countries may benefit from measures that stem corporate tax base erosion, measures that align elements of the corporate tax base definition, and measures that reduce compliance and administrative burdens by clarifying the taxable location of corporate and capital income. Progress can be made through supranational governance in the case of the European Union, through international organizations that foster cooperation, or even through the spread of best practices in tax policy design across countries.

Indeed, countries can take substantial measures on their own to stem tax base erosion. For example, there is a large degree of heterogeneity regarding the strength of CFC laws, and countries with stronger CFC laws are likely to be more successful in

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stemming tax avoidance and the use of tax havens. Where there is political will, there is also much that can be done with legislative and regulatory measures.

Finally, it is important to remember the connection between different parts of the tax base. For example, cutting corporate rates in isolation may lose more revenue than it appears, if it causes the corporate sector to grow relative to the non-corporate sector, since gains in the size of the corporate tax base will be offset by losses in the size of the personal tax base. Also, placing more of the tax burden on individuals is not a panacea, since individuals are also likely to engage in tax avoidance, which is especially feasible for the most wealthy individuals that hold the vast majority of capital assets. Further, a large part of capital income is held in tax-exempt form by, for example, pensions, endowments, and retirement accounts. Since the corporate tax is an important back-stop to the individual income tax, taxing corporate income fairly and efficiently is an essential goal.

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Acknowledgements: I would like to thank Vladislav Mankov for his capable research assistance.

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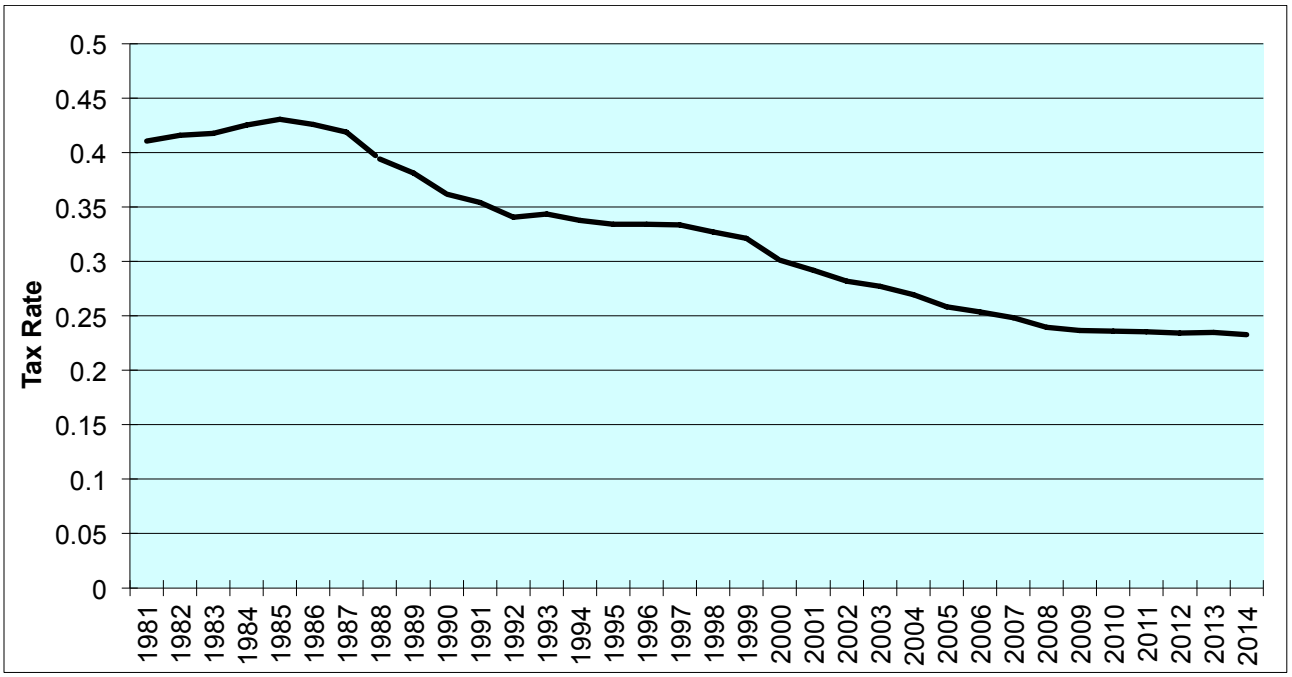
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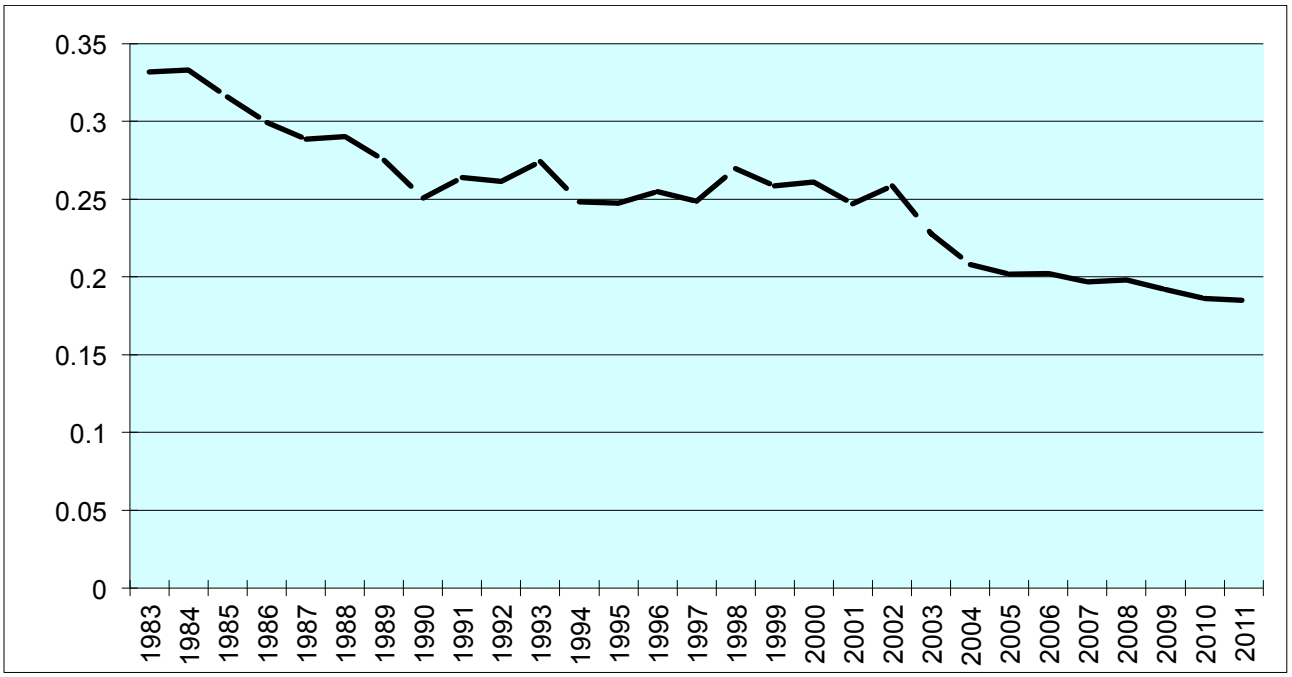
Figure 1: Statutory Corporate Tax Rates for Central Governments, Average, OECD Countries



Source: OECD Revenue Statistics Database

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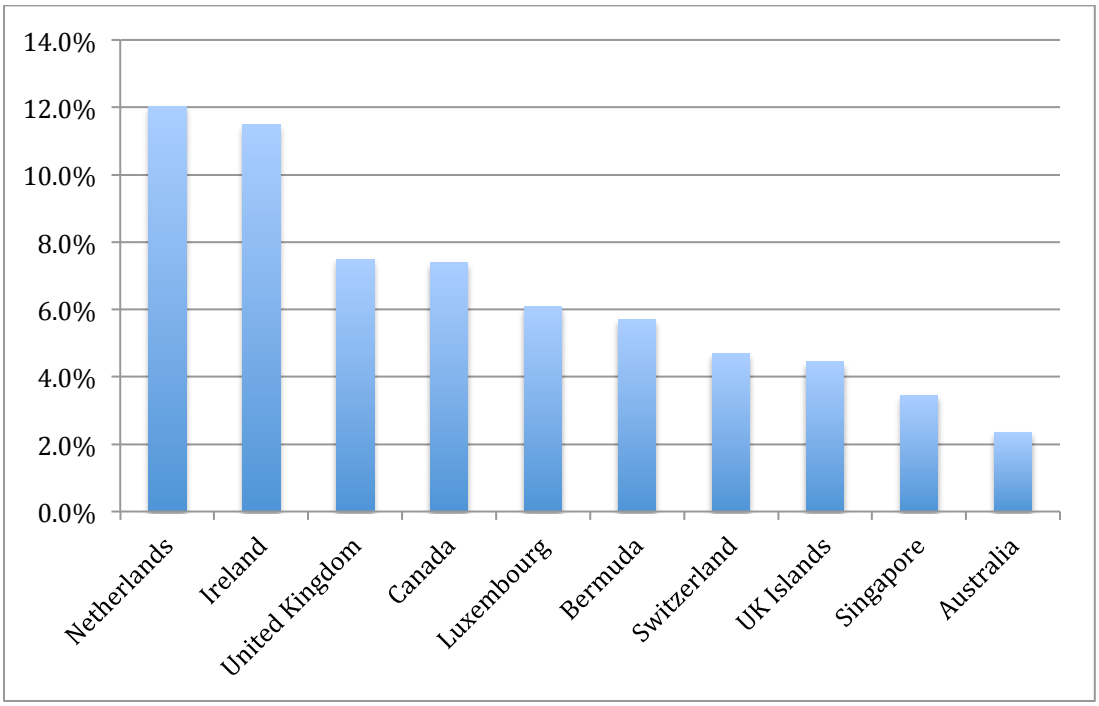
Figure 2: Average Effective Tax Rates for Foreign Affiliates of U.S. Multinational Firms (across 50 countries)



Source: U.S. Bureau of Economic Analysis Survey Data on Operations of U.S. Multinational Firms

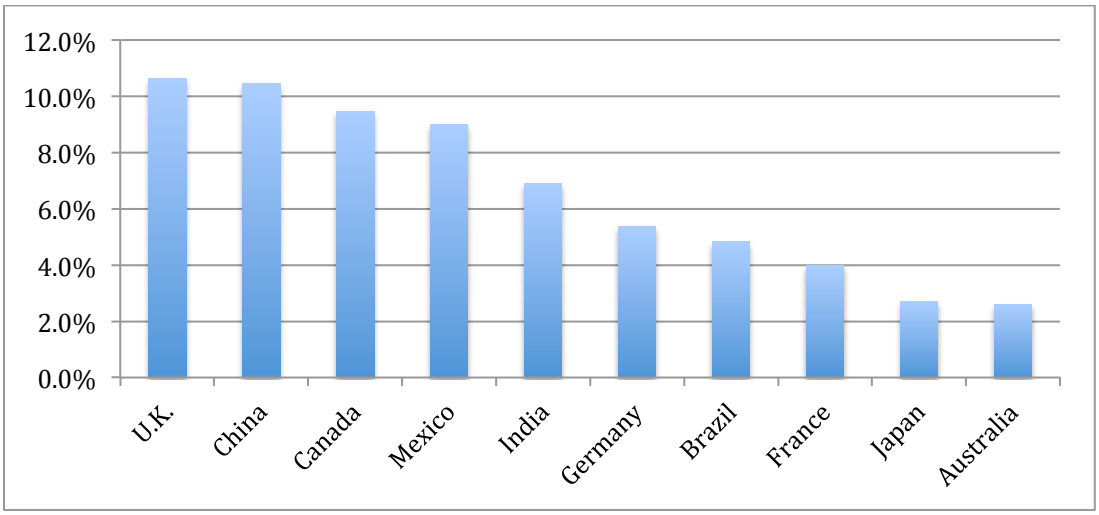
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Figure 3: Top Income Countries for affiliates of U.S. Multinational Firms, 2011 (shares of total foreign profits of affiliates abroad)



Note: Seven of these countries have particularly low effective tax rates; for Netherlands, Ireland, Luxembourg, Bermuda, Switzerland, the UK Islands, and Singapore, effective rates are less than 6.5% in 2011. Data are from the U.S. Bureau of Economic Analysis.

Figure 4: Top Employment Countries for affiliates of U.S. Multinationals, 2011 (shares of total foreign employment of affiliates abroad)



Note that none of the top employment countries have effective rates as low as the 6.5% threshold of Figure 3. Data are from the U.S. Bureau of Economic Analysis.

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Table 1: Regressions Explaining Activity Levels, 1983-2011

	(1) ln(empl)	(2) ln(sales)	(3) ln(ppe)	(4) ln(assets)	(5) ln(grossinc)
ETR	0.212	-0.000880	0.569*	-1.608*	-1.905*
	(0.233)	(0.253)	(0.263)	(0.295)	(0.285)
ln(gdp)	0.567*	0.393*	0.484*	0.300*	0.303*
	(0.0211)	(0.0229)	(0.0237)	(0.0267)	(0.0257)
ln(gdppc)	-0.0962*	0.403*	0.128*	0.531*	0.386*
	(0.0305)	(0.0330)	(0.0342)	(0.0385)	(0.0372)
ln(dis)	-0.113*	-0.103*	-0.133*	-0.138*	-0.130*
	(0.0380)	(0.0413)	(0.0429)	(0.0483)	(0.0466)
N	1338	1341	1341	1341	1342
R^2	0.38	0.35	0.31	0.32	0.28

Standard errors in parentheses. Most variables are in natural log (ln) terms; empl. is employment, ppe is property, plant, and equipment, ETR is effective tax rate, gdp is gross domestic product, gdppc is gross domestic product per-capita, and dis is the port distance between the U.S. and the foreign country.
* $p < 0.05$

Table 2: Fixed Effects Regressions Explaining Activity Levels, 1983-2011

	(1) ln(empl)	(2) ln(sales)	(3) ln(ppe)	(4) ln(assets)	(5) ln(grossinc)
ETR	-0.393*	-0.465*	-0.482*	-2.070*	-2.383*
	(0.108)	(0.118)	(0.154)	(0.185)	(0.173)
ln(gdp)	0.00501	-0.0250	-0.0613	-0.163*	-0.0369
	(0.0294)	(0.0322)	(0.0418)	(0.0502)	(0.0472)
ln(gdppc)	0.776*	1.513*	1.349*	2.165*	1.818*
	(0.0457)	(0.0500)	(0.0650)	(0.0781)	(0.0733)
N	1356	1359	1359	1359	1360
R^2	0.41	0.67	0.47	0.64	0.64

Standard errors in parentheses. Variables are defined as in Table 1.
* $p < 0.05$

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Table 3: Regressions Explaining Gross Fixed Capital Formation/GDP

	(1)	(2)	(3)	(4)
Growth of Real GDP	0.0844*	0.0980*	0.0722	0.0913*
	(0.0389)	(0.0407)	(0.0403)	(0.0406)
Unem. Rate	-0.647***	-0.627***	-0.706***	-0.643***
	(0.0338)	(0.0363)	(0.0356)	(0.0378)
6 yr. Rel. Tax (Stat Comb.)	0.0451**			
	(0.0166)			
6 yr. Rel. Tax (Stat Central)		0.000751		
		(0.0177)		
6 yr. Rel. Tax (Eff Tax Rate)			0.00516	
			(0.0164)	
6 yr Rel. Tax (Rev/GDP)				0.4006**
				(0.1076)
Constant	0.272***	0.269***	0.276***	0.264***
	(0.00463)	(0.00494)	(0.00447)	(0.00487)
Fixed Effects?	yes	yes	yes	yes
Time Effects?	yes	yes	yes	yes
N	546	524	518	601
R^2	0.58	0.54	0.55	0.49

Standard errors in parentheses. Variables are defined in the text.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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Table 4: Regressions Explaining ln (K/L)

	(1)	(2)	(3)	(4)
GDP per-capita	0.0321 (.0342)	0.110** (.0351)	-0.0295 (.0389)	0.0546 (.0404)
6 yr. Rel. Tax (Stat Comb.)	0.00980 (0.0818)			
6 yr. Rel. Tax (Stat Central)		-0.253** (0.0827)		
6 yr. Rel. Tax (Eff Tax Rate)			0.102 (0.0832)	
6 yr Rel. Tax (Rev/GDP)				-0.553 (0.537)
Constant	10.84*** (0.333)	10.06*** (0.342)	11.36*** (0.373)	10.61*** (0.394)
Fixed Effects?	yes	yes	yes	yes
Time Effects?	yes	yes	yes	yes
N	601	579	582	644
R^2	0.76	0.79	0.75	0.75

Standard errors in parentheses. The dependent variable is the capital/labor ratio. Other variables are defined in the text.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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