SHOULD TAX POLICY TARGET MULTINATIONAL FIRM HEADQUARTERS?

Kimberly A. Clausing

This paper considers the nature of multinational firm headquarters, discussing whether multinational headquarters are a desirable target of tax policy. Prior literature suggests that multinational firms are sensitive to tax policy considerations in headquarters location decisions. Fortune 500 lists of the world’s largest firms show informative patterns of headquarters location, but there is little systematic relationship between these firms’ headquarters locations and tax policy variables. Similarly, there is an ambiguous relationship between indicators of country-wide scientific achievement and tax variables. Implications for tax policy are discussed, with an emphasis on the interaction between increasing economic integration and tax policy design.

Keywords: international taxation, multinational firm headquarters, international tax policy, international tax systems, tax competition

JEL Codes: H25, H26, H87

I. INTRODUCTION

International tax policy discussions frequently illuminate important policy tradeoffs. Tax revenue needs are balanced against concerns regarding efficient capital allocation and the competitiveness of home country multinational firms. For example, since U.S. based multinational firms are taxed on their foreign income, there is a concern that they will be tax disadvantaged relative to multinational firms based in countries that exempt foreign income. There is also a concern that high U.S. corporate tax rates and our worldwide tax system may result in multinational firms resorting to corporate inversions in order to reduce their worldwide tax burden.¹

These concerns have lead some to advocate that the United States adopt an exemption system of international taxation. Still, it is likely that moving to an exemption

¹ Corporate inversions are intended to relocate the tax residence of corporations overseas by making the previous parent firm an affiliate of a foreign parent firm. Some legal measures have been taken to combat inversions. For example, there are provisions under the American Jobs Creation Act of 2004 that result in some types of inverted corporations being considered domestic corporations for tax purposes.

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system would exacerbate the already large incentive for multinational firms to shift profits away from the United States through tax-motivated transfer pricing and other techniques. Since income shifting is already a substantial source of revenue loss for the United States government, there is an important policy tradeoff in a move to an exemption system of taxation.²

What is often lost in these discussions is the nature of multinational firms themselves, their importance to the domestic economy, and the resulting policy considerations. This paper sets an agenda for more careful consideration of several important questions. First, what does it mean to have a multinational firm “headquartered” in a particular economy? Second, should residents care about whether a multinational firm is headquartered in their domestic economy? Aside from issues of pride, what are the economic rationales for using tax policy to influence multinational firms’ headquarters decisions? Third, what does the prior literature suggest about the determinants of firm headquarters, and how sensitive are headquarters locations to tax policy parameters? Fourth, what can we learn about this question by examining the behavior of the world’s largest 500 corporations over the past twenty years? Finally, how does the pattern of headquarters across countries compare to the pattern of indicators of scientific progress?

While the current paper is merely suggestive of future research questions, it does point to some preliminary observations. Multinational firm headquarters are a complex and international concept, as firms may increasingly choose to locate their financial, tax, and operational headquarters across national boundaries. Attracting and retaining multinational firm headquarters may be an important policy goal, if multinational firm headquarters generate important external effects that are difficult to target directly. The prior literature suggests that multinational firms are sensitive to tax considerations in their headquarters location decisions, although trends in Fortune 500 global firms make it difficult to discern substantial tax influences over prior decades, and indicators of scientific progress are not systematically related to tax policy variables.

In addition to suggesting an agenda for future research, these observations shed light on ideal international tax policy design. International tax systems should acknowledge the globally integrated nature of the world economy, and they should be designed to reduce the importance of arbitrary financial and organizational decisions of multinational firms.

II. WHAT IS A MULTINATIONAL FIRM HEADQUARTERS?

In a global economy, the location of a multinational firm’s headquarters may be difficult to classify. Many define headquarters location based on financial reporting information. These locations are typically the place where the firm’s stock is traded. For example, under U.S. federal securities laws, publicly traded firms must file specific financial reports on a regular basis, conforming to the requirements of the U.S. Securities and Exchange Commission.

² For example, Clausing (2009) finds that income shifting cost the U.S. Treasury over $60 billion in 2004.
One could also consider a firm’s legal residence for tax purposes as the measure of headquarters. The United States determines domicile as the legal residence or place of incorporation, but other countries define domicile differently; e.g., the United Kingdom defines domicile as the location of operational headquarters. The latter definition raises its own questions of interpretation. For example, how should one classify a firm when the location of operational headquarters is spread across national boundaries?

Consider the following possible definitions of firm headquarters, which raise associated questions.

1. Legal: Where is the firm legally incorporated? Where is it resident for tax purposes? Which jurisdiction’s regulations apply?
2. Financial: Where are the firm shares traded? Is the firm listed on more than one stock exchange? Where does the firm submit financial reporting? Where do most of the firm’s shareholders reside?
3. Managerial: Where do the CEO and the Board of Directors reside? Where are the main headquarters operations located? Does this differ depending on the operation?

As is immediately apparent, for most multinational firms, there is unlikely to be a single answer to all of the above questions. In part, this ambiguity is due to the very nature of multinational firms, as such firms have found it optimal to spread operations across national boundaries. Yet even beyond traditional divisions of activities among countries, the location of the headquarters themselves has become increasingly scattered in recent years.

Desai (2009) describes several specific examples of firms that have chosen to separate their headquarters functions across multiple countries. For example, Genpact originated as a subsidiary of General Electric in 1997. In 2005, it became an independent company. In 2007, Genpact was listed as a publicly traded firm with a listing on the NYSE (so it is subject to U.S. SEC filing requirements). Yet most of its managerial functions are in India, and it has a corporate headquarters of Bermuda. It operates in 13 countries with 38,600 employees and $1.1 billion in revenue. Is it a U.S., Indian, or Bermudan headquartered firm?

Indeed, it may be profitable for a firm to split headquarters functions across countries. Even though coordination costs may increase, there may be large offsetting benefits. Listing on a stock exchange with good investor protections may lower the perceived risk associated with shares, thus reducing financing costs. Choice of financial location may also affect the size and composition of the investor base, especially when institutional investors are limited in their foreign holdings. As discussed in Desai (2009), some firms are cross-listed, with more than one financial identity.

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Further, countries may have natural comparative advantages in different types of managerial expertise, so a firm may find it optimal to locate marketing near customers, finance near financial markets, and IT near areas of computing expertise. Also, low-tax countries, such as Bermuda, may be particularly attractive locations in which to reside for tax purposes. For example, Dischinger and Riedel (2008) provide convincing evidence that multinational firms are adept at locating intangible assets, and the associated income, in low-tax locations.4

III. WHAT ARE THE CONSEQUENCES OF HEADQUARTERS LOCATION?

A. Possible Beneficial Effects

The above discussion reveals a great deal of ambiguity regarding what it means to have a multinational firm headquarters in a particular country. Even beyond that ambiguity, there remains a crucial question concerning whether multinational firm headquarters are per se desirable. Several arguments support such a position.

First, and easiest for an economist (but not a politician) to dismiss, are issues of nationalism and pride. When large and well-known multinational firms are headquartered in the home country, it may simply generate pride in the ability of the country’s firms to compete in the world economy. Of course, this simplistic argument begs a number of other questions. Why? What is special about having multinational firm headquarters that would instill the pride in the first place? We are left needing a deeper explanation.

Second, perhaps it is the very activities of the multinational firm headquarters themselves that are desirable. Job creation stimulates economic activity; investment builds the capital stock, enabling future productivity and growth. Of course, most economists would argue that the level of employment and the amount of investment are fundamentally macroeconomic phenomena. The overall levels of these aggregates are thus more likely to be influenced by macroeconomic variables: the stance of monetary and fiscal policy, interest rates, exchange rates, savings rates, and the overall state of aggregate demand relative to aggregate supply.

Still, one can argue that multinational firm headquarters are important not so much for influencing the level of jobs or investment, but for influencing the type of jobs or investment. In particular, the sorts of activities that multinational firm headquarters undertake may be particularly special. First, multinational firm headquarters are more likely to generate learning and innovation, since research, development, and entrepreneurial activities are headquarters activities. Second, multinational firms may be more likely to generate excess profits due to their size, market power, and firm-specific knowledge.

Finally, headquarters are more likely to be the locations of high wage jobs. In fact, a large literature suggests that wages may exceed the marginal product of labor due to

4 As they discuss, these strategies may also facilitate profit shifting more generally, due to ambiguities surrounding the pricing of intangible assets. The extent to which the holding of intangible assets affects the real location of R&D activity is not immediately apparent from the current literature.
efficiency wages or the presence of labor rents. Economic rents are often shared with workers, as evidence regarding interindustry wage differentials has persistently shown. For example, Budd, Konings, and Slaughter (2005) cite many such studies, and they extend this literature to consider how economic rents may be shared across affiliates in multinational firms.5

All three of these arguments are particularly persuasive if the special nature of multinational headquarters activities spills over to the economy at large and are not appropriated solely by the firm, its shareholders, and its workers. For example, if research and development generates learning that benefits other firms and that increases economy-wide productivity, then there are external benefits that could justify policy attention.

Similarly, if excess profits or rents affect the economy more widely through enhanced government revenues, increased funds for innovation, or other spillovers, they may be socially desirable. Although economic theory generally suggests that competitive outcomes are more efficient than those that involve monopolistic distortion, it may still be desirable to ensure that excess profits are earned domestically. Also, some literature suggests that firms with market power are more likely to innovate.

Dischinger and Riedel (2009) provide evidence regarding the nature of multinational firm headquarters, using a large firm-level dataset (Amadeus data) of European firms to study the profitability of headquarters firms relative to their subsidiaries. They find that headquarters firms are more profitable, although the gap between headquarters and subsidiary profitability is diminishing over time. They attribute the gap to the higher agency costs and lower competitiveness of subsidiaries, whereas headquarters firms may know the local market better. The gap is about 30 percent and is robust to the inclusion of a large number of controls. This suggests that multinational headquarters will generate larger profits, higher wages and labor rents, and greater tax payments.

Thus, from the perspective of government policy, assuming a goal of maximum national welfare, it remains unclear whether to target multinational firm headquarters with policy measures. National pride may provide one rationale, but it is an economically weak one. Economic activity as a whole is likely determined by macroeconomic factors. Also, to the extent that headquarters generate useful economic spillovers, it may be most efficient to encourage those spillover-generating activities directly.

As Bhagwati (1971) long ago established, it is more efficient to attack distortions directly in economic policy making. If research and development are the desiderata, for example, it is better to subsidize them directly than to subsidize entities that may or may not undertake disproportionate amounts of research and development. Targeting policy goals directly is more efficient, since targeting policy goals indirectly generates unwelcome consequences. For example, subsidizing headquarters may provide excess encouragement to headquarters activities that do not involve positive spillovers to the broader economy as well as those activities that do.

5 Using the Amadeus dataset on European multinational firms between 1993 and 1998, they find that parent firm profits are shared not just with parent workers, but also with majority-owned affiliate workers.
B. Government Revenue

Governments have the additional concern of corporate tax revenue. Revenues are determined by the location where multinational firms book their profits, and there is substantial evidence that firms are tax sensitive in their decisions regarding where income is reported; see de Mooij (2005) for an overview. In addition to the country’s corporate tax rate, the nature of the country’s tax system will affect the taxation of multinational firms. Some countries use an exemption system, exempting the foreign income of their resident firms. Others, such as the United States, employ a worldwide tax system (also called a credit system), taxing foreign income once it is repatriated and offering a tax credit for taxes paid to foreign governments. Many countries also operate hybrid systems that exempt some types of income, but that also tax other types of foreign income.

These considerations indicate that policy makers may have competing aims when they consider tax policy toward multinational firms. Encouraging multinational firm headquarters activities domestically may suggest that policy makers should tax the income of multinational firms lightly. These arguments may hold particular sway in a second best environment where it is not possible to “attack the distortion directly.” Indeed, U.S. based multinational firms have repeatedly recommended lower U.S. corporate tax rates, and many have suggested moving to a system that exempts the foreign income of U.S. based firms. These arguments are often premised on the desirability of multinational firm headquarters activities. Yet revenue considerations may provide an important and possibly competing consideration. For instance, there is some evidence that exemption countries raise less revenue from the corporate tax than worldwide tax system countries, although there remain questions regarding the revenue-maximizing corporate tax rate.6

Finally, there is a strong argument for separating decisions regarding the optimal taxation of multinational firm income from the legal and financial arrangements of multinational firms. Ideally, taxation of multinational firm income should be based as closely as possible on where the income is earned, rather than basing tax liabilities on tax-motivated decisions concerning finance, legal and organizational form, or accounting. Indeed, there is a vast body of empirical research on taxation that suggests a hierarchy of behavioral responses.7 Taxpayers are most responsive when the timing of transactions affects taxation, and are also responsive in undertaking financial or accounting responses to taxation; real economic decisions are far less responsive to taxation.

In this context, I have previously argued that formulary apportionment would provide a better approximation than our present system (Avi-Yonah and Clausing, 2008). While

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6 Clausing (2007, 2008) presents analysis on these questions. Corporate tax revenues are lower (relative to GDP) for exemption or hybrid countries, relative to credit countries, controlling for the tax rate, the square of the tax rate, and other economic variables. Of course, it is important to note that the revenue-maximizing tax rate is unlikely to be the socially optimal tax rate.

7 One summary of such work can be found in Slemrod and Bakija (2008).
formulary apportionment would have its own flaws, there is ample evidence that our current system of multinational taxation does not provide even a rough approximation of where income is earned. As just one simple example, if one considers the top 10 profit locations for U.S. multinational firms in 2005, based on the share of worldwide (non-U.S.) profits earned in each location, eight of the top 10 profit countries are locations with effective tax rates of less than 10 percent.8

Also, at present, a multinational firm’s tax burden is unduly affected by its legal and organizational form. For example, in the United States, deferral of taxation on foreign income is allowed for subsidiary firms but not for branch firms. Also, the location of corporate headquarters for tax purposes can have large effects on tax liabilities. For example, Seida and Wempe (2004) demonstrate that multinational firms face much lower effective tax burdens after corporate inversions, a finding that they attribute to earnings stripping.

IV. PRIOR LITERATURE ON MULTINATIONAL FIRM HEADQUARTERS

Much of the prior work on multinational firm headquarters decisions has focused on the effects of taxation. However, work from the field of Economic Geography also provides a useful starting point. Krugman (1991) develops a seminal model, where the pattern of economic activity and industrial clusters depends on the interaction of economies of scale, transportation costs, and the share of manufacturing in expenditure relative to agriculture.

Models such as Baldwin and Krugman (2004) and Haufler and Wooten (1999) have emphasized that agglomeration effects may help insulate core nations from the effects of tax competition, allowing them to set higher tax rates without losing capital. This suggests that country size may have an interactive effect with tax rates, such that high tax rates are more likely to deter multinational firms in small countries. Baldwin and Okubo (2009) also model how tax motives for firm relocation are affected by firm size. They find that large firms are more likely to relocate in reaction to high taxes.

There has been some empirical work on multinational firm headquarters decisions. Becker, Egger, and Merlo (2009) focus on multinational firms with German headquarters. They use data on more than 11,000 German municipalities to examine the tax sensitivity of multinational companies with headquarters in Germany. They find that headquarters are substantially responsive to municipal level taxation.

Three recent papers employ large scale firm-level data: Barrios et al. (2009), Huizinga and Voget (2009), and Voget (2009). Barrios et al. use data from the Amadeus database for European firms over the period 1999–2003. They analyze how home and host country taxation as well as withholding taxes affect the location of new foreign

8 Clausing (2009) provides more details on these (and other related) figures. Approximately 45 percent of all foreign profits are earned in just five of these countries (Netherlands, Luxembourg, Bermuda, Ireland, and Switzerland), countries with a combined population less than two-thirds that of Spain.
subsidiaries. They find a large influence of both host and home country taxation, but no evidence of withholding tax effects. A similar paper by Huizinga and Voget (2009) finds that the structure of parent-subsidiary organization following mergers and acquisitions is influenced by the tax rates and tax systems of the two countries in question; firms systematically choose arrangements that reduce their worldwide tax liabilities, avoiding headquartering firms in countries with high international tax burdens. Voget (2009) analyzes data on firms from the Orbis and Zephyr databases over the period 1997–2007, studying in particular the subset of multinational firms that have relocated their headquarters. Both controlled foreign corporation (CFC) legislation (such as subpart F) and increased repatriation tax rates are found to increase the likelihood of multinational firm relocation.9

Dischinger and Riedel (2010) also consider the role of headquarters in profit shifting behavior. Using the Amadeus dataset for European multinational firms for 1995–2007, they find that profit shifting is more likely to go towards headquarters firms, controlling for tax differences among countries. They hypothesize that this is due to agency issues that generate an incentive to keep profits in the headquarters location. For a given tax rate difference, income shifting is about 50 percent smaller if the headquarters country is the high-tax country. Thus, governments may attempt to target multinational firm headquarters in order to protect their tax base, as income shifting favors headquarters destinations.

V. THE WORLD’S LARGEST FIRMS

To examine the location of headquarters, I begin with data from Fortune magazine on the world’s largest 500 firms.10 Fortune ranks firms based on revenues (in dollars, or converted into dollars from local currency). Comparable lists are available from 1990–2008. Companies are classified with respect to a home country based on financial reporting; for U.S. firms, companies that produce a 10-K are included. In some cases, firms are explicitly noted to have an ambiguous headquarters. For example, the world’s

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9 Much of the prior work on the effects of tax rates and (exemption and worldwide) tax systems has focused on foreign direct investment rather than headquarters. de Mooij and Ederven (2003) perform a meta-analysis of 25 studies of foreign direct investment tax elasticities over the period 1984 to 2001. They find that the median value of the tax rate semi-elasticity is 3.3, indicating that a one percentage point reduction in the host country tax rate raises foreign direct investment by 3.3 percent. They also note that the elasticities of the reviewed studies increase over time. Their analysis indicates that elasticities in studies where foreign direct investment flows originate in exemption countries are no larger than those in studies where the investment originates in credit countries. This result is limited to the subset of the analysis that removes extreme observations.

10 An alternative list is provided by Forbes, which ranks the top-2000 firms worldwide. The list is only available since 2003. In this list, firms are ranked by a composite of sales, profits, assets, and market value. For greater coverage, one could also analyze the financial databases. The more detailed studies above rely on data from Amadeus, compiled by Bureau van Dijk, and only available by (expensive) subscription. The Amadeus data cover more than ten thousand European multinational groups, with tens of thousands of subsidiaries. Similar data are also available (by subscription) for U.S. multinational firms from Standard and Poor’s Compustat.
top firm in 2008 is Royal Dutch Shell, which is incorporated in Britain with executive offices in the Netherlands.\textsuperscript{11}

A focus on the world’s largest firms is interesting for several reasons. First, as Baldwin and Okubo (2009) suggest, larger firms may be particularly likely to relocate in response to high taxes. Second, Fortune 500 firms are economically important. Together, the world’s largest 500 firms had sales revenues in excess of $25 trillion in 2008 and profits in excess of $820 billion. As a comparison, world GDP is approximately $60 trillion. (Of course the same GDP can appear as multiple firms’ revenues, as firms often produce intermediate products.)

Table 1 lists the 18 countries where the most top-500 firms are headquartered in 2008. The United States has 140 top-500 firms, and Japan has 68, followed by France

<table>
<thead>
<tr>
<th>Country</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>140</td>
</tr>
<tr>
<td>Japan</td>
<td>68</td>
</tr>
<tr>
<td>France</td>
<td>40</td>
</tr>
<tr>
<td>Germany</td>
<td>39</td>
</tr>
<tr>
<td>China</td>
<td>37</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>27</td>
</tr>
<tr>
<td>Switzerland</td>
<td>15</td>
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<tr>
<td>Canada</td>
<td>14</td>
</tr>
<tr>
<td>Korea</td>
<td>14</td>
</tr>
<tr>
<td>Netherlands</td>
<td>12</td>
</tr>
<tr>
<td>Spain</td>
<td>12</td>
</tr>
<tr>
<td>Italy</td>
<td>10</td>
</tr>
<tr>
<td>Australia</td>
<td>9</td>
</tr>
<tr>
<td>Russia</td>
<td>8</td>
</tr>
<tr>
<td>India</td>
<td>7</td>
</tr>
<tr>
<td>Sweden</td>
<td>6</td>
</tr>
<tr>
<td>Brazil</td>
<td>6</td>
</tr>
<tr>
<td>Belgium</td>
<td>5</td>
</tr>
</tbody>
</table>

\textsuperscript{11} Five other firms are footnoted due to ambiguous headquarters. At rank 138 is Bunge, which is incorporated in Bermuda with executive offices in the United States. At rank 320 is Xstrata, incorporated in Britain with executive offices in Switzerland. At rank 328 is Schlumberger, incorporated in Netherlands Antilles with executive offices in the United States. At rank 433 is Tyco International, which changed its place of incorporation from Bermuda to Switzerland in 2009. At rank 454 is Evraz Group, registered in Luxembourg with executive offices in Russia.
(40), Germany (39), China (37), and the United Kingdom (27). There is a great deal of concentration in firm headquarters location; of the top 500 firms, 94 percent of them are located in just 18 countries. Figure 1 shows the trend since 1990 for the United States and Japan (Panel A) and the other countries with more than 25 headquarters at the end of the sample (Panel B). For the United States, there is a clear trend of more
top headquarters from 1994–2001, followed by a decline since 2001. Japan has been showing a steady decline since 1994, and China has been showing a steady increase. Most other countries do not show particularly strong trends.

Trends are similar if one considers a measure that accounts for the size of firms, such as the total sales of top-500 firms. Figure 2 shows the countries that have more than two percent of the total top-500 firm sales in 2008. The pattern of changes for the United States, Japan, and China is consistent with the count data. Figure 3 shows sales in constant 2000 dollars. This figure reveals a general upward trend in the importance of top-500 firms, but the relative trends among countries remain similar.

In general, no particularly surprising patterns emerge from this analysis. However, from a tax policy perspective, it may be informative to investigate whether changes in the locations of Fortune 500 firms are related to changes in tax rates or tax systems. Figure 4 shows the share of firms that are headquartered in countries that use a credit (or worldwide) system to tax their resident multinational firms. This figure assumes that firms headquarters for tax purposes are the same as their financial reporting headquarters, as listed by Fortune. While that assumption generally holds, it may not be true in all cases, as discussed above. During this period, there is a decrease in the share of Fortune 500 firms that are headquartered in credit countries, from approximately 70 percent in 1990 to about 65 percent in 2007. Of course, these percentages may change dramatically in subsequent years, as Japan and the UK adopt changes in their tax systems.

In Tables 2 and 3, a very simple regression analysis is used to consider the impact of tax and economic variables on the location of Fortune 500 firm headquarters across countries over the time period 1990–2007. The sample consists of approximately 70 countries for which corporate tax rate data are available, although many countries do not report any Fortune 500 firms. In addition to considering the count of such firms (column 1), the analysis also considers the total profits of top 500 firms in column 2, the total sales revenues of top 500 firms (column 3), the assets of these firms (column 4), and employment (column 5). Fortune reports ranks and revenues in all years, but only reports assets and employment prior to 2003. Profits are reported in all years aside from 2003 and 2004.

In Table 2, baseline specifications consider the effect of economic size (captured by real GDP), economic development (captured by real GDP per-capita), and the corporate tax rate. Most variables are in natural log form. GDP and GDP per-capita have their expected effect. An economy one percent larger is associated with 0.4 percent more Fortune 500 firms, and between 1.3 and 2.0 percent more economic activity (profits, sales, assets, and employment) within those firms. GDP per-capita also has a positive and statistically significant impact on Fortune 500 activity. The tax rate has a surprisingly positive effect. This result is robust to the exclusion of the United States.12

Interestingly, if an interaction term is included between the tax rate and country size (measured by GDP), the tax coefficient becomes statistically significantly negative, while the interaction term is positive, providing some support for the theoretical insights of Baldwin and Krugman (2004) and Haufler and Wooten (1999). High tax rates may discourage multinational headquarters for small countries, but not for large ones. In the

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12 Results without the United States are available upon request.
Figure 2
Panel A: Share of Sales by Top 500 Firms, by Headquarters Country, United States and Japan

Panel B: Other Top Headquarters Countries
Figure 3
Panel A: Sales by Top 500 Firms in Constant 2000 USD (billions)
United States and Japan

Panel B: Other Top Countries
Figure 4
Share of Top 500 Firms, by Tax System

Table 2
Determinants of Fortune Headquarters Measures, 1990–2007

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Profits</th>
<th>Sales</th>
<th>Assets</th>
<th>Employ</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>ln(gdp)</td>
<td>0.434</td>
<td>1.314</td>
<td>1.99</td>
<td>1.63</td>
<td>1.928</td>
<td>0.172</td>
</tr>
<tr>
<td></td>
<td>(0.014)**</td>
<td>(0.064)**</td>
<td>(0.063)**</td>
<td>(0.085)**</td>
<td>(0.085)**</td>
<td>(0.039)**</td>
</tr>
<tr>
<td>ln(gdppc)</td>
<td>0.242</td>
<td>0.635</td>
<td>1.119</td>
<td>1.009</td>
<td>1.021</td>
<td>0.226</td>
</tr>
<tr>
<td></td>
<td>(0.019)**</td>
<td>(0.089)**</td>
<td>(0.086)**</td>
<td>(0.115)**</td>
<td>(0.115)**</td>
<td>(0.019)**</td>
</tr>
<tr>
<td>tax rate</td>
<td>0.782</td>
<td>2.79</td>
<td>4.901</td>
<td>8.477</td>
<td>7.319</td>
<td>-8.22</td>
</tr>
<tr>
<td></td>
<td>(0.262)**</td>
<td>(1.22)†</td>
<td>(1.20)**</td>
<td>(1.584)**</td>
<td>(1.596)**</td>
<td>(1.28)**</td>
</tr>
<tr>
<td>ln(gdp)*tax</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.854</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.119)**</td>
</tr>
<tr>
<td>Observations</td>
<td>1239</td>
<td>1094</td>
<td>1239</td>
<td>944</td>
<td>944</td>
<td>1239</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.60</td>
<td>0.40</td>
<td>0.60</td>
<td>0.47</td>
<td>0.52</td>
<td>0.62</td>
</tr>
</tbody>
</table>

Note: Asterisks indicate statistical significance at the 5% (*) and 1% (**) levels. All dependent variables are in natural logs.
specification describing the count of top firms, the negative tax rate effect is dominant for the economically smallest 20 percent of the countries in the sample. Results for the column 1 specification with this interaction term are included in column 6.\(^{13}\)

Table 3 includes more tax measures: (1) dummy variables indicate whether the country has an exemption or hybrid system of taxing its resident multinational firms, distinguishing such countries from worldwide/credit countries and (2) a dummy variable indicates if the country has a CFC law. It is a common perception that multinational firms will, ceteris paribus, prefer to be headquartered in countries that exempt foreign income as well as those countries without CFC laws. Thus, exempt and hybrid are hypothesized to have positive coefficients, while CFC law is hypothesized to have a negative coefficient. This table also controls for the geographic remoteness of countries and year-specific fixed effects.

\(^{13}\) For other dependent variables, results are similar. Tax rate coefficients are negative and interaction term coefficients (for the variable tax rate \(*\) lngdp) are positive. The combined results imply negative tax rate effects for the smallest 0–20 percent of the countries in the sample, depending on the specification. Full results are available upon request.
In Table 3, the anomalous tax rate result disappears; the effect of the tax rate becomes statistically insignificant. The change is caused by the inclusion of fewer observations due to the limited country coverage of the additional variables; Table 3 is limited to mostly Organisation for Economic Co-operation and Development (OECD) countries. (If the same specification is run without the additional variables, but with the reduced sample, the tax coefficients remain statistically insignificant.) Thus, there appears to be no statistically discernible effect of the tax rate on Fortune 500 firm locations amongst OECD countries.

Further, most other tax variables do not have a large impact on the presence of Fortune 500 firms. The tax system seldom matters, nor does the existence of CFC laws. The one statistically discernible influence of tax considerations is the positive correlation between a hybrid tax system and the sales or assets of Fortune 500 firms headquartered in a particular country, relative to the omitted group (credit system countries). Yet even these influences of the hybrid variable disappear if country fixed effects are utilized.14 Thus, while this analysis is quite limited in scope, the evidence indicates that the size and wealth of an economy are the primary determinants of multinational firm headquarters. To the extent that tax rates and tax systems matter, their influence is too subtle to be distinguished in this simple analysis.

Given the nature of these data, I also used zero-inflated Poisson specifications for Tables 2 and 3. Since the data include many country/year observations with zero top-500 firms, this method may be appropriate for the data.15 The use of this method does not substantially affect the main conclusions, although all of the tax variables in Table 2 become statistically insignificant, instead of anomalously positive. In Table 3, the two positive coefficients for hybrid become statistically indistinguishable from zero, although the exempt variable takes on a statistically significant positive coefficient in the first column.16

VI. EVIDENCE FROM OECD DATA ON SCIENTIFIC ACTIVITIES

As discussed above, the argument that headquarters activities are economically desirable is closely linked to the possibility that these activities generate beneficial external effects that are not entirely appropriated by the market participants themselves. In this context, research and development may be a particularly valuable activity to have in the domestic economy. The OECD collects several data series that measure scientific activities in member countries, over the period 1985–2006. Two of these series are shown in Figures 5 and 6.

14 Results are available upon request.
15 An excess of zero observations as well as a variance that exceeds the mean for the dependent variables support the possibility of over dispersion in the data.
16 Exempt countries are associated with a higher number of top 500 firms in column one, although they also show an increased probability of having zero top-500 firms. The zero-inflated Poisson model estimates a separate specification for the zero/one probability.
Figure 5

Figure 6
Business R&D Spending in Constant 2000 Millions of Dollars
Figure 5 shows patents by OECD countries for the years between 1990 and 2006, approximately the same time period covered by the *Fortune* data. The United States has 35 percent of all patents in 1990, declining to about 32 percent by 2006. Japan’s share of the total also declines slightly, from 30 percent to 28 percent. Figure 6 shows business research and development spending in millions of constant 2000 U.S. dollars. U.S. spending on business R&D increases from $130 billion to $220 billion over this time period. Most other countries also show increases.

In Figure 7, the data are considered based on the tax system of the host country, separating exemption (together with hybrid) from worldwide systems. The data are scaled by country GDP (in constant dollars) since larger economies are likely to generate more patent activity. In panel (A), the solid line shows patents per trillion dollars of GDP for non-credit (both exemption and hybrid) countries, and the dashed line shows the same measure for credit countries. While non-credit countries have more patents relative to GDP than credit countries, the difference between the two groups narrows over time, particularly in recent years. Panel (B) shows business sector research and development expenditure, scaled by GDP. Here credit and non-credit countries appear similar, overall.

Table 4 reports regressions similar to those of Table 3, using the OECD science measures data. Typically, both tax rates and CFC laws have no effect on most measures of scientific activities. Tax systems have unclear effects. In columns 1 and 2, countries with exemption or hybrid tax systems appear to have more patents. Larger and richer economies also generate more patents, as do countries where businesses invest more in research in development (included as an explanatory variable in column 2). In column 3, the dependent variable is the share of total OECD patents originating in a particular country; in this case, exemption and hybrid countries have a lower patent share. This regression was also considered without the inclusion of the United States; the exemption dummy loses its statistical significance in that case. The United States has 32 percent of OECD patents in 2006; the average (non-U.S.) OECD country has 2.3 percent of OECD patents.

In columns 4 and 5, business R&D expenditure and business R&D employment show no relation to either tax rates or tax systems. Column 6 considers an OECD data series that measures technology products balance of payments, as technology related receipts minus technology related payments. The negative coefficient on the hybrid tax system may reflect the importance of the United States, which is an outlier. If the United States is omitted from the analysis, the tax system coefficient loses statistical significance, although the tax rate is still positively associated with technology balance of payments. In 2006, the U.S. technology balance of payments was about $40 billion; for the typical OECD country, the technology balance of payments averaged about $1.5 billion.
Figure 7

Panel B: Business Sector R&D Expenditure per thousand dollars GDP

Credit Countries
Non-Credit Countries

Credit Countries
Non-Credit Countries
VII. CONCLUSION

The simple empirical investigation in this paper does not suggest a strong relationship between tax policy variables and the location of Fortune 500 firms over the period 1990–2008. Likewise, while patents are positively associated with exemption or hybrid tax system countries, two other science measures are negatively associated with exemption or hybrid system countries, implying no clear relationship between scientific prowess and tax system variables for OECD countries over the period 1985–2005.

Still, a small recent body of research sheds more light on these questions. Particularly noteworthy are the papers by Barrios et al. (2009), Huizinga and Voget (2009), Voget

<table>
<thead>
<tr>
<th>Table 4</th>
<th>Determinants of Headquarters Activities, OECD Data on Science Measures</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>ln (Patents)</td>
</tr>
<tr>
<td>exempt</td>
<td>1.323</td>
</tr>
<tr>
<td></td>
<td>(0.338)**</td>
</tr>
<tr>
<td>hybrid</td>
<td>0.788</td>
</tr>
<tr>
<td></td>
<td>(0.280)**</td>
</tr>
<tr>
<td>tax rate</td>
<td>1.574</td>
</tr>
<tr>
<td></td>
<td>(1.30)</td>
</tr>
<tr>
<td>CFC law</td>
<td>−0.046</td>
</tr>
<tr>
<td></td>
<td>(0.299)</td>
</tr>
<tr>
<td>ln(gdp)</td>
<td>1.16</td>
</tr>
<tr>
<td></td>
<td>(0.097)**</td>
</tr>
<tr>
<td>ln(gdp p.c)</td>
<td>0.934</td>
</tr>
<tr>
<td></td>
<td>(0.175)**</td>
</tr>
<tr>
<td>ln(remote)</td>
<td>−0.06</td>
</tr>
<tr>
<td></td>
<td>(0.426)</td>
</tr>
<tr>
<td>ln(bus rd)</td>
<td>1.452</td>
</tr>
<tr>
<td></td>
<td>(0.087)**</td>
</tr>
<tr>
<td>obs.</td>
<td>135</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.77</td>
</tr>
</tbody>
</table>

(2009), and Dischinger and Riedel (2009, 2010). Using very comprehensive data and a careful empirical approach, these authors identify the importance of tax incentives in multinational firm headquarters decisions.

If multinational firm headquarters are tax sensitive, tax policy should also consider whether and why multinational firm headquarters are desirable. The above discussion has illustrated a few helpful principles. First, multinational firm headquarters are an inherently ambiguous concept. Multinational firms are by their very essence international entities, and it is to be expected that they will likewise organize their headquarters activities across national boundaries. Second, multinational firms may generate positive external effects on the economy through activities that are associated with innovation, higher profits, and higher wages. Yet the theory of distortions and welfare, carefully explicated by Bhagwati (1971), has essential relevance. When possible, it is ideal to target policy goals as directly as possible, and it is unlikely that encouraging multinational firm headquarters per se is the most efficient way to encourage their associated positive external effects.

Finally, there is a strong argument for separating decisions regarding the optimal taxation of multinational firm income from the legal and financial arrangements of multinational firms. This argument grows stronger with the increasing flexibility of multinational firms in the global economy. Ideally, taxation of multinational firm income should be based as closely as possible on where the income is earned, and not on tax-motivated decisions concerning finance, legal and organizational form, or accounting. A vast body of empirical research on taxation suggests a hierarchy of behavioral responses; taxpayers are more responsive in undertaking financial or accounting responses to taxation than in their real economic decisions. In this context, international tax reform should focus on designing a system that more clearly and simply approximates the true location of multinational firm income-generating activities.

ACKNOWLEDGMENTS

Peter Merrill, Jennifer Gravelle, Dhammika Dharmapala, Daniel Shaviro, and Jack Mutti all provided useful comments on earlier versions of this work. I am grateful to Bryson Uhrig-Fox for excellent research assistance and the gathering of the *Fortune* data during his senior thesis project. I am thankful for financial support from the International Tax Policy Forum and the Bernard Goldhammer fund.

REFERENCES


APPENDIX A: DATA SOURCES

Data on both statutory tax rates and corporate tax systems are from various sources, including PricewaterhouseCoopers Corporate Taxes: Worldwide Summaries, Ernst and Young’s Worldwide Corporate Tax Guide, and Deloitte and Touche’s International Tax Source on-line. Data on CFC laws are from Voget (2009). Prior studies often classify countries as either credit or exemption countries; I also code some countries as hybrid countries. Yet even with the more refined classification, substantial ambiguities remain.

Data on GDP and GDP per-capita come from the World Bank’s World Development Indicators Database. Data on geographic distances between countries are taken from the website of Kristian Skrede Gleditsch at the University of Essex. Remoteness is defined as the average distance to other countries in the sample. While the sample itself distorts this variable, it still shows a sensible pattern in the data. For example, New Zealand is more remote than the United States, which in turn is more remote than Belgium.

Fortune Global 500 lists are available on-line for the years 2005 onward. While they have published similar lists for decades, the data since 1990 have been more consistently defined. Years prior to 2005 were collected using archived versions of the publication.

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19 This source provides matrices of country tax rates from recent history. See International Tax Source.


