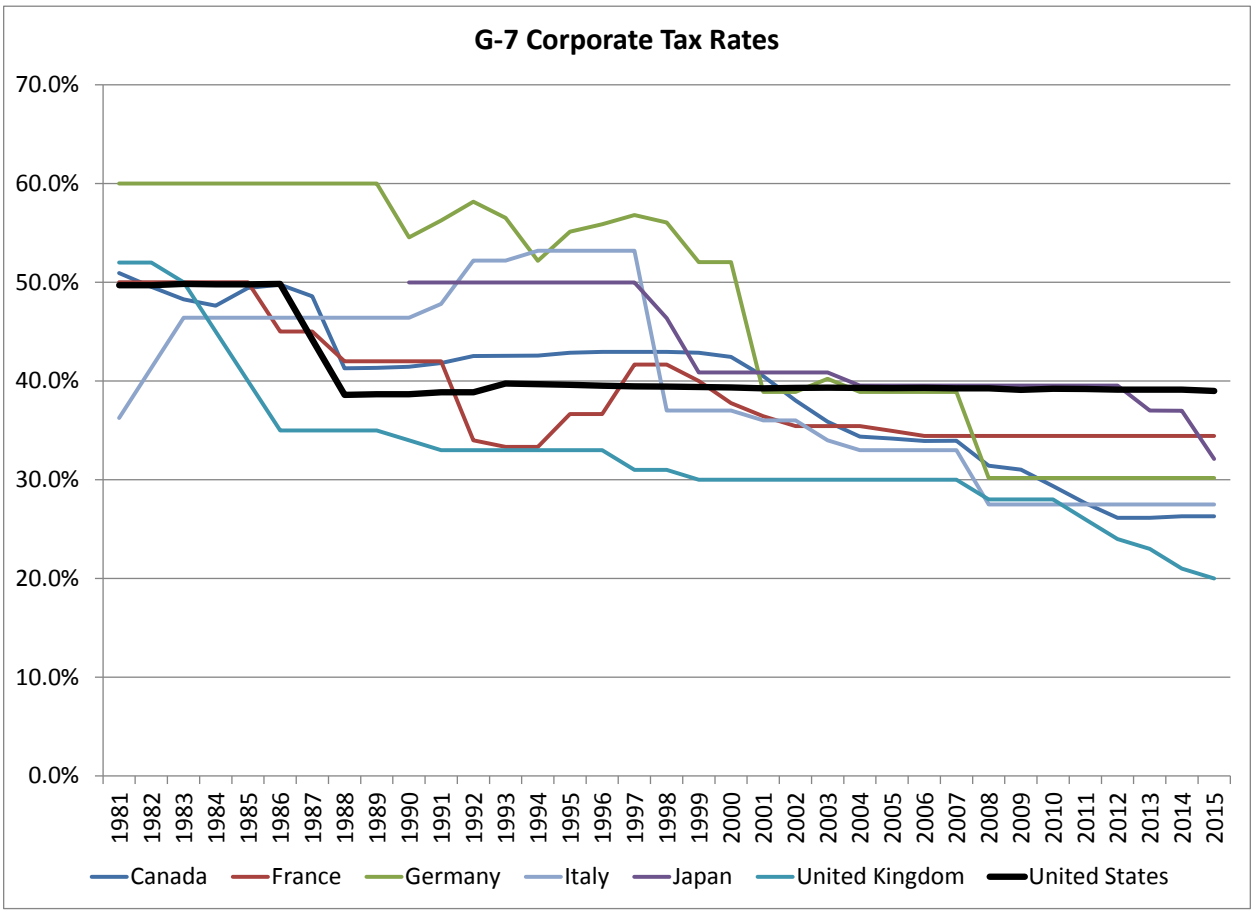
Economics 230a, Fall 2015
Lecture Note 12: Introduction to International Taxation

It is useful to begin a discussion of international taxation with a look at the evolution of corporate tax rates over the past few decades. Here are the rates (for all levels of government combined) for the G-7 countries since 1981, from the OECD Tax Database:



There is a pretty clear downward trend, with rates ranging from 36%-60% in 1981 and 20%-39% in 2015. Of note is that the highest tax rate now is for the United States. A similar trend exists for other developed countries as well. Also, there are many countries, typically quite small in population and GDP, where corporate tax rates are close to or equal to zero. Such countries are commonly known as "tax havens." In between tax havens and the G-7 countries, in both size and tax rates, are countries like Ireland, where the tax rate is now 12.5%. Even Ireland, though, has made a transition to this low tax rate, having begun in 1981 with a tax rate of 45%.

The trend toward lower tax rates is sometimes characterized as a "race to the bottom" resulting from tax competition among governments, but such a description fails to explain why competition might have become more intense over time, as the falling rates would suggest. We will discuss the tax competition literature, but it is first necessary to explore in more detail the important attributes of international tax systems.

The Basic Structure of International Tax Systems

International tax systems differ not only in their rates and their bases (e.g., what expenses are deductible, etc.), but also, very importantly, in the principles countries use to determine which income to tax. While it may at first seem straightforward for a country to tax "its" income, there is no clear definition of the income of any particular country. One obvious distinction, as in the national income accounting distinction between GDP and GNP, is between income earned *in* a country and income earned *by* a country, which in the international tax context amounts to the difference between taxing income according to its source, i.e., where production occurs, and taxing income according to residence, i.e., the location of those earning it. The United States is sometimes said to have a residence-based tax system (also known as a worldwide tax system) rather than a source-based system (also known as a territorial tax system), but the US system is better understood as a hybrid, with some characteristics of a residence-based tax system, some characteristics of a source-based tax system, and still other characteristics that are present under neither the source nor residence approach.

Modeling the Effects of International Taxation

Suppose that there are two countries, the home country and the foreign country, with available before-tax rates of return r at home and r^* abroad. Suppose that the home corporate tax rate is t and the foreign tax rate is t^*. What will be the conditions for cross-border investment in equilibrium?

Under a source-based tax, the home investor's after-tax return at home is $r(1-t)$; the investor's return abroad is $r^*(1-t^*)$. The same returns are available for the foreign investor. Therefore, in capital market equilibrium where both investors are indifferent, the before-tax returns in two countries must satisfy $r = r^*(1-t^*)/(1-t)$. Both investors receive the same after-tax rates of return, but the before-tax rates of return are unequal unless $t^* = t$.

Under a residence-based tax, the home investor's after-tax returns at home and abroad are $r(1-t)$ and $r^*(1-t)$, respectively, while the foreign investor's after-tax returns are $r(1-t^*)$ and $r^*(1-t^*)$. In this case, both investors will be indifferent if $r = r^*$, although the after-tax returns received by home and foreign investors will be equal only if $t^* = t$.

To summarize the results so far, after-tax returns in a particular location are independent of the investor's residence under source-based taxation, while after-tax returns for a particular investor are independent of the investment's location under residence-based taxation. Also note that under residence-based taxation, but not under source-based taxation, before-tax rates of return are equal across the two countries.

Now, consider a hybrid tax system such as that in the United States, which starts from a residence-based tax but then (1) gives a credit against foreign-taxes for US residents, up to the US tax rate; and (2) imposes domestic tax on all investments, not just those owned by US residents. Now, what will the capital-market equilibrium look like, if both countries follow such a tax scheme?

For home investors, after-tax returns for investments at home and abroad are $r(1-t)$ and $r^*(1-t^*)\left(1-\left(\frac{t}{1-c}-\frac{c}{1-c}\right)\right)$, where $c=\min(t,t^*)$ is the maximum rate of foreign tax credit the home country allows. For the foreign investor, the corresponding after-tax returns are $r^*(1-t^*)$ and $r(1-t)\left(1-\left(\frac{t^*}{1-c^*}-\frac{c^*}{1-c^*}\right)\right)$, where $c^*=\min(t,t^*)$.

Note that, for the country with the lower tax rate, the credit rate will be the same as its own tax rate, so that the investor from that country will effectively confront a source-based tax system. On the other hand, the higher-tax country will provide a credit rate equal to the foreign country's tax rate, so that the investor from that country will face the same tax rate regardless of the location of investment, as under a residence-based tax system.

That is, suppose that $t > t^*$, as is realistic if the home country is the United States. Then the after-tax returns for home and foreign investors are, respectively:

home investor: $r(1-t),\ r^*(1-t^*)\left(1-\left(\frac{t}{1-t^*}-\frac{t^*}{1-t^*}\right)\right)=r^*(1-t)$

foreign investor: $r^*(1-t^*),\ r(1-t)\left(1-\left(\frac{t^*}{1-t^*}-\frac{t^*}{1-t^*}\right)\right)=r(1-t)$

Now, capital-market equilibrium is not consistent with both investors investing in both countries, since for the home investor this would require $r=r^*$, while for the foreign investor the condition is $r=\frac{r^*(1-t^*)}{1-t}>r^*$, since we have assumed that $t > t^*$. It follows that equilibrium will be one in which at least one of the investors is specialized. If the home investor invests in both countries, then $r=r^*$ and the foreign investor invests only in the foreign country, since $r<\frac{r^*(1-t^*)}{1-t}$. If the foreign investor invests in both countries, then is $r=\frac{r^*(1-t^*)}{1-t}$ and the home investor invests only at home, since $r>r^*$. If $\frac{r^*(1-t^*)}{1-t}>r>r^*$, then both investors will specialize in their own countries. Thus, the tax system gives rise to a type of <u>home bias</u> in which each investor invests at home but at most only one investor invests abroad.

In reality, the US tax system has another important attribute, namely that earnings abroad are subject to US tax only when the earnings are repatriated, not immediately. This may encourage US companies to keep earnings abroad, to defer paying US tax. As in the case of capital gains taxes discussed in an earlier lecture, this incentive to defer may be especially strong if the companies think that there is a possibility of a lower tax rate in the future. This incentive to defer is sometimes called the <u>lock-out effect</u>, as, in contrast to the induced behavior under capital gains taxation, funds are kept out of US investments, rather than kept in them. The paper by Dharmapala, Foley and Forbes studies the impact on repatriations of an interesting natural experiment in which the United States offered a substantial one-year reduction in the tax rate on repatriations. There was a huge surge in repatriations during that period, although the effects on domestic US investment were small, suggesting that the repatriating companies had sufficient capital market access without the repatriated funds. Note that the lock-out effect would not be present under a pure source-based system or a pure residence-based one; it is the combination of residence-based taxation and deferral that generates it.

Optimal Taxation in an International Setting

In thinking about what a particular country's tax system should look like (and leaving aside the potential reactions of other governments, which will be covered in the next lecture on Tax Competition), it is useful to consider the three potential tax rates on capital income that the home country might impose in the above-two country model: the tax rate on domestic investment undertaken by domestic residents, say τ, the tax rate on domestic investment undertaken by foreign residents, say ϕ, and the tax rate on foreign investment undertaken by domestic residents, say τ^f. (We assume, realistically, that the home country can't impose tax on the fourth combination of investor residence and investment location, investment abroad by foreign investors.) Under a pure source-based system, $\tau = \phi$, and $\tau^f = 0$. Under the pure residence-based system, $\tau = \tau^f$ and $\phi = 0$. Under a hybrid system like that of the United States, but ignoring the possibility of deferral of tax on unrepatriated earnings, $\tau = \phi$, and $0 < \tau^f < \tau$, the last result reflecting the impact of the foreign tax credit, which reduces tax on foreign-source income by as little as 0 (if the foreign tax rate = 0) and by as much as to eliminate any domestic tax (if the foreign tax rate is at least as high as τ). The same effect of reducing τ^f could, of course, be accomplished in a more straightforward manner simply by eliminating the foreign tax credit and imposing a lower statutory rate on foreign-source income, and we can think of the problem of optimal policy design as one of choosing the three tax rates, τ, ϕ, and τ^f.

This problem was first analyzed by Feldstein and Hartman (*QJE* 1979), and we can distinguish the cases of a small country and a large one. It is also helpful to think about special cases in which only home companies invest abroad and in which only foreign companies invest abroad.

For a small, capital exporting country, the operative tax rates are τ and τ^f, and a simple corollary of the Diamond-Mirrlees production efficiency theorem is that capital invested at home and abroad by domestic residents should face the same domestic tax rate in order for domestic and foreign uses of capital to be efficient, from the home country's perspective. (Note that from a *worldwide* perspective this won't result in efficient capital allocation if the foreign country's tax rate is positive, but we are considering what is optimal from the home country's perspective, taking foreign taxes as given.) Hence τ and τ^f should be equal. For a small, capital importing country, there is no benefit to taxing capital imports, so ϕ should be zero. This result (as discussed in Gordon, *AER* 1986) follows from the fact that the elasticity of supply of capital to a small country is effectively infinite, so that a tax on capital imports falls on workers, just like a labor income tax. But the tax on capital also distorts domestic production, making it too labor intensive. Together, these results lead to the conclusion that small countries should adopt a pure residence-based tax on capital income, to the extent that capital income is taxed (which was considered in an earlier lecture). See the Gordon-Hines *Handbook* chapter for further discussion.

For a large country, these results break down because tax policy can affect the terms of trade. For a capital exporting country, a higher tax on foreign source income reduces investment abroad and may therefore increase the before-tax return on such investment. For a capital importing country, a tax on income from inbound investment may drive capital out but also reduce the worldwide rate of return and the hence the cost of funds to the domestic economy.

Further Margins of Behavioral Response

The discussion so far relates to a setting in which national corporations invest in homogenous capital on behalf of their country's residents, choosing between investment at home and abroad. But this abstracts from three key elements of reality:

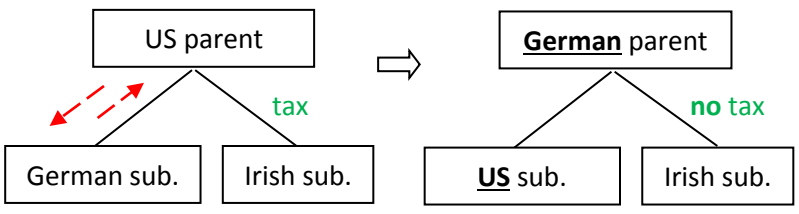
(1) Investments are not homogeneous, and may yield different payoffs to different investors;

(2) Residents of a particular country may invest in domestic or foreign companies, companies obtain funds in a world capital market, and a company's national identity is not fixed; and

(3) The actual source of production and earnings is difficult to determine when an individual company operates in more than one jurisdiction.

The first of these points suggests that it is not simply the level of capital, but also the pattern of capital ownership, that may be distorted. For example, a country might simultaneously be a capital exporter and a capital importer, even if it is a net capital importer, if its companies are particularly good at investing in certain places abroad. Then, a tax on inbound investment, which raises the domestic before-tax return and leads to a reduction in capital imports, also distorts the pattern of ownership by domestic firms, causing them to invest too much at home and too little abroad. Thus, the home government may wish to reduce the tax on foreign investment, τ^f, below τ, in order to offset this distortion (Slemrod et al., *J Pub. E.* 1997).

The second point means that taxing the income of resident *corporations* is not equivalent to taxing the income of resident *individuals*. Thus, the efficiency arguments for residence-based taxation at the *corporate* level are less apparent. Further, another margin of potential distortion arises in a company's choice of residence, which has been a major policy issue recently in the United States. Consider, for example, a case in which Germany and the United States have the same corporate tax rates, but Germany follows a territorial tax system (as it actually does) and the United States follows a worldwide tax system with foreign tax credits. A company obtaining funds in a world capital market will face the same cost of capital regardless of its own residence, and will also face the tax rate on operations in either Germany or the United States. But a German company operating in a third, low-tax country, say Ireland, will face only the low tax rate in that country (because Germany has a territorial tax system), while the US company will face Irish tax plus additional US tax, because the tax credit for Irish tax offsets only some of the US tax liability on repatriated earnings. Hence, the US company faces a competitive disadvantage relative to the German company on operations in Ireland and other low-tax jurisdictions. If the company can relocate from the United States to Germany, it may do so, even if there are economic benefits to being in the United States. This change in residence is commonly called a corporate inversion because the simplest way to accomplish it (prior to 2004 legislation) was to have the US parent switch places in the corporate structure with a foreign subsidiary, as shown in the figure below.



The approach taken more recently, still referred to as an inversion, is for a US company to merge with a foreign company and declare residence for the combined entity in the other company's country.

The third point above means that firms will engage in profit shifting across jurisdictions in which they operate when different tax rates apply. For example, a US corporation may license intellectual property developed in the United States to a wholly owned Irish subsidiary for a very low price, meaning that the US company's profits will be understated and the Irish subsidiary's profits overstated. If the Irish subsidiary's profits were immediately subject to US tax, as under a pure residence-based tax, there would be no incentive for the US company to engage in profit shifting, which underlies arguments for a shift toward more immediate taxation of US profits abroad. But this shift would also increase the taxes on US companies relative to foreign companies and exacerbate incentives for US companies to engage in corporate inversions. On the other hand, a US shift toward source-based taxation would lessen incentives for inversions but increase incentives for profit shifting, because once shifted, profits would be completely free of subsequent US taxation.

The paper by Dharmapala and Riedel estimates the extent of profit-shifting among a sample of European multinationals by measuring the reaction to a parent's earnings' shocks of the earnings of subsidiaries in other countries. They find that earnings in low-tax countries respond more positively than earnings in high-tax jurisdictions, suggesting that the parent is shifting some of the home income shock to the low-tax jurisdictions. The authors identify the choice of borrowing location as a key channel through which the profit-shifting occurs (accomplished through interest deductions in the location where the borrowing takes place).

Returning to the figure presented at the beginning of the lecture, we can observe that a reduction in the corporate tax rate reduces incentives for inversions (by lowering US tax on foreign operations) and for profit shifting (by reducing the tax benefit of shifting profits from the US to other countries). This, along with the growing importance of multinational companies in the global economy, may help explain the trend toward lower corporate tax rates around the world, although there has also been a movement away from residence-based taxation, at least outside the United States.