

**Location, (Real) Location, (Tax) Location:
An Essay on Mobility's Place in Optimal Taxation**

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“Watch the police and the tax man miss me, I’m goin’ mobile.” --The Who

1. Introduction and Motivation

Optimal taxation is shorthand for the normative theory of taxation—how should we tax ourselves? The modern theory of optimal taxation matured in the early 1970’s, when the theory was established in a rigorous way in a series of seminal papers by, among others, Peter Diamond and James Mirrlees. Because nowhere in these papers does the word “mobility” or “mobile” appear, one might be tempted to conclude that these concepts are not central to optimal taxation. This is incorrect. With a broad definition of mobility, it is *the* central concept. With a narrower definition focused on mobility of location, it is a key concept.

An essay on optimal taxation might strike some as an oxymoron. After all, its main intellectual contribution was to substitute rigorous analysis for vague rhetorical argument that did not, and does not, lend itself to intellectual progress. My favorite example of the imprecision of pre-optimal-tax normative reasoning comes from a 1917 book by Robert Jones entitled *The Nature and First Principle of Taxation* in which the author offers a list (incomplete, he admits!) of seventeen “maxims, canons and principles” of taxation stated in the literature to that day. They are: equality, proportionality, certainty, economy, convenience, productivity, justice or equity, generality, consistence, elasticity, unity, diffusion, exemption of minimum, relation to franchise, graduation, minimum sacrifice, and faculty or ability. No modern economist would have the patience to argue which tax system better achieved, or much less struck a balance, among these 17 principles. In the framework of the theory of optimal taxation, though, one can have a productive dialogue about what these principles might mean, and how alternative tax systems trade them off, and how the tradeoff depends on explicit assumptions about the objective of the policy maker, the model of the economy and its

parameterization, and what policy instruments are available and what constraints face the policy maker.

But this is indeed an essay, not an analysis, and is really a set of observations about the role of mobility in the normative theory of taxation. It focuses on the implications of the fact that multiple jurisdictions raise the question to only of real mobility of factors and goods, but also the ability to shift the tax base out of the home jurisdiction without much, or any, real movement, tax havens ebbing an extreme example of this. I explore the implications of expanding our notion of mobility by first defining it and then addressing its place in optimal taxation.

1.1. Before-Tax Semantics

Mobility is “the ability to change location.” In economics jargon, it refers to the elasticity of supply of a location-denominated factor with respect to its net reward in that location. So, for example, perfect mobility refers to an infinitely elastic supply curve—if some net reward available as an alternative elsewhere is not offered, none of the factor will stay in the location.

This notion of mobility is distinct from movement, which is sometimes used as a retrospective measure of mobility.¹ This is an important distinction because, in equilibrium, we may observe little or no movement when the attractiveness of alternative locations does not change, even though there are no barriers to movement—i.e., there is mobility.²

How difficult determining location is depends on what is to be located, and varies a lot across concepts that may be the basis for taxation. Science fiction aside, the location at a given point in time of a person is well-defined.³ The same is true of other physical

¹ In economics mobility also refers to the ability of people to change from one social group, class, or level to another. This essay does not address that issue.

² Another definitional issue is to distinguish the one-time movement of a stock/asset from a flow. If a factory is originally built somewhere because of, say, taxes, I’ll refer to that as mobility; even if it never “moves”, its location has been affected. The analogy to people movement is the location of birth.

³ But even this becomes unclear for accounting periods that span, say, a year—where was I located in 2008 if I lived in Michigan for six months and in New York for six months? Indeed many of the same issues that arise in the movement across jurisdictions arise in the movement across accounting time periods.

objects, of course, but there is a difference, because it is people who determine the physical location of things such as copy machines, paper clips, drill presses, computers, and factories. When we speak of the mobility of physical capital, we are referring to the cost to people, or people acting in the interest of a legal entity such as a corporation, of changing the physical location of these objects. This distinction also matters because, although both labor and capital (and land) are factors of production, governments' objective functions (should) be concerned with people and their well-being, while the other factors of production play only instrumental roles in designing policy to improve the well-being of people.

There are physical bounds on mobility, generally referred to as transportation costs. These are subject to innovation such as the steamship for transporting physical objects and the Internet and computerized translation for transporting information. Government policies such as capital controls, immigration/emigration policies, tariffs, and differentiated tax policies may also affect the attractiveness of one location versus another, and may also affect the private cost of moving from one jurisdiction to another.

The ability of people to move—their mobility—depends on their personal adaptability and, given some fixed costs, their level of wealth. Physical factors of production other than labor do not have location preferences—people, unlike copy machines, may “like” where they reside.⁴ Some of this attachment may be transmitted across generations. However, non-labor factors of production may have characteristics, such as the language in which their instructions are written or whether they are calibrated in metric or imperial units, which make them more productive in one place rather than another. A copy machine whose LCD instructions are in English rather than German or if the specifications will not be quite as valuable if used in Germany. As the possibility of worldwide use of productive inputs increases, so has the proliferation of multi-language instruction manuals, which increases mobility.⁵ So too may people have location-specific human capital.

⁴ If people are able, but unwilling, to move, this makes them less mobile according to my definition.

⁵ For some goods such as mobile homes and mobile phones, their mobility is so central to their value that it becomes part of their name. Alas, the etymology of the name of the Alabama port city of Mobile apparently does not have to do with mobility, but rather to the Mobile tribe of Native Americans who were

Corporations are neither people nor other physical objects. Because these are legal fictions, or constructs, the principles of physics that pin down the location of physical objects are of no direct use. However, the law of any country will require that a corporation be located in a particular country, and the tax consequences may vary, for a given constellation of real operations, depending on where that location is.

We are ultimately interested not only in where people and corporations *are*, but where they *do* certain things such as consumption and production. The physical location of an act of consumption by a given person is often clear—think of eating an ice cream cone or getting a haircut. The consumption service provider need not be in the same location, though. When multiple consumers are simultaneously involved in an act of consumption, such as a phone call or an Internet chat group, things get trickier. Moreover, for goods rather than services, the place of purchase and the place of consumption might differ, as is the case with casual cross-border shopping, or in some cases, smuggling, of cigarettes.

Nor is physics of much help when the issue is the location of ubiquitous tax bases such as income or business profits. Allocating the income of a multi-jurisdictional operation to jurisdictions is a conceptually difficult problem, and in practice is sometimes determined by rules of thumb that have little or no conceptual underpinning. Wealth in the form of human capital is presumably located where the person is, but is seldom part of a tax base. Where physical assets are located is not a conceptual problem, but where their value is may be. The location of intangible assets such as patents, organization knowhow, and so on is extraordinarily contentious.

The difficulty of ascertaining location matters because most jurisdictions have locational bounds on many of their tax bases. The tax definition of location need not correspond to either the relevant physics or economic theory, and it is the tax definition that affects the incentives regarding where to place real factors and where to locate tax bases, for given real location.

2. Taxation

present in the area of Mobile Bay in Alabama when the area was first settled by the French in the early 1700s.

Mobility is important in economics even without multiple jurisdictions and without taxes because barriers to mobility may impede the efficient allocation of resources. But taxes, and especially taxes levied by multiple jurisdictions, make it more important, and more interesting.

2.1. One Jurisdiction

Mobility matters for optimal tax systems even within a jurisdiction, because it can make a tax base easy or hard to verify, and can make the person or entity responsible for remitting tax easy or hard to track down. Presumably this is what The Who had in mind in the song line quoted in the epigraph. As the ominous tone of the statement “I know where you live” implies, knowledge of personal location can help in enforcement of contracts and other obligations, including tax obligations.

This is of course what is behind the long-standing debates between *in rem* taxes versus *in personam* taxes. In many past, and current, situations it is easier for a tax authority to verify that a farm or other piece of property exists and to estimate its value than it is to verify who the owner is. An *in rem* tax specifies a tax and the consequences of non-payment (including possibly forfeiture of the property), and leaves who must remit unspecified. It is also behind the struggle over remittance responsibility and the use in many developing countries of reverse withholding schemes that apply to small businesses. Under these schemes big businesses that either sell to or buy from small businesses are required to remit a fraction of the transaction value to the tax authority, which can be credited against the business income tax liability of the small business (who are, though, assumed to often not be in the tax net at all) . This may be a sensible part of an optimal tax system if small business remittances are more costly to collect, in part because they can move their location to evade the tax net.

So, mobility matters in setting up a tax system even within a single jurisdiction because it is one aspect of the cost of enforcement, and the (endogenous) behavioral response to taxation. It matters more, though, with multiple jurisdictions.

2.2. Multiple Jurisdictions

In addressing inter-jurisdictional mobility, I limit the topic by considering only issues that arise in non-overlapping jurisdictions, and thus ignore questions related to fiscal federalism. I will begin by discussing situations without cooperation or supra-jurisdictional authorities.

Jurisdictions levy taxes on a wide variety of bases. For each base, the geographical span must be defined, and generally the remitter must be specified, as well, including the geographical span. In some cases, such as U.S. state corporate income taxes that use an apportionment formula, the base (which can also be interpreted as the effective rate) depends in a complicated way on the location of the assets, employees, and sales of the corporation. The rights of jurisdictions to tax bases located outside their borders are constrained by nexus and other rules. Certainly in general the cost of ascertaining and collecting tax on bases located out of the jurisdiction is higher than otherwise.

3. Mobility and Optimal Taxation—Single Jurisdiction Welfare

3.1. Exogenous Mobility

A prominent feature of optimal tax theory is the dictum to, other things equal, avoid elastic tax bases. This follows from the prescription that an optimal policy will equalize the Marginal Efficiency Cost of Funds (*MECF*) of any and all tax instruments that are employed.⁶ The *MECF* of a particular tax instrument is defined as the marginal cost to society of raising an extra dollar of tax revenue using that tax instrument. The higher is a tax instrument's *MECF*, the less efficient is the tax instrument at collecting revenue. The equalize-*MECF* principle holds because, if this isn't the case, the same revenue can be raised at less social cost by reducing reliance on high-*MECF* tax instruments and increasing reliance on low-*MECF* instruments.⁷

To see what the *MECF* of a given tax instrument looks like, I begin by ignoring administrative and compliance costs and assume there is no evasion. This means the only

⁶ The *MECF* analysis applies to incremental policy changes, but the intuition applies to non-incremental policy changes, as well. I abstract from distributional concerns here, and come back to them briefly later.

⁷ In the more general model where the level of public spending is chosen optimally, it will also be true that the common value of the *MECF* for all tax instruments is equal to the social marginal benefit of public spending. This suggests that the level of public spending should depend, in part, on the efficiency of the tax instruments available to collect the revenue.

costs of taxation we need to worry about are the loss in purchasing power and distortion costs. In this case, it turns out that the *MECF* of tax instrument i is just equal to X_i/MR_i , where X_i is the change in revenue (from a marginal adjustment to the tax instrument) assuming no change in behavior, and MR_i (marginal revenue) is the change in revenue allowing for a behavioral response (substitution to activities that are more lightly taxed but otherwise less rewarding). Since the behavioral response will tend to reduce the revenue raised, X_i will generally exceed MR_i , and therefore the *MECF* will be greater than one.

The reason we end up with this formula is that, as well as being the change in revenue assuming no behavioral response, the numerator, X_i , is also the cost to citizens, measured in dollars, resulting from the marginal change in the tax instrument. (The denominator, MR_i , simply rescales the cost so that relates to raising an extra dollar of revenue, not an extra MR_i dollars.) Without a behavioral response, the increase in revenue would have been X_i , but because of changed behavior, only an extra MR_i was collected. This means that $(X_i - MR_i)$ “leaked” outside the tax system because of behavioral response. But a taxpayer will be ready to suffer a utility loss of up to, but no more than, one dollar order to save a dollar taxes and so, the marginal utility loss is exactly equal to the leakage. This means, the individual will suffer a utility loss of $(X_i - MR_i)$ dollars in saving $(X_i - MR_i)$ dollars of taxes (remember the change in the tax instrument is a marginal change). Thus, the total utility loss, and social cost, of the tax change is $MR_i + (X_i - MR_i)$, or X_i .

I began by assuming no evasion and no administrative and compliance costs, so that the behavioral response envisioned was, for example, working less—a taxpayer would be willing to substitute leisure valued up to $(X_i - MR_i)$ dollars than the return to working. Now consider a model in which evasion is possible (still assuming no administrative and compliance costs). On the margin, the taxpayer would be still be ready to sacrifice utility valued at one dollar (in additional risk bearing due to evasion and/or due to substitution to activities that are more lightly taxed but less rewarding) in order to reduce tax liability by one dollar. Hence, we do not have to know whether the leak is due to evasion or to substitution in order to evaluate the costs to society. All one needs to know is the potential tax revenue (assuming no behavioral change) from a

change of a parameter of the tax system, and the actual change (taking into account all behavioral responses) in order to evaluate the marginal efficiency cost of raising revenue.

If we allow for administrative and compliance costs, the *MECF* becomes a little more complicated:

$$(1) \quad MECF_i = \frac{X_i + C_i}{MR_i - A_i}.$$

In this expression C_i stands for the marginal compliance cost of tax instrument i , A_i the marginal administrative cost, and $(MR_i - A_i)$ the net tax revenue collected at the margin. The logic is the same as before: the numerator is the social cost of the tax change; the denominator is actual revenue collected (this time, net of administrative costs), rescaling the numerator so that it becomes the marginal social cost of raising an extra dollar of (net) revenue rather than an extra $(MR_i - A_i)$ dollars.

This can be re-stated in terms of the elasticity of the tax base with respect to the net-of-tax amount, $1 - t$, which we would expect to be a positive number, as follows

$$(2) \quad MECF_i = \frac{1 + c_i}{1 - (t/(1-t))\varepsilon - a_i},$$

where a_i and c_i are marginal administrative and compliance costs as a fraction of the tax base and ε is the elasticity of the tax base with respect to the net-of-tax rate applied to it. The higher is the value of ε , ceteris paribus, the higher is the *MECF*.

Note that in the special case where both a_i and c_i are zero, then we have

$$(3) \quad MECF_i = \frac{1}{1 - (t/(1-t))\varepsilon_i}.$$

In this case, equalizing the *MECF* would yield a familiar inverse elasticity rule; but, if either a_i or c_i is non-zero, the inverse elasticity rule must be amended to account for differences' in the relative marginal administrative and compliance costs.

What implications does the optimal policy have for the design and implementation of tax systems? The first is that tax instruments with a high *MECF* (ceteris paribus, high ε) will, all else equal, have a less prominent place in the tax system than those with a low *MECF*. This should be obvious from the fact that an optimal policy raises revenue in the least costly way. This may require some high-*MECF* tax instruments not to be used at all.

Locational mobility is one component of the elasticity of a tax base, because it is one way that revenue leaks out of a jurisdiction's revenue coffers. Therefore, other things equal, *the higher is the locational elasticity of a tax base, the lower is the optimal tax rate on that base.*

If domestic labor supply is fixed, then this reasoning leads to the following theorem: small open economies should levy *no* distorting tax on factors that are perfectly mobile locationally.⁸ The logic behind this theorem has two parts. First, it relies on the fact that there is a perfectly immobile factor that can be taxed to raise all necessary revenue and can, indeed, be taxed with no efficiency cost. If minimizing efficiency cost is the sole objective, then revenue can be raised with no efficiency cost by raising all revenue from taxing the immobile factor. In terms of the *MECF*, looking at expression (3) reveals that if ε is zero, then the *MECF* is equal to one (no marginal excess burden), certainly lower than any tax for which $\varepsilon > 0$; the theory says to tax only the immobile factor.

But the argument can go farther. Even if the government has distributional objectives (in the sense that it cares not only about national income but separately about the after-tax wage rate and the after-tax return to capital of its citizens), it is optimal to tax only the immobile base. This is because of an incidence aspect of taxation in a small, open economy: in the long run all taxes will be borne by owners of immobile factors, so that attempting to tax the mobile factor will be ineffective in shifting the burden from capital to labor. And, because taxing these immobile factors directly avoids the efficiency cost of causing mobile factors to leave, it dominates taxing the mobile factor even if one has distributional preferences.

Even if labor supply is subject to choice and therefore in general not in fixed supply, the Diamond-Mirrlees (1971) conclusion--that aggregate production efficiency is

⁸ See Dixit (1985) or Gordon (1986).

desirable in the presence of optimal commodity taxation--implies that a small, open economy should avoid distorting source-based taxes. This is because trade in capital is essentially equivalent to another production sector, and therefore production efficiency requires that tax policy not distort trade in goods or factors. For a given revenue requirement, any (inevitably distorted) allocation of consumption goods can be achieved without the additional distortion of operating within the production possibility frontier; in the words of Wilson (1999, p. 282), “A small region faces an infinitely elastic supply of capital at the after-tax return required by investors in the world economy.”

Once we recognize the administrative and compliance costs incurred in taxing labor income, this conclusion no longer necessarily follows. As Slemrod and Wilson (2007) develop, the presence of these costs implies there is a deadweight loss associated with taxing labor income and implies that a small open economy would want to tax both labor and capital.⁹ In terms of the expressions presented above, if taxing the immobile factor generates a positive a_i or c_i , then its *MECF* can be positive even when its tax rate is zero; in principle, this *MECF* can be higher than the *MECF* of a mobile factor.¹⁰ The administrative and compliance costs break the equivalence between directly taxing labor and exacting a burden from labor due to capital flight and the subsequent decline in the marginal product of labor and, therefore, the equilibrium wage rate.

3.2. Endogenous Location Mobility

In the standard model of optimal taxation, the elasticity of the tax base is a function of individuals’ demand substitutability among goods, producer’s substitutability among inputs, and so on. These preference and technical factors are usually assumed to be immutable with respect to the policy exercise at hand, and so the elasticity is immutable, as well.¹¹ However, especially once avoidance and evasion responses to

⁹ It may be that the avoidance and evasion of wage taxes, and therefore the administrative and compliance costs of raising a given amount of revenue, depend on the statutory tax rate on capital income. Gordon and MacKie-Mason (1995) emphasize this linkage. In their model, if capital income is not taxed, then taxpayers have the incentive to re-characterize and report wage income as capital income for tax purposes. Raising the capital tax rate reduces this incentive, lowering the deadweight loss from wage taxation.

¹⁰ This is the assumption made in Slemrod and Wilson (2007), discussed in more detail below.

¹¹ This is not to say for example, that the elasticity of demand may be different at different consumption vectors.

taxation are recognized, the elasticity of the tax base can be affected by a wide range of policies, and thus there is not an immutable elasticity, but a choice of elasticities. Indeed as Slemrod and Kopczuk (2002) put it, there is an *optimal* elasticity of the tax base implied by the optimal setting of the tax system and other policy parameters that affect the tax base elasticity.

Location mobility, as one component of tax base elasticity, can be altered by tax system (and other policy) parameters. It is also dependent on the choices made by private actors. To some extent, for people (and physical assets, as the copier example above suggests), mobility is an attribute that can be acquired. For example, an individual might be able to increase her earning ability in another country by, for example, learning English or another foreign language. Indeed, so doing might be a valuable form of insurance in the face of domestic policy uncertainty. Historically, for ethnic or religious groups especially subject to the whims of policy uncertainty, investment in mobile assets, such as knowledge and gold, were particularly attractive.

Mobility is also helpful in a negotiation, because by expanding one's options it increases bargaining power. So, for example, if a single, or set of, multinational corporations are engaged in a negotiation over its tax treatment the ability to respond by moving activity—and tax base--in or out of a country is valuable. Thus any company anticipating being a party to future negotiations may want to invest in mobility.

Because mobility is endogenous to policy, tax policy must be determined simultaneously with mobility policy, which includes immigration laws as well as capital controls. So there may be *optimal mobility*. Although real mobility generally expands a country's consumption possibilities by allowing it to focus on its comparative advantages, it also increases the cost of raising revenue for socially valuable purposes.

Tariff policy presents a fascinating example of the policy tension that may arise between openness and revenue-raising concerns. Many dispensers of policy advice, including in some situations the International Monetary Fund, have counseled that developing countries remove their barriers to trade, most notably tariffs. Value-added taxes (henceforth VAT) have figured prominently among recommendations for less trade-distorting alternative ways to make up the revenue lost from tariffs. But, it turns out, tariffs are a notoriously good “tax handle,” which, in the language of optimal tax

systems, means that the administrative and compliance costs per dollar raised by tariffs are relatively low in countries with weak institutional infrastructure. This suggests an apparent paradox: although I have suggested that location mobility increase the elasticity of the tax base and therefore the marginal cost of raising funds, borders may in some situations facilitate tax collection. It is not that *any* border facilitates tax collection, but easily monitorable border crossings where, for natural reasons, much commerce passes can do so. Finally, note that in practice value-added taxes in many developing countries are relatively good at collecting revenue at the border, and much less effective at collecting tax triggered by domestic transactions. Ebrill, et al (2001, Table 4-3) report that, on average over 22 developing countries, that VAT collected on imports comprises 55 percent of total VAT revenue. Thus, existing VATs do not necessarily feature the absence of implicit domestic production subsidies that textbook VATs have.¹²

3.3. Location Avoidance and Evasion

When location is a determinant of tax liability, it is subject to both evasion and avoidance. Taxpayers may intentionally misstate the location of a tax base. By definition, evasion is illegal, although admittedly in practice the line is often blurry. In some case camouflaging, or facilitating, evasion entails changes in real behavior. For example, doing some real activity in a location where income is fraudulently claimed may reduce the likelihood of an inquiry into the practice.

Avoidance is tricky to define. Slemrod and Yitzhaki (2002) define it as a behavioral response that includes no change in real decisions (other than those that arise because of an income effect), but rather are re-characterizations for tax purposes of the same real decisions. Tax avoidance involving other cross-border transactions for high-income, high-wealth individuals and for multinational corporations is supported by a flourishing private sector that facilitates this kind of behavior. Of more interest is the fact that many governments actively encourage the (inward) shifting of taxable income (and

¹² This statement assumes, without evidence, that domestic value-added is actually greater than the percentage of value-added tax collected on domestic value-added. On the efficiency properties of VAT with informal economies that make collection of tax on domestic value added difficult, see the contending viewpoints offered in Emran and Stiglitz (2005), who argue that in the presence of an informal economy a the replacement of trade taxes with VAT reduces welfare under plausible conditions, and Keen (forthcoming), who argues that the Emran-Stiglitz conclusion relies on a fundamental misconception of how the VAT collects taxes at the border.

perhaps other base). Tax havens offer an extreme example of this, and are discussed below. Many non-haven countries have tax system features that apparently facilitate multinational corporation tax avoidance, such as the Belgian coordination centers.

Two examples of how borders can facilitate tax evasion are carousel fraud and round tripping. Carousel fraud takes advantage of the destination basis of the value-added tax and its implementation through the combination of the policy of not allowing credits for imported business purchases and zero-rating of exports, making exporters generally eligible for net refunds from the tax authority. To see how carousel fraud works, consider the highly simplified example of a pure entrepôt transaction, where a good is imported and immediately exported with no value added. If the importing and exporting are done by a single firm, no VAT is due because the export sale does not trigger tax liability and the imported inputs do not generate tax credits. But now imagine that the importer and exporter are two different businesses (and there is no transfer pricing manipulation); in this case, the importer would have net tax liability equal to the tax rate times the value of the goods, and the exporter would be eligible to receive an (offsetting) net refund. Under the carousel fraud schemes, the exporter receives the refund and the importer “disappears” before the tax due is remitted, resulting in a net transfer from the government to the conspiring importer and exporter; in practice, the schemes are more complicated, often with sometimes unwitting businesses interspersed in the distribution chain between the importer and exporter.

Round tripping refers to schemes where domestic capital goes to a tax haven, where it is typically invested in holding companies that have no operating assets, and the holding companies in turn own domestic companies. One motivation for round tripping arises when a country offers tax concessions to inward foreign direct investment. For example, until 2008 foreign firms operating in China were subject to a corporate tax rate of 17 percent, while a 33 percent rate was imposed on domestic firms. In addition, foreign enterprises were offered two years of tax holiday after turning profitable and a tax reduction of 50 percent for the subsequent three years. Dollar and Kraay (2005) and Prasad and Wei (2005) estimate that when these tax provisions were in place round tripping represented as much as one-third of China’s apparent direct inward foreign direct

investment. This kind of cross-border shifting of tax bases is likely to crop up whenever a jurisdiction tries to differentially tax depending on the location.

The underlying dynamic is that a taxpayer is indifferent to which country taxes are remitted, but from a national welfare point of view it is better that taxes are paid to it rather than to another country. This is the logic behind the well-known result that, with a fixed capital stock, national welfare is maximized by allowing income taxes paid to a foreign country as a deduction against domestic taxable income, as opposed to a credit. This obtains because, from a national welfare perspective, a tax paid to a foreign country is a cost like any other cost, and for neutrality should be treated the same as other costs.

A country might want to consider how to break private agents' indifference regarding which country collects tax remitted. Konrad (2008) develops a model in which countries involved in Bertrand competition over tax rates may expend resources to make some of their taxpayers less mobile (in his terminology, "instill patriotism"), or to increase the mobility of taxpayers in other countries. He refers to less mobile residents as "loyal citizens", an analogy to the "loyal customers" in business discourse. Loyal citizens pay the tax that applies in their country; in contrast, non-loyal citizens are perfectly and costlessly mobile and locate in the country with lower taxes. A country benefits from having more loyal citizens if it attracts and taxes only this group, but this becomes a strategic disadvantage because other countries that do not invest in loyalty may benefit from this investment. Investment in citizen loyalty is wasteful from a global welfare point of view, but in a second-best world it may be beneficial as it allows countries to collect closer-to-optimal taxes from the citizens.

Another way to break this indifference is to provide a "reward" for tax payments. This is feasible in the context of multinational corporations, whose tax liability is allegedly a matter of negotiation in many developing, and some developed, countries. If the negotiated settlement includes not only tax payments but also such matters as roads leading to factories or upgraded port infrastructure that would benefit importers, then to

which government to remit taxes, which otherwise would be matter of indifference, is no longer so.¹³ In a sense this is a movement toward benefit taxation.

3.4. Models where Capital Has Tax Mobility

Why does it matter whether a factor, say capital, has real mobility or tax mobility? To illuminate the difference in policy implications, compare the standard model of a small economy with free capital mobility to one in which real capital is completely immobile but where the capital tax base may be shifted out of the country. (In the absence of mobility *or* shifting, a capital tax would be borne entirely by capital owners in a static model like this that assumes with fixed wealth.¹⁴) There is a convex private cost to tax base shifting, though, which may or not also be a social cost. In both models there is a deadweight loss to taxing labor, so that a small open economy will in general seek a mix of labor and capital taxes.

Begin with the case where the private cost of shifting is also a social cost. Then in both models increasing the tax rate on capital will erode the tax base, in the real mobility model by causing capital flight and in the shifting model by causing base flight, ostensibly abroad. The policy implications differ, however. In the real mobility model it is unlikely that limiting access to foreign capital—“throwing rocks in the harbor,” to use Joan Robinson’s phraseology—will be welfare-improving. In the shifting model, though, actively limiting base flight may be an appropriate policy response. Increasing the private marginal cost of shifting will reduce the amount of shifting and therefore increase the tax base, which in turn will allow lower tax rates to raise a given amount of revenue; it will also reduce the total social cost of shifting. This policy also reduces the responsiveness at the margin to a tax rate increase, so it reduces the marginal excess burden of taxing capital and makes capital tax more attractive than otherwise. Thus it may well be appropriate for the government to incur costs to increase the cost of shifting, and the optimal amount of capital tax should be calculated with reference to the optimal

¹³ I suspect, but have no evidence to support, that providing a *quid pro quo* for tax remittances is one reason that U.S. subsidiaries with a Japanese parent corporation have apparently shifted taxable income to Japan even when the Japanese corporation tax rate was higher than the U.S. rate.

¹⁴ If there were fixed wealth, a residence-based tax on wealth, which in theory would create no incentive for shifting real or tax location, would raise revenue with no efficiency cost. Residence-based taxes are, though, costly to implement.

elasticity of the tax base, i.e., the elasticity that obtains with optimal attention to the private cost of shifting.

Taking action to limit shifting is even more attractive when the added private costs are not social costs, as would be the case for pecuniary penalties levied on detected shifting deemed to be illegal. The fines are costs to the taxpayer, but are (just) a transfer from the national welfare perspective. Several factors limit the magnitude of such penalties, including the private risk created.

Now allow both real capital mobility and shifting of the tax base in a small, capital-exporting jurisdiction. The tax saving from having the possibility to shift the tax location reduces the effective tax rate on domestic capital, and so mitigates the capital flight caused by a given tax rate. But it increases the tax location shifting, and in sum must increase the revenue leakage from taxing domestic capital, making capital tax less attractive than otherwise. As is true without real mobility, the government may want to expend real resources (and especially increase private costs that are not social costs) to make base shifting less attractive.

Finally, assume further, as in Grubert and Slemrod (1998), that not only is the private cost of shifting convex in the amount of shifting but that it declines, for a given amount of shifting, with the amount of real capital exported; this latter assumption is consistent with it being easier to justify foreign taxable income when more real capital is actually abroad. This provides an implicit marginal subsidy to capital export, due to what Slemrod (2001) calls an *avoidance-facilitating effect* of real decisions, which in this context is a shifting-facilitating effect. To some extent this offsets the inefficiency due to real capital flight, but does so at the expense of revenue and the social cost of implementing shifting.

4. Optimal Taxation--Global Welfare

Because of fiscal spillovers, each jurisdiction pursuing optimal policy will not in general lead to policy that is optimal from a global perspective. To visualize one aspect of this, imagine a map that indicates by shading the intensity of a particular economic activity. Such a map would feature shading at certain areas, such as mouths of rivers, near arable land and water sources, natural resources, areas of particularly favorable

weather, and so on. One would also see shading around what seem like arbitrary lines, which are jurisdictional borders. For example, one would see intense coloration on a map depicting retail liquor sales just on the New Hampshire side of the Massachusetts border. This is not consistent with any model of optimal allocation without multiple jurisdictions pursuing uncoordinated policies.

Mobility is generally a good thing. Factors can be moved where they are most productive, goods can be consumed where they are most valued, people can move to where they have the highest utility (which may be near where they are most productive). Why there are 200+ countries and tens of thousands of sub-national jurisdictions, and therefore why there are allocations that appear not to be globally efficient, is well beyond the scope of this paper. So is the optimal fiscal federalism question of the appropriate jurisdictional division of taxing and regulatory powers. It may be that the distortions that arise from the cacophonous tax structures of multiple jurisdictions is close to a second-best optimum once the advantages of having many jurisdictions are considered.¹⁵

The global welfare consequences of multiple taxing jurisdictions and resulting fiscal externalities have been extensively addressed, and are ably summarized in, for example, Wilson (1999). For the most part, that literature has been concerned with the mobility of real capital, and not the manipulation of location for tax purposes. Tax havens provide an example of the latter, and some recent optimal tax literature examines their implications for global welfare and coordinated multilateral policy initiatives.

Tax Havens

A tax haven is a jurisdiction that levies no or only nominal taxes and offers itself as a vehicle for non-residents to escape tax in their country of residence. A tax haven can offer this service because it has laws and administrative practices that prevent the effective exchange of information on taxpayers benefiting from the low-tax jurisdiction.

¹⁵ The first-best global optimum might not, though, feature the kind of policy “notches” at borders when a tax base is subject to a discrete set of rules depending on its location, rather than a linear combination depending on how close the tax base is to two country capitals, for example. For example, why doesn’t the Massachusetts alcohol tax decrease as the proximity of the retail sale to the (lower-tax) New Hampshire border increases?

There is considerable concern that the havens are “parasitic” on the tax revenues of the non-haven countries, inducing them to expend real resources in defending their revenue base and in the process reducing the welfare of their residents. A 1998 OECD report concluded that “governments cannot stand back while their tax bases are eroded through the actions of countries which offer taxpayers ways to exploit tax havens [and preferential regimes] to reduce the tax that would otherwise be payable to them.”

In sharp contrast to this longstanding concern about the deleterious effects of havens, recent normative economic theory has focused on a potentially beneficial role for tax havens. The starting point is the result discussed earlier that, under certain conditions, a small open economy should levy no distorting tax on mobile factors such as capital. Countries do, however, levy distorting taxes on mobile capital, and much of the recent theoretical literature conceives of tax havens as a device to save these countries from themselves, by providing them with a way to move toward the non-distorting tax regime they should, but for some reason cannot, explicitly enact.

In a recent paper with Jay Wilson (Slemrod and Wilson, 2007) we develop a model of tax competition in the presence of tax havens that explains and justifies initiatives to limit haven activities. We model the decision of a country to become a haven and, in so doing, demonstrate that small countries have a greater incentive to become havens; this obtains because the revenues they can obtain are independent of their size, but the costs (of an otherwise suboptimal tax system) are proportional to size.¹⁶

In the model the countries that choose to be havens are parasitic on the revenues of the non-haven countries, in that they are juridical entrepreneurs that sell multinational corporations protection from home-country taxation, resulting in what some political scientists call the “commercialization of state sovereignty.” They are, in essence, establishments in the “tax business.” The equilibrium price for this service depends on the demand for such protection, which in turn depends on the tax system, including the resources devoted to tax enforcement by the non-haven countries, and on the technology

¹⁶ In other models that allow asymmetric jurisdiction sizes small countries choose lower tax rates in equilibrium. In Bucovetsky (1991) and Wilson (1991), the cost of capital for large countries is less sensitive to tax changes compared to small countries because of their own tax policy’s effect on the world rate of interest, and so will choose a higher tax rate. Indeed, residents of the small country can end up better off in the presence of capital competition than in its absence. Small countries may also benefit from competition in the presence of cross-border shopping, as demonstrated by Kanbur and Keen (1993).

available to the parasitic havens. Note then that, in this model, the non-haven countries choose not only their tax rate structure, but how staunchly to defend their revenue base against tax location mobility.

In the model, tax havens lead to the wasteful expenditure of resources, both by firms in their participation in havens and by governments in their attempts to enforce their tax codes. In addition, tax havens worsen tax competition problems by causing countries to further reduce their tax rates below levels that are efficient from the viewpoint of all countries combined. Either full or partial elimination of havens is found to be welfare-improving for the residents of non-haven countries. Most strikingly, initiatives to limit some, but not all, havens can be designed to make residents of *all* countries better off, including residents of the remaining havens, who can now receive more for their services due to restricted supply.

The Slemrod and Wilson (2007) model of tax havens is by no means a general model of globally optimal taxation in the presence of *tax* location mobility, in addition to real location mobility. Nor has such a model been developed.¹⁷ It does, though, suggest what elements such a general model would need to have:

- the possibility of tax base movement without real factor movement, although the latter may facilitate the former.
- expenditure of real resources can limit the attractiveness of movement from one jurisdiction's perspective.
- from a global perspective, inefficiently large incentives for private actors to acquire tax location mobility and to defend their tax base.

5. Equity

Optimal tax theory can address equity considerations by specifying varying social weights that apply to the utilities of individuals; concern for equality would suggest that the social weight be higher, the lower is an individual's level of well-being. A policy maker of a single jurisdiction, or one concerned with global social welfare, may consider equity issues.

¹⁷ Although see, for example, Cremer and Gahvari (2000) for a model with tax evasion and optimal enforcement in a multi-country setting.

5.1. Within-Jurisdiction Equity

Equity issues raise several new questions regarding the place of mobility in optimal taxation. Perhaps the most fundamental is the question of whose welfare should be considered by a single jurisdiction in the presence of mobility of people, a topic addressed by, for example, Wilson (1980). To be specific, if an individual emigrates should their welfare no longer matter? This question figures prominently in evaluating home-country policies that address the “brain drain” of talented individuals from developing countries. For example, in Wilson’s (1980) analysis of optimal income tax progressivity in the presence of emigration, consideration of individuals’ utility is independent of whether they are residents or emigrants. But the emigrants pay no income tax, and their number varies as the income tax changes. The economy modeled is “partially closed,” in that a certain fraction, which may vary by ability level, may not enter or leave. Potential emigration (a higher ratio who can leave or enter) at relatively high or low ability levels reduces the optimal progressivity, while potential emigration at middle ability levels increases optimal progressivity. Perhaps not surprisingly, in the empirically most likely case—when it is high-ability individuals who are most mobile—optimal progressivity from one jurisdiction’s perspective falls.¹⁸

Note that this type of argument does not apply directly to the policy implications of the mobility of the residence of corporations, as the profits of these legal persons do not enter into a social welfare function directly. However, *ceteris paribus* any tax increase on resident corporations will be less attractive, the greater is the leakage of revenue arising from corporate residence mobility. In addition, when the legal residence is determined by the real location of headquarters operations, the tax location decision is linked with real location decisions, as discussed above.¹⁹

5.2. Global Equity

Vertical Equity

¹⁸ That potential emigration may undermine the argument for progressivity echoes the concern of Sinn (1997) that openness undermines the welfare state.

¹⁹ Of note is the argument in Kane and Rock (2007) that corporate tax differences across countries can distort the efficiency of the market for corporate charters that determine governance rules.

By far the major source, more than three-quarters, of inequality among the people of the world stems from cross-country differences in mean country income, rather than the inequality within countries.²⁰ This suggests that, even if each country values less dispersion in incomes (i.e., has a concave social welfare function), each country's tax progressivity decisions may have little effect on worldwide inequality. Kopczuk, Slemrod, and Yitzhaki (2005) quantify this issue in a highly stylized model by comparing the consequences of domestically optimal income tax systems to a world income tax that optimizes using the same social welfare function and utility functions that each country would use in its domestic welfare optimization. Simulations reveal that the decentralized tax-and-transfer systems (without cross-country transfers) make hardly any dent in world income inequality, reducing the world Gini coefficient of consumption from 0.695 to 0.689. In sharp contrast, the optimal world income tax would reduce the world Gini to 0.25. Although under a world income tax the deadweight loss is also much higher than would occur under a decentralized system, it also achieves a much better targeting of transfers by not providing tax relief to people who are poor from a country's perspective but not from a world perspective. For example, the deadweight losses caused by progressivity in the U.S. income tax buy relatively little when judged against a concave world social welfare function, because for the most part it redistributes from the very, very rich to the very rich, globally. Because of this consequence of decentralized governments, a global planner would want to consider not only how cross-border mobility affects the efficiency of tax systems, but also how it affects the distribution of welfare gains across countries of different mean income. For example, if allowing tax havens effectively transferred resources from rich to poor countries, this could conceivably be a part of a second- or third-best outcome in the absence of other means of cross-country transfers; the evidence is, alas, clearer regarding the benefits to small, countries, as opposed to poor countries. Indeed, there is some evidence that the poorest countries do not effectively acquire the potential benefits from the commercialization of

²⁰ This claim is documented in Milanovic (2005).

state sovereignty, including being a tax haven but also pursuing activities such as issuing postage stamps sold to the international philatelic market.²¹

Horizontal Equity

I close by raising a global horizontal equity issue. I can see no reason why, from a global perspective, there should be a lower tax on individuals who are more cross-jurisdictionally mobile.²² In particular, I can see no moral basis for differentiating taxation on the basis of mobility. Yet this will almost certainly occur in a decentralized setting. The reason it does is captured nicely by the American pundit George Will, who recently wrote (in a completely different context, of course) that “there is no moral duty to do what cannot be done.” Small open economies cannot, or cannot at low cost, tax mobile factors, even if they might want to.

6. Conclusions

The theory of optimal taxation counsels that, *ceteris paribus*, jurisdictions should avoid taxing elastic tax bases. Because cross-jurisdictional mobility is one component of elasticity, an optimal tax system will, other things equal, rely less on mobile tax bases.

Most models of optimal tax with mobility deal only with real mobility, in the sense that moving out a jurisdiction’s tax base entails a physical movement, as well. But often escaping a jurisdiction’s tax net does not necessarily entail any physical movement, is often an avoidance (or even evasion) device, and can be accomplished by the “mere stroke of a pen.” The cost of such movement, and therefore the base elasticity, is endogenous to both private agent actions and government policy actions. In part because enforcement of tax base avoidance does not necessarily preclude residents from access to productive alternatives, optimal enforcement becomes an important concern.

Because of fiscal externalities, each country pursuing its optimal policies generally will not lead to a globally optimal situation. This is especially true in the presence of tax location mobility, where some countries have an incentive to undertake costly actions to

²¹ For evidence on which countries pursue benign and malign examples of the commercialization of state sovereignty, including tax haven status and postage stamp issuance, see Slemrod (2008).

²² In Section 2.1 I argued that, because mobility may increase the cost of collecting tax, a lower tax on mobile tax bases may be an efficient outcome. But that argument did not apply specifically to mobility across jurisdictions.

attract tax base, and others have the incentive to expend resources to defend their tax base. Tax havens are an intriguing example of this dynamic. Because real movement and tax movement are often complementary, models that can accommodate both are the most promising for future research development.

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